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ABSTRACT

Housing equity is the principle asset of a large fraction of older Americans. Indeed many retired persons have essentially no financial assets, other than Social Security and, for some, employer-provided pension benefits. Yet we find that housing wealth is typically not used to support non-housing consumption during retirement. Based on data from the Survey of Income and Program Participation, and the Asset and Health Dynamics Among the Oldest Old, we consider the change in home equity as families age. The results are based in large part on families aged 70 and older. We find that, barring changes in household structure, most elderly families are unlikely to move. Even among movers, those families that continue to own typically do not reduce home equity. However, precipitating shocks, like the death of a spouse or entry to a nursing home, sometimes lead to liquidation of home equity. Home equity is typically not liquidated to support *general* non-housing consumption needs. The implication is that when considering whether families have saved enough to maintain their pre-retirement standard of living after retirement, housing equity should not be counted on to support general non-housing consumption. These conclusions seem to correspond closely with the results of a recent American Association of Retired Persons survey, which found that 95 percent of persons 75 and older agreed with the statement: "What I'd really like to do is stay in my current residence as long as possible."

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Housing equity is the most important asset of a large fraction of older Americans. In principle, these assets might be used to support consumption after retirement. Reverse mortgages were envisioned as a mechanism that would allow families to “consume” housing equity without selling their homes. Several earlier papers (Venti and Wise [1989 and 1990], Merrill [1984], and Feinstein and McFadden [1989]) concluded that unless there was a change in family status there was little if any reduction in housing equity as people aged. Indeed, the Venti and Wise [1989 and 1990] papers concluded that even among movers there was little change in home equity. We did find, however, that persons with large home equity relative to other wealth were more likely to reduce home equity when they moved and those with low housing equity relative to other wealth were more likely to increase home equity when they moved. Large reductions in home equity were typically associated with the death of a spouse or to other precipitating shocks. Our analyses were based on the Retirement History Survey (RHS) and covered persons in the 58 to 73 age range. Merrill [1984] also analyzed RHS data and reached conclusions consistent with ours. Feinstein and McFadden [1989] base their analysis on the Panel Survey of Income Dynamics (PSID), which includes households with heads over age 75. Their findings are also consistent with our earlier findings. In a somewhat later analysis, Venti and Wise [1991], using data from the Survey of Income and Program Participation (SIPP), also obtained findings consistent with the prior studies.

Sheiner and Weil (1993) find some decline in home equity at older ages, associated with shocks to family status and health. Their results appear to us to be consistent with the prior studies. More recently, Megbolugbe et. al. [1997], based on analysis of PSID data, find that: (1)

Home ownership rates remain high until age 70, but then a noticeable decline begins. (2) Each year 97% of owners remain owners and 91% of renters remain renters. And when they move, renters are more likely than owners to switch tenure (But renters are more likely to move, so on net there is a trend to renting). (3) When they move: owners aged 55-64 are more likely to trade down, owners aged 65-74 are more likely to trade up, and those 75+ are as likely to trade up as down. (4) Liquidity constraints (e.g. asset-rich but income-poor) don't matter. In fact they find that asset-rich but income-poor households tend to trade up, in contrast to earlier findings. Hurd [1999], on the other hand, based on the first two waves of the Asset and Health Dynamics Among the Oldest Old (AHEAD) survey, concludes: "These results suggest that downsizing of home owning is the norm, and that prior contradictory findings were due to inadequate data."

In this paper we return to analysis of change in home equity as persons age. The key question is whether housing wealth is typically used to support the general consumption of older persons as they age. We give particular attention to older households—from ages 70 to 90—using data from AHEAD.

To the extent that housing equity is used just like financial assets to support consumption after retirement, then it might also be considered as a substitute for financial wealth and perhaps treated interchangeably with financial wealth in considering the well-being of the elderly. On the other hand, if housing wealth is not drawn down with age, it may be more realistic to treat non-housing consumption as destined to come largely from accumulated financial wealth, including Social Security and other annuities. Analysts considering how well households are prepared for retirement have treated home equity in different ways: Moore and Mitchell [2000] include housing wealth in the set of assets that can be used to finance retirement. The Congressional Budget Office [1993] also includes housing wealth with other wealth. On the

other hand, Bernheim [1992] in considering “Is the Baby Boom Generation Preparing Adequately for Retirement” excluded housing wealth in making a determination. Engen and Gale [1999] make calculations including 0 percent, 50 percent, and 100 percent of housing equity. Gustman and Steinmeier [1999] conduct analyses using 0 percent and 100 percent of home equity.

We consider first the relationship between age and housing equity over the life cycle, based on data from the Survey of Income and Program Participation (SIPP). The results are based on cohort analysis and are presented graphically. We then turn to more detailed analysis for older households, based on the AHEAD data. In particular we consider the effect of precipitating shocks. We find that on average the reduction in housing equity is very small for persons who continue to own homes, even as they age through their eighties and even into their nineties. We find that among homeowners 94.7 percent of the two-person households and 89 percent of the one-person households do not move between the waves. For these households -- except for changes in market values -- there is no change in housing equity. There are sharp reductions in the housing equity of some of the households facing precipitating shocks. For example, among two-person households that own homes in which a member dies, about 10% terminate ownership and mean home equity falls by about \$70,000 for households that those that begin to rent and by \$110,000 for households that shift to an alternative living arrangement. However, these households account for only about 1.5 percent of all two-person households that own homes. Similarly, if a family member enters a nursing home, home equity falls by about \$50,000 among those who subsequently rent and by \$100,000 among those who subsequently choose some other arrangement. Again, only a small fraction of households that own move to a nursing home is low - these households only account for about one percent of all two-person

households that own homes. Similar results pertain to one-person households. In these cases, home equity may be used to pay medical expenses or indeed to support more general consumption of a surviving spouse, although we have not attempted here to document such expenditures. In general, we see very little reduction in home equity that can be construed as converting home equity to liquid assets for the purpose of supporting non-housing consumption.

Potential misreporting and errors in the AHEAD data may be an important caveat to our results. We have given considerable attention to these issues, but we are left with substantial noise in changes in housing wealth, particularly when persons move. Indeed, the reduction in housing wealth calculated from the difference between self-reported owner-occupied home value before sale and, presumptively, the reported sale value after moving may exaggerate to a considerable degree the actual reduction in housing equity. There is substantial evidence that respondents tend to overestimate the value of the house in which they are living.

HOME EQUITY OVER THE LIFE CYCLE: SIPP COHORT DATA

Home Ownership. The SIPP provide housing equity (obtained from home value and mortgage debt) data for seven years - 1984, 1985, 1987, 1988, 1991, 1993 and 1995.¹ From the random

¹The survey panels and wave that provide the data are as follows:

Panel	Wave	Dates in Field
1984	4	Sept-Dec 1984
1984	7	Sept-Dec 1985
1985	3	Sept-Dec 1985
1985	7	Jan-Apr 1987
1986	4	Jan-Apr 1987
1986	7	Jan-Apr 1988
1987	4	Feb-May 1988
1990	4	Feb-May 1991
1991	7	Feb-May 1993
1992	4	Feb-May 1993
1993	7	Feb-May 1995

sample of cross-section data in each of these years we have created cohort data. For example, to trace the home equity of persons who were age 26 in 1984, we begin with the average home equity of persons age 26, based on the random sample of persons age 26 in 1984 survey. Next we obtain the average equity of persons age 27 from the 1985 survey, age 29 in the 1987 survey, and so forth. We identify cohorts by their age in the 1984 survey. We do this for 17 cohorts defined by the age of the cohort in the first year of the data. In fact, to obtain more precise estimates of housing equity, the data for a cohort, like age 26, is the average of data for a three-year age interval –25, 26, and 27. We do this for cohorts, age 26, 29, ..., 71, 74. All cohorts are followed until age 80 in the SIPP.²

Figure 1 shows the percent of two-person households who own a home, by cohort. These data can be affected by differential mortality. For example, suppose that homeowners were less likely to die at any age than renters. In this case, the ownership rate would be increased with age simply because the owners lived and the renters died. To account for this possibility, we made a mortality correction to the data, which is explained in the appendix. The mortality-corrected data for two person households are shown in Figure 1. To make the figure easier to read, only selected cohorts are shown. The key message of the figure is that home ownership does not decline with age, through age 79. In addition, there appear to be no important cohort effects until about age 70. That is, there are not large jumps when the data for one cohort ends and the data for another cohort begins. At older ages, however, there do appear to be noticeable cohort effects. Home ownership is lower for the last two cohorts. But like the trends for the other cohorts, there is no evident decline in ownership as these cohorts age.

Figure 2 pictures the result of “smoothing” the data by regressing home ownership on

² Data for households over age 80 are not used because age is top coded at 80.

age, age squared, and age cubed, together with cohort effects. The functional form is

$$Own = \alpha + \beta_1 A + \beta_2 A^2 + \beta_3 A^3 + \sum_{cohort} \delta_i C_i$$

where i indexes cohorts and δ_i indicates the i th cohort effect. In this estimation, the sum of the δ_i s is zero. In Figure 2, the “average” relationship between age and ownership, based on the age parameters in the above equation, is shown by the heavy solid line. The cohort effects are represented by the deviations of individual cohort lines from the overall average. These more formal estimates indicate that both the oldest and the youngest cohorts are less likely than the average to own, while the middle-aged cohorts are more likely to own.

Home ownership data for one-person households are shown in Figure 3. Again there is no apparent decline in ownership with age. Indeed, the data seem to show some increase in ownership at the oldest ages.

Home Equity. The raw home equity data for two-person families are shown in Figure 4. These data, however, are in current dollars and thus reflect the influence of rising home prices over the 1984 to 1995 period. Nor are the data corrected for differential mortality. The same data, all in 1995 dollars and corrected for mortality are shown in Figure 5. Within cohorts, the data again show no decline in home equity as the cohort ages. The data may even show some increase in equity within cohorts for ages 65 to 80. There do appear to be some cohort effects in equity, as evidenced by the jumps when the data for one cohort ends and the data for another cohort begins.

To illustrate more clearly the cohort effects, we have fit the cohort data with a regression equation just like the one above, but replacing home ownership with home equity:

$$Equity = \alpha + \beta_1 A + \beta_2 A^2 + \beta_3 A^3 + \sum_{cohort} \delta_i C_i$$

The results for selected cohorts are shown in Figure 6 and the results showing all of the cohorts are shown in Figure 7. It is clear that both older cohorts—those over age 70 in 1984—and younger cohorts—those younger than 36 in 1984—have lower home equity than the average, while the middle-aged cohorts have higher equity than the average. For example, consider cohorts who attained age 32 in successively later calendar years: The cohort that was age 32 in 1984 had more home equity than the cohort aged 32 in 1988, and the later cohort had more home equity than the cohort that attained age 32 in 1995. We have not tried to analyze the reasons for the cohort effects in any systematic way, although initial analysis suggests that differences in housing price changes over time may be the principle determinant of the cohort effects.³⁾

Figure 8 shows the raw equity data for one-person households and Figure 9 shows the data corrected for mortality and inflation. As with the two-person households, there seems to be no decline in equity through age 78.

HOME EQUITY AT OLDER AGES: AHEAD COHORT DATA

To understand trends in home equity at older ages, we use the AHEAD data. Again, we consider home ownership cohort data first and then home equity cohort data. Then we consider the effect of precipitating shocks that are strongly related to change in home equity at older ages.

³For example, referring to Figure 5, assume that homes are bought at age 35 on average, and consider the cohort that was age 50 in 1984 compared to the cohort that was age 38 in 1984. The older cohort bought homes in 1969 on average and would have gained from large home price increases in the 1970s. On the other hand, the younger cohort would have bought homes in 1981 on average and would have seen much lower increases in home equity during the 1980s and 1990s.

Home Ownership. AHEAD is a panel data file that follows the same families over time. We use data from wave 1 (1993) and wave 2 (1995) of AHEAD. These same households were resurveyed in wave 4 of the Health and Retirement Study (HRS) in 1998. Thus we have three data points spanning five years for each household. To present cohort data comparable to the SIPP, we construct cohorts data by grouping households in two-year age intervals. These constructed cohorts are the basis for the cohort data shown below.

The home ownership cohort data for two-person families are shown in Figure 10, which covers ages from 70 to 90. A comparison of these data with the SIPP data in Figure 1 shows that the ownership percent for two-person families in their early 70s is about 90 percent in both sources. But the AHEAD data suggest a modest decline in ownership among persons in their 70s. At older ages, however, the within cohort data do not show a decline in ownership, although the data do suggest cohort effects, with lower ownership among the oldest cohorts.

Analogous data for one-person households are shown in Figure 11. For these households the within cohort data do suggest a decline in ownership as persons age. But the data also suggest a positive cohort effect, with higher ownership among households in their eighties than among those in their late 70s.

Home Equity. CPI adjusted home equity cohort data for two-person households are shown in Figure 12. The data show a rather consistent decline in housing equity, with no substantial cohort effects. The anomalous age 82 cohort data is apparently the result of a small sample. The equity data for one-person households are shown in Figure 13 and also show consistent decline with age, and without noticeable cohort effects, with the possible exception of the oldest cohort.

Putting together the SIPP and the AHEAD data for two-person households in Figures 5 and 12 respectively, a tentative conclusion is that home equity seems to peak in the early 60s and remain more or less constant until the early 70s. Thereafter, there may be some modest decline in equity. For one-person households, mentally piecing together Figures 9 and 13, the evidence is similar, although the decline in the mid 70s seems somewhat larger and perhaps more consistent.

CHANGE IN FAMILY STATUS AND HOME EQUITY: AHEAD

Details of the Data. We begin with rather detailed tables showing change in home ownership, by initial ownership status and by change in family status. Again we consider two- and one-person households separately. To illustrate the setup of the lengthy tables, the first panel of the ownership table for two-person households (Appendix Table 1a) is shown in Table 1.

We consider changes in ownership during the 1993-95 interval and the 1995-98 interval. Data from both periods are combined in the table. Separate analyses for each of the two intervals revealed similar results. The data shown in Table 1 pertain to two-person families who were initial homeowners at the beginning of the periods. (We have not made a correction for the different lengths of the periods. If people who own at the beginning of a period are equally likely to move in any of the next few years, then more people would have moved during the three-year than during the two-year period. Thus on average these are move rates over a 2½ year period.)

Of all two-person households at the beginning of the period, 87.8 percent owned homes. Of the initial owners, most still owned a home at the end of the period--94.7 percent; 1.9 percent were renting by the end of the period, and 3.5 percent had some other living arrangement. The

Table 1. AHEAD: Transitions by initial ownership and family status change, 1993-95 and 1995-98 changes combined.*

Initial Status & Change		Subsequent Status				Percent Onwership & Change	
		Own		Rent			Other
Own		Two-Person Households at Beginning of Interval					
		94.7		1.9		3.5	87.8
2 to 2		96.6		1.5		1.9	82.4
	Stay		95.6		25		78
	Move		4.4		75		22
			100		100		100
2 to 1		89.6		3.2		7.2	14.8
	Stay		92.4		13.3		41.2
	Move		7.6		86.7		58.8
			100		100		100
2 to NH		66.3		4.5		29.2	2.8
	Stay		89.8		25		0
	Move		10.2		75		100
			100		100		100

*This is the first panel from Appendix Table 1a.

Source: Authors' calculations from AHEAD and HRS data.

remainder of the panel shows transitions by family status change. For example, consider two person households at both the beginning and the end of the period (2 to 2 households, representing 82.4 percent of initial owners): 96.6 percent still owned at the end of the period. Of the 96.6 percent, 95.6 percent were still in the same home, while 4.4 percent had moved to a different house. A small portion of the continuing homeowner two-person households (1.5 percent) were renting at the end of the period. Of this group, 25 percent were still living in the same house. Perhaps the home had been transferred or sold to children.

The remainder of the panel shows the changes of households that experienced shocks to

family status. The rows labeled “2 to 1” pertain to households that had two members in the initial period and one member in the subsequent period. The rows labeled “2 to NH” include all households with two members in the initial period and at least one member in a nursing home in the subsequent period. Households that changed from two- to one-person were more likely to change ownership: 89.6 percent still owned at the period end, but 3.2 percent were renting, and 7.2 percent had some other living arrangement. Most of these were living with children. The third family status change is from a two-person household to a nursing home for at least one member of the household at the end of the interval. Of these households, only 66.3 percent were still owners, 4.5 percent were renting, and 29.2 percent had another living arrangement.

Appendix Table 1a shows comparable data for renter households at the beginning of the period, and for those with other living arrangements at the beginning of the period. Appendix Table 1b shows these data for one-person households at the beginning of the period. Even among one-person households, 61.7 percent were homeowners at the beginning of the period. And 91 percent of the continuing one-person households still owned at the end of the period. Of the 4 percent of one-person households with a nursing home transition, only 41.8 percent still owned a home: 3.5 percent were renting and 54.6 percent had some other living arrangement.

Both tables show that most moves are associated with a precipitating shock -- the death of a spouse or with entry to a nursing home.

The changes in home equity that parallel the changes in ownership are shown in detail in Appendix Tables 2a, which shows means, and 2b, which shows medians. All figures are in 1995 dollars. Again to explain the tables, the first panel of Appendix Table 2a is reproduced in Table 2 .

Table 2. AHEAD: Mean change in home equity by initial ownership and family status change, 1993-95 and 1995-98 changes combined.*

		Subsequent Status				Initial Home
		Own	Rent	Other	All	Equity
Two-Person Households in at Beginning of Interval						
Own					-3603	110524
2 to 2		2026	-73011	-78488	-553	110165
	Stay	2516	-61231	-82869	936	109456
	Move	-9179	-77303	-57989	-26093	122371
2 to 1		-10233	-68639	-108295	-18633	113755
	Stay	-10113	-18616	-124546	-13668	112622
	Move	-11598	-71795	-97261	-48138	120393
2 to NH		4834	-49118	-102827	-24545	119020
	Stay	4678	-79207		4005	112816
	Move	6253	-45441	-102827	-75104	92461

*This is the first panel of Appendix Table 2a.

Source: Authors' calculations from AHEAD and HRS data.

The last column shows the mean initial housing equity for each of the transition groups. The average for all initial homeowners was \$110,534. The average decline over the intervals was \$3,603. This decline represents about 15 percent of the average income of these households and about 3.4 percent of their non-housing wealth.

Consider first the upper left portion of the table, which pertains to two-person households that owned at the beginning and the end of the interval. On average, their housing equity increased by about \$2,000, accounted for by those who stayed in the same home. Movers reduced their home equity by \$9,179. This is about 7.5 percent of their average initial home value of \$122,371. (Remember, the typical household will only move once, so the reduction is a one-time reduction. These data suggest that in evaluating the change in the home value of

movers, one might use the change for stayers as a control, suggesting that in this case movers actually reduce home equity by \$11,695. We in fact make such comparisons more formally below. But we also emphasize below that the reduction in home equity when people move is likely to be exaggerated.

It is clear from this table that moves associated with changes in household structure produce large changes in home equity. The data also show a reduction in the home equity of stayers who changed from a two- to a one-person household. It is likely that this change represents some random misreporting, perhaps because the more knowledgeable respondent is no longer in the household.

The remainder of Appendix Table 2a shows comparable data for initial renters and for those with other housing. Appendix Table 2b shows the data for one-person households. Appendix Tables 3a and 3b are the same as Appendix Tables 2a and 2b, but report medians instead of means. The first panel of Appendix Table 3a is reproduced in Table 3 below.

We believe there are many errors in the data and the medians tend to lessen the influence of outlier responses. (In addition of course, the medians may be different from the means simply because of the shape of the distributions of accurately reported data.) In some cases there are large differences between the medians and the means. For example, the median reduction for continuing owners who move is \$5,294, instead of \$9,179. The overall reduction for continuing two-person households who moved is \$12,805, instead of \$26,093. The reduction for all initial owners is \$2,540 instead of \$3,603.

Before turning to some simple estimation, we emphasize that reporting errors are likely to yield exaggerated reductions in housing equity when homeowners move. There is a substantial housing literature that concludes that homeowners overestimate the value of their homes

Table 3. AHEAD: Median change in home equity by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

		Subsequent Status				Initial Home
		Own	Rent	Other	All	Equity
Two-Person Households in at Beginning of Interval						
Own					-2540	84488
2 to 2		-1488	-60000	-58085	-2165	84488
	Stay	-1402	-66534	-63366	-1963	84488
	Move	-5294	-60000	-57029	-12805	100000
2 to 1		-490	-52805	-79207	-3984	80000
	Stay	83	-12000	-68646	-841	80000
	Move	-24589	-52805	-85000	-47212	85000
2 to NH		-7012	-47524	-84488	-12573	73297
	Stay	-7012	-79207		-7012	75000
	Move	4623	-47524	-84488	-50693	68646

*This is the first panel from Appendix Table 3a.

Source: Authors' calculations from AHEAD and HRS data.

(surveyed by Kiel and Zabel [1999]). The realized sale price of a home is typically less than the prior estimated home value. This creates a bias in our estimate of the *change* in housing equity among movers. The pre-move estimate is inflated. The post-move price is presumably more accurate since the purchase transaction was recently completed.

Selected data in AHEAD, as well as the Health and Retirement Survey (HRS) shows this tendency. In AHEAD2 (1995) and HRS4 (1998) widows were asked if they sold their home since the last interview. If so, they were asked for the selling price. If, as we expect, the recent sale price is accurately reported, then the difference in the pre-sale estimated value and the post-sale price is a measure of how much persons “overestimate” housing values. The estimated home values and the reported sale prices for these widows are reported below:

Comparison of Estimated Home Values and Sale Prices

Survey Interval and Sample Size	Mean Estimate of Home Value in Initial Survey Year	Mean Reported Sale Price in Next Survey Year	Difference
1993-1995 N = 152	90,512	80,816	-9,696
1995-1998 N = 178	123,672	111,043	-12,630

Apparently these households overestimated their home values by about 10 percent. If this is more generally true, our estimates of the reduction in home equity when a home is sold could be overestimated by as much as \$10,000 to \$12,000. Indeed the reduction in mean housing equity when continuing two-person households move from one home to another (-\$9,179 in Appendix Table 2a) could be completely explained by exaggeration of the initial home value.

More Formal Estimates of Change in Home Equity . We consider again the change in home equity of movers and stayers. As mentioned above, one way to think about this is to treat movers as the treatment group and stayers as the “control” group. In this case, the home equity of stayers and movers at the beginning and at the end of the interval can be represented by:

	Beginning	End
Stayers	α	$\alpha + t$
Movers	α	$\alpha + t + m$

In this case, a difference-in-difference estimate $[(\alpha + t + m - \alpha) - (\alpha + t - \alpha) = m]$, yields the

“treatment” effect m . We can estimate m for all households combined, or for any subgroup, by

$$\Delta E = t + mM$$

where t is a constant term and represents a time (inflation) effect and m is the additional effect for movers, with M a dummy variable identifying movers. The same equation can be estimated for any subgroup using the specification

$$\Delta E_k = (t_k + m_k M) * D_k$$

where the dummy variables D represent different changes in family status and home ownership.

Estimates obtained in this way, are shown in Table 4. This table presents estimates for initial (at the beginning of the interval) homeowners only. Data are presented by the subsequent (at the end of the interval) status of the initial homeowners. OLS estimates are shown in the left portion of the table. The right portion shows median regression estimates. These estimates are not affected as much as OLS estimates by reporting errors or other outliers in the data. In either case, the change in equity of movers is likely to be overestimated because of the inflated assessment of home values, as explained above.

For all two-person homeowner stayers the change in home equity was not significantly different from zero based on the OLS estimates, but the median regression estimates suggest that home values fell somewhat during the intervals. For continuing homeowners, the OLS estimates show no statistically significant reduction in home equity, even for movers (with the exception of the anomalous fall in the reported value of stayer households whose family status changed from two to one). The median results show some significant, but smaller declines. Accounting for the tendency to overestimate the value of owner-occupied housing, it is likely that continuing owners--even movers--had no decline in housing value, and may indeed have increased housing equity. Recall that the results for widows above suggest that the method used here may

exaggerate the decline in equity by \$10,000 to \$12,000 dollars.

The important declines in home equity occur among the 1.9 percent of two-person families who switch from owning to renting and the 3.5 percent who switch from owning to some other living arrangement. First, none of the “mover” effects for those who switch from owning to renting or other are significantly different from zero. This suggests that there is no difference in the reduction in housing equity between the movers and the stayers. The anomaly in the AHEAD data is that nearly 25 percent (see Appendix Table 1a) of those who are reported to switch from owning to renting are also reported to be stayers—that is they would appear to be new renters who haven’t moved from their initial home. Further, the housing equity of all the new renters who are “stayers” is reduced by around \$60,000, estimated by both OLS and median regression.

Given the apparent anomalies in the data, we put little faith in the “control” method results reported here, but we do tentatively conclude that those who switch from owning to renting reduce home equity by about \$60,000, which is consistent with the values reported in Appendix Tables 2a and 2b as well. In subsequent analysis we will attempt to determine whether the reduction in home equity of either “stayers” or “movers” show up as an increase in other assets.

Similar anomalies show up in the data for those who switch from owning a home to some other living arrangement. We only conclude tentatively that housing equity is reduced by somewhere between \$60,000 and \$100,000 dollars for this group.

Comparable estimates for single persons suggest that the housing equity of stayers was reduced by \$2,000 to \$4,000. Contrary to national data on home values, these estimates imply that home values declined over the survey intervals. On average, the 11 percent of one-person

Table 4. Estimates of mover equity effect using stayers as the “control” group, for initial homeowners, for two- and one-person households, by estimation method.

Subsequent ownership and family status change	OLS estimates				Median regression estimates			
	stayers		movers		stayers		movers	
	<u>coef</u>	<u>t-stat</u>	<u>coef</u>	<u>t-stat</u>	<u>coef</u>	<u>t-stat</u>	<u>coef</u>	<u>t-stat</u>
Two-Person Households at Beginning of Interval								
All	-807	0.2	-37217	2.8	-2012	4.6	-26832	17.5
Own at End of Interval:								
All	1020	0.3	-10085	0.6	-1534	3.3	-5710	2.8
2 to 2	2516	0.6	-11696	0.5	-1402	2.9	-3892	1.7
2 to 1	-10113	2.1	-1485	0.1	82.7	0.1	-24672	4.4
2 to N	4678	0.4	1574	0.1	-7012	2.7	11635	1.7
Rent at End of Interval:								
All	-58935	3.9	-14424	0.9	-66534	3.8	7534	0.4
2 to 2	-61231	3.6	-16072	0.8	-66534	3.5	6534	0.3
2 to 1	-18616	0.3	-53179	0.9	-12000	0.6	-40805	1.8
2 to N	-79207	1.8	33766	0.7				
Other at End of Interval:								
All	-92279	6.9	-536	0.0	-63366	8.2	-11634	1.1
2 to 2	-82869	5.7	24880	0.7	-6366	4.9	6337	0.2
2 to 1	-124546	3.8	27285	0.6	-68646	3.2	-16354	0.6
2 to N	-102827	5.9			-84488	5.5		
One-Person Households at Beginning of Interval								
All	-3975	2.8	-52748	12.3	-2131	6.1	-40369	38.2
Own at End of Interval:								
All	-341	0.2	-8625	1.3	-1262	3.0	1509	0.8
1 to 1	-274	0.2	-8602	1.3	-1122	2.9	1368	0.4
1 to N	-3291	0.5	-11877	0.3	-3131	0.7	-19442	1.5
Rent at End of Interval:								
All	-56260	6.1	-18554	1.7	-58085	3.8	-1915	0.1
1 to 1	-57928	6.1	-16097	1.4	-60000	4.0	0	0
1 to N	-25488	0.7	-81329	1.7	-19010	0.3	-135990	1.7
Other at End of Interval:								
All	-77452	10.1	-14166	1.4	-63366	10.3	-5280	0.6
1 to 1	-78111	9.3	-32055	2.4	-65000	10.8	-8927	0.9
1 to N	-33596	0.8	-39659	0.9	-25000	1.2	-38366	1.8

Source: Authors' calculations from AHEAD and HRS data.

households who moved reduced housing equity by approximately \$40,000 to \$50,000. Accounting for the overestimation in the self-reported value of owner-occupied housing, these reductions would be less. Like two-person households, one-person households do not typically reduce home equity if they continue to own. Indeed, for continuing owners, none of the move effects are significantly different from zero. As with two-person households there appear to be many anomalies in the data for those who report switching from homeowners to renting or to “other.”

CONCLUSIONS

We have considered the change in home equity as families age. We find that, barring changes in household structure, elderly families are unlikely to discontinue home ownership—only about 5.4 percent of two-person households that own change status in a two and one-half year period. Even among movers who continue to own, we judge that there is essentially no reduction in mean home equity, accounting for the exaggeration in initial home value. Liquidation of home equity is more likely in the face of precipitating shocks, experienced by about 18 percent of AHEAD two-person families over a two and one-half year period. When a spouse dies, about 10 percent of these households discontinue home ownership; about 35 percent discontinue home ownership when a spouse enters a nursing home. The reduction in home equity among these families that discontinue ownership is about \$60,000 or \$70,000. Mean home equity among all families that experience these shocks is over \$110,000. Thus we conclude that home equity is typically not liquidated to support *general* non-housing consumption needs. While the results presented here are based in large part on the home equity

of families aged 70 and older, the results are much like those reported in earlier work, including our own, which was based largely on families under age 75.

The results suggest to us that in considering whether families have saved enough to maintain their pre-retirement standard of living after retirement, housing equity should not be counted on to support general non-housing consumption. Families apparently do not intend to save for retirement through investment in housing, as they might through a 401(k) plan or through some other financial form of saving. Rather the findings here, as well as our earlier findings, indicate that families purchase homes to provide an environment in which to live, even as they age through retirement years. It may be appropriate, however, to think of housing as a reserve or buffer that can be used in catastrophic circumstances that result in a change in household structure.

These conclusions correspond closely to the findings of a recent survey of older households sponsored by the American Association of Retired Persons (AARP). Respondents were asked "Do you agree with the statement: 'What I'd really like to do is stay in my current residence as long as possible'." The percent indicating that they "strongly agree" or "somewhat agree" are:

<u>Age</u>	<u>Percent Agree</u>
45_54	75%
55_64	83%
65_74	92%
75+	95%

In addition, nearly three-fourths of the respondents age 55+ think that their current residence is where they will always live. When asked what they would prefer to do if they eventually needed help caring for themselves, they responded:

<u>Option</u>	<u>Percent Selecting</u>
---------------	--------------------------

Have help given at current home	82%
Move to a facility where care is given	9%
Move to a relative's home	4%
Other	4%

Like our findings, the results of the AARP survey also imply that most households do not intend to liquidate housing equity to support retirement consumption.

Even in the face of precipitating shocks, when home equity is sometimes liquidated, we have yet to determine how the funds from the sale of a home are used. Do funds show up as an increase in financial assets? Are the assets transferred to children? How much is used to support general consumption? How much goes to nursing home expenses or costs associated with the death of a spouse? We will return to these issues in subsequent work.

APPENDIX: MORTALITY CORRECTION

The analyses using the SIPP data are based on cohorts constructed from cross-section surveys. For example, the home ownership (or home equity) profile for a cohort is constructed by combining data for all households age A in the first survey year with data for households age $A+T$ from a survey T years later. If the likelihood of survival from A to $A+T$ is related to wealth, then these cohort profiles can be affected by differential mortality. We correct for this problem by reweighting the sample. Households are assigned an adjusted weight that is inversely related to the probability of survival from age A to age $A+T$.

Baseline estimates of these survival probabilities for one and two person households are obtained from waves 1 and 2 of AHEAD. A one-person household “survives” if the person is present in waves 1 and 2. A two-person household “survives” if both members are present in the second wave. Survival probabilities are estimated from the AHEAD for five year age intervals

and for housing equity quartiles. Households that are older and households that have lower levels of housing wealth are less likely to survive. Since the AHEAD only includes households age 70 and over, published survival rates by age (from the NCHS) were used to extrapolate the AHEAD survival probabilities back to age 50.

The final step is to reweight the data. For each household observation of age A and housing equity quartile Q , the SIPP frequency weight is multiplied by the inverse of the cumulative survival probability. The survival probabilities are assumed to be one for households less than age 50. Thus households that are unlikely to survive are given higher weights. For each observation the probability of surviving to age A given equity quartile Q is

$$S(A, Q) = \prod_{a=50}^A s(a, a+1; Q)$$

where $s(a, a+1; Q)$ is the one-year survival rate for a household in equity quartile Q . For each household in each year the SIPP frequency weight is multiplied by the inverse of $S(A, Q)$.

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Appendix Table 1a. AHEAD: Transitions by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

Initial Status & Change		Subsequent Status					Percent Ownership & Change
		Own		Rent		Other	
Two-Person Households at Beginning of Interval							
Own		94.7		1.9		3.5	87.8
2 to 2		96.6		1.5		1.9	82.4
	Stay		95.6		25	78	
	Move		4.4		75	22	
			100		100	100	
2 to 1		89.6		3.2		7.2	14.8
	Stay		92.4		13.3	41.2	
	Move		7.6		86.7	58.8	
			100		100	100	
2 to NH		66.3		4.5		29.2	2.8
	Stay		89.8		25	0	
	Move		10.2		75	100	
			100		100	100	100
Rent		7.1		81.5		11.4	9
2 to 2		6.3		86.3		7.5	74.1
	Stay		73.3		88.9	77.8	
	Move		26.7		11.1	22.2	
			100		100	100	
2 to 1		12.9		77.4		9.7	19.1
	Stay		37.5		87.5	50	
	Move		62.5		12.5	50	
			100		100	100	
2 to NH		0		40.9		59.1	6.8
	Stay				88.9	7.7	
	Move				11.1	92.3	
					100	100	100
Other		27.7		15.1		57.1	3.3
2 to 2		32.1		15.4		52.6	65.5
	Stay		88		91.7	100	
	Move		12		8.3	0	

2 to 1		21.9	100	15.6	100	62.5	100		26.9
	Stay		85.7		60		90		
	Move		14.3		40		10		
			100		100		100		
2 to NH		11.1		11.1		77.8			7.6
	Stay		100		0		28.6		
	Move		0		100		71.4		
			100		100		100	100	100
Source: Authors' calculations from AHEAD and HRS data.									

Appendix Table 1b. AHEAD: Transitions by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

Initial status and change	Subsequent Status						Percent Onwership & Change
	own		rent		other		
One-Person Households at Beginning of Interval							
Own		89		3.3		7.7	61.7
1 to 1		91		3.3		5.7	96
	Stay		95.4		34.2		60.5
	Move		4.6		65.8		39.5
			100		100		100
1 to NH		41.8		3.5		54.6	4
	Stay		96.6		60		2.6
	Move		3.4		40		97.4
			100		100		100
Rent		2.5		81.2		16.3	26.4
1 to 1		2.6		88.9		8.5	90.1
	Stay		69.4		88.4		66.4
	Move		30.6		11.6		33.6
			100		100		100
1 to NH		1.3		11.3		87.3	9.9
	Stay		50		88.2		1.5
	Move		50		11.8		98.5
			100		100		100
Other		16		13		70.9	11.9
1 to 1		17		14.4		68.5	89.4
	Stay		93.3		71.6		87.3
	Move		6.7		28.4		12.7
			100		100		100
1 to NH		6.9		1.4		91.7	10.6
	Stay		80		100		1.5
	Move		20		0		98.5
			100		100		100
Source: Authors' calculations from AHEAD and HRS data.							

Source: Authors' calculations from AHEAD and HRS data.

Appendix Table 2a. AHEAD: Mean change in home equity by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

		Subsequent Status				Initial Home
		Own	Rent	Other	All	Equity
Two-Person Households at Beginning of Interval						
Own					-3603	110524
2 to 2		2026	-73011	-78488	-553	110165
	Stay	2516	-61231	-82869	936	109456
	Move	-9179	-77303	-57989	-26093	122371
2 to 1		-10233	-68639	-108295	-18633	113755
	Stay	-10113	-18616	-124546	-13668	112622
	Move	-11598	-71795	-97261	-48138	120393
2 to NH		4834	-49118	-102827	-24545	119020
	Stay	4678	-79207		4005	112816
	Move	6253	-45441	-102827	-75104	92461
Rent					5061	29
2 to 2		60414	0	0	4532	38
	Stay	50549	0	0	3328	0
	Move	87869	0	0	11390	244
2 to 1		56254	0	0	8451	0
	Stay	13594	0	0	727	0
	Move	71737	0	0	31332	0
2 to NH			0	0	0	0
	Stay		0	0	0	0
	Move			0	0	0
Other					22051	588
2 to 2		86949	0	0	25238	874
	Stay	93993	0	0	25670	557
	Move	16706	0	0	12931	9904
2 to 1		73641	0	0	18077	0
	Stay	81420	0	0	19629	0
	Move	30369	0	0	8297	0
2 to NH		12500		0	1103	0
	Stay	12500		0	3638	0
	Move			0	0	0

Source: Authors' calculations from AHEAD and HRS data.

Source: Authors' calculations from AHEAD and HRS data.

Appendix Table 2b. AHEAD: Mean change in home equity by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

		Subsequent Status			Initial Home	
		Own	Rent	Other	Equity	
One-Person Households at Beginning of Interval						
Own					-9691	97694
1 to 1		-674	-69432	-90569	-8231	98611
	Stay	-274	-57927	-78111	-3948	98060
	Move	-8876	-74025	-110166	-52328	104378
1 to NH		-4317	-68792	-72348	-44978	75153
	Stay	-3921	-25488	-33596	-5502	75165
	Move	-15798	-106817	-73255	-72745	75145
Rent					1501	0
1 to 1		58523	0	0	1530	0
	Stay	56818	0	0	1146	0
	Move	61792	0	0	3737	0
1 to NH		93444	0	0	1231	0
	Stay	80000	0	0	3544	0
	Move			0	938	0
Other					9658	0
1 to 1		65827	0	0	10594	0
	Stay	66356	0	0	11855	0
	Move	55780	0	0	3111	0
1 to NH		37920		0	1803	0
	Stay	43387		0	28215	0
	Move	7008		0	53	0

Source: Authors' calculations from AHEAD and HRS data.

Source: Authors' calculations from AHEAD and HRS data.

Appendix Table 3a. AHEAD: Median change in home equity by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

		Subsequent Status				Initial Home
		Own	Rent	Other	All	Equity
Two-Person Households at Beginning of Interval						
Own					-2540	84488
2 to 2		-1488	-60000	-58085	-2165	84488
	Stay	-1402	-66534	-63366	-1963	84488
	Move	-5294	-60000	-57029	-12805	100000
2 to 1		-490	-52805	-79207	-3984	80000
	Stay	83	-12000	-68646	-841	80000
	Move	-24589	-52805	-85000	-47212	85000
2 to NH		-7012	-47524	-84488	-12573	73297
	Stay	-7012	-79207		-7012	75000
	Move	4623	-47524	-84488	-50693	68646
Rent					0	0
2 to 2		23361	0	0	0	0
	Stay	18689	0	0	0	0
	Move	118673	0	0	0	0
2 to 1		51394	0	0	0	0
	Stay	2336	0	0	0	0
	Move	65000	0	0	0	0
2 to NH			0	0	0	0
	Stay		0	0	0	0
	Move			0	0	0
Other					0	0
2 to 2		51301	0	0	0	0
	Stay	51301	0	0	0	0
	Move	10466	0	0	10466	0
2 to 1		82230	0	0	0	0
	Stay	82230	0	0	0	0
		30369	0	0	0	0
2 to NH		12500		0	0	0
	Stay	12500		0	0	0
	Move			0	0	0

Source: Authors' calculations from AHEAD and HRS data.

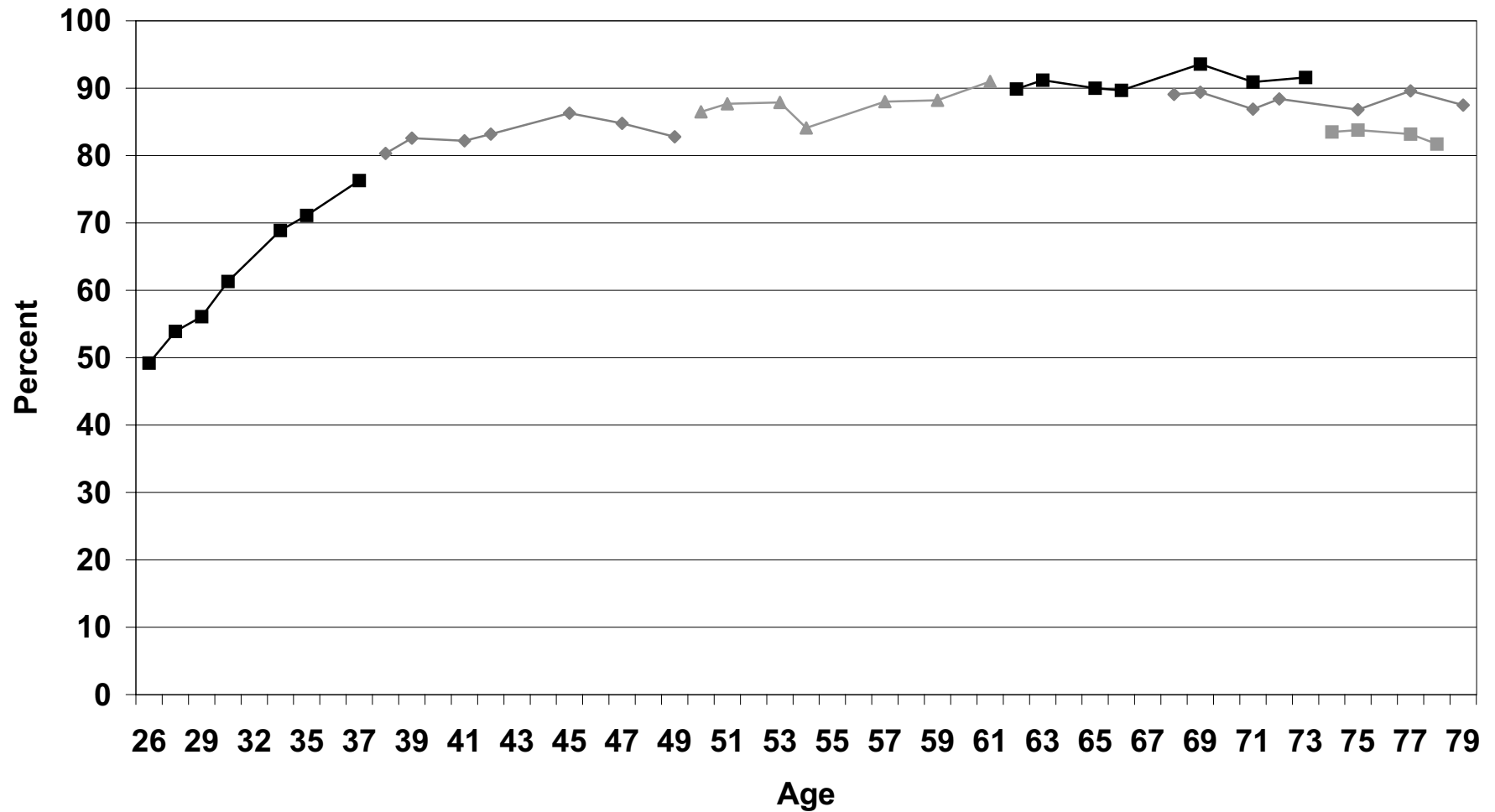
Source: Authors' calculations from AHEAD and HRS data.

AppendixTable 3b. AHEAD: Median change in home equity by initial ownership and family status change, 1993-95 and 1995-98 changes combined.

		Subsequent Status				Initial Home
		Own	Rent	Other	All	Equity
One-Person Households at Beginning of Interval						
Own					-3089	73000
1 to 1		-1122	-60000	-70000	-2623	73297
	Stay	-1122	-60000	-65000	-2098	73297
	Move	246	-60000	-73297	-34927	73297
1 to NH		-4488	-42500	-60000	-36146	63366
	Stay	-3131	-19010	-25000	-5561	65000
	Move	-22573	-155000	-63366	-63366	63366
Rent					0	0
1 to 1		46722	0	0	0	0
	Stay	56066	0	0	0	0
	Move	46722	0	0	0	0
1 to NH		80000	0	0	0	0
	Stay	93444	0	0	0	0
	Move	80000		0	0	0
Other					0	0
1 to 1		50000	0	0	0	0
	Stay	50000	0	0	0	0
	Move	54000	0	0	0	0
1 to NH		15000		0	0	0
	Stay	20000		0	15000	0
	Move	7008		0	0	0

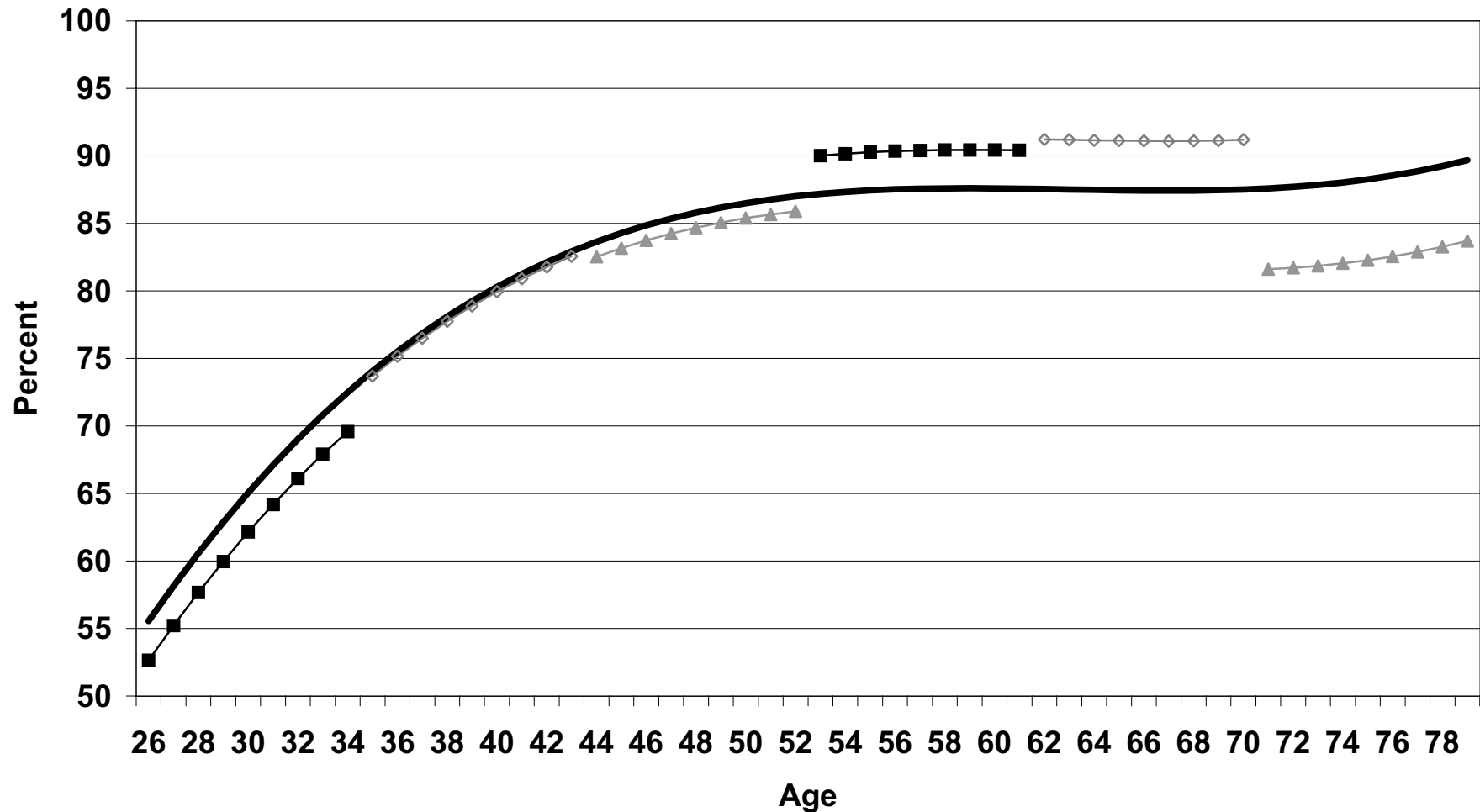
Source: Authors' calculations from AHEAD and HRS data.

Figure 1. Percent Owning for Two-Person Households
Mortality Adjusted Data from SIPP



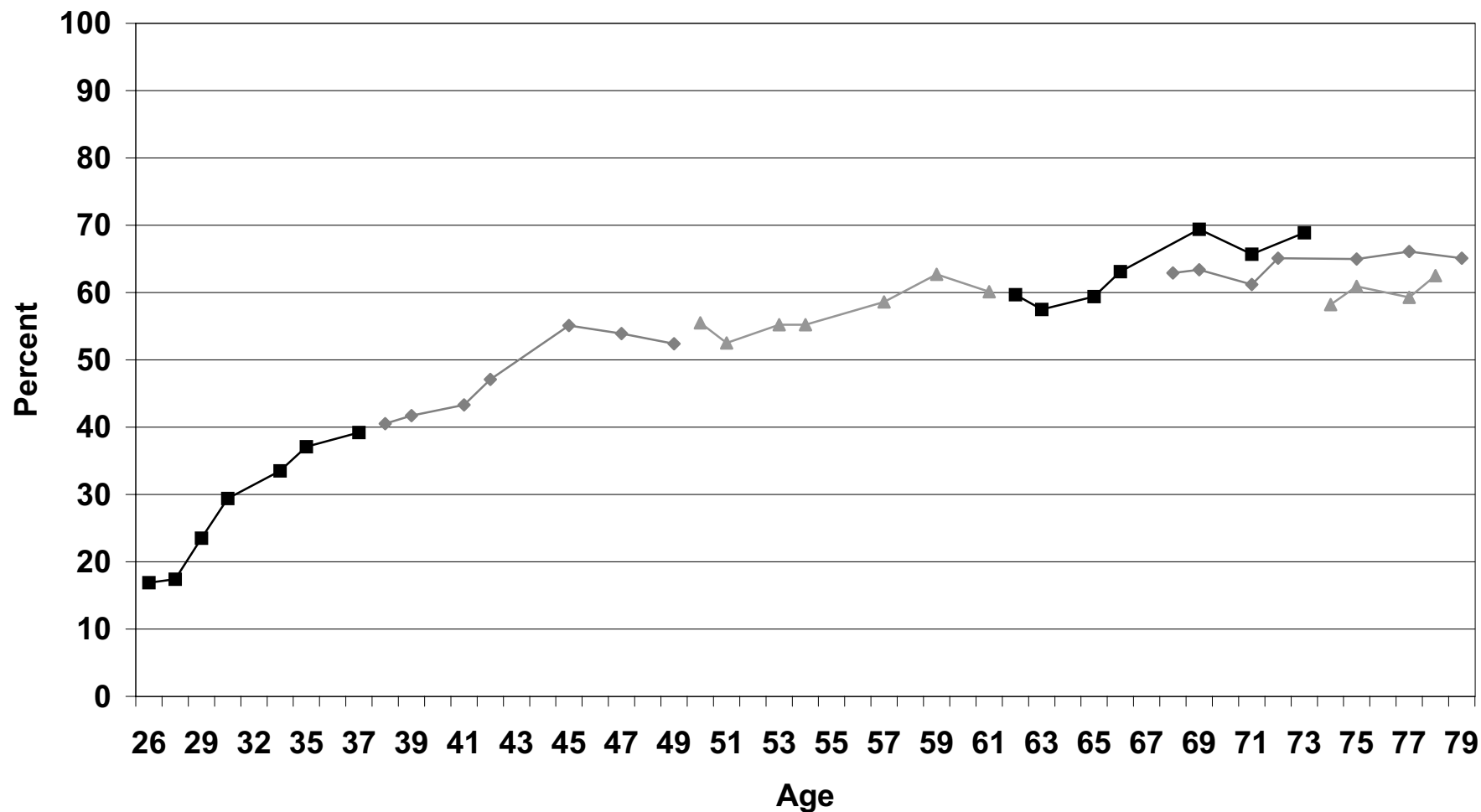
Source: Authors' calculations, SIPP data.

**Figure 2. Percent Owning for Two-Person Households
Mortality Adjusted Data from SIPP - Smoothed**



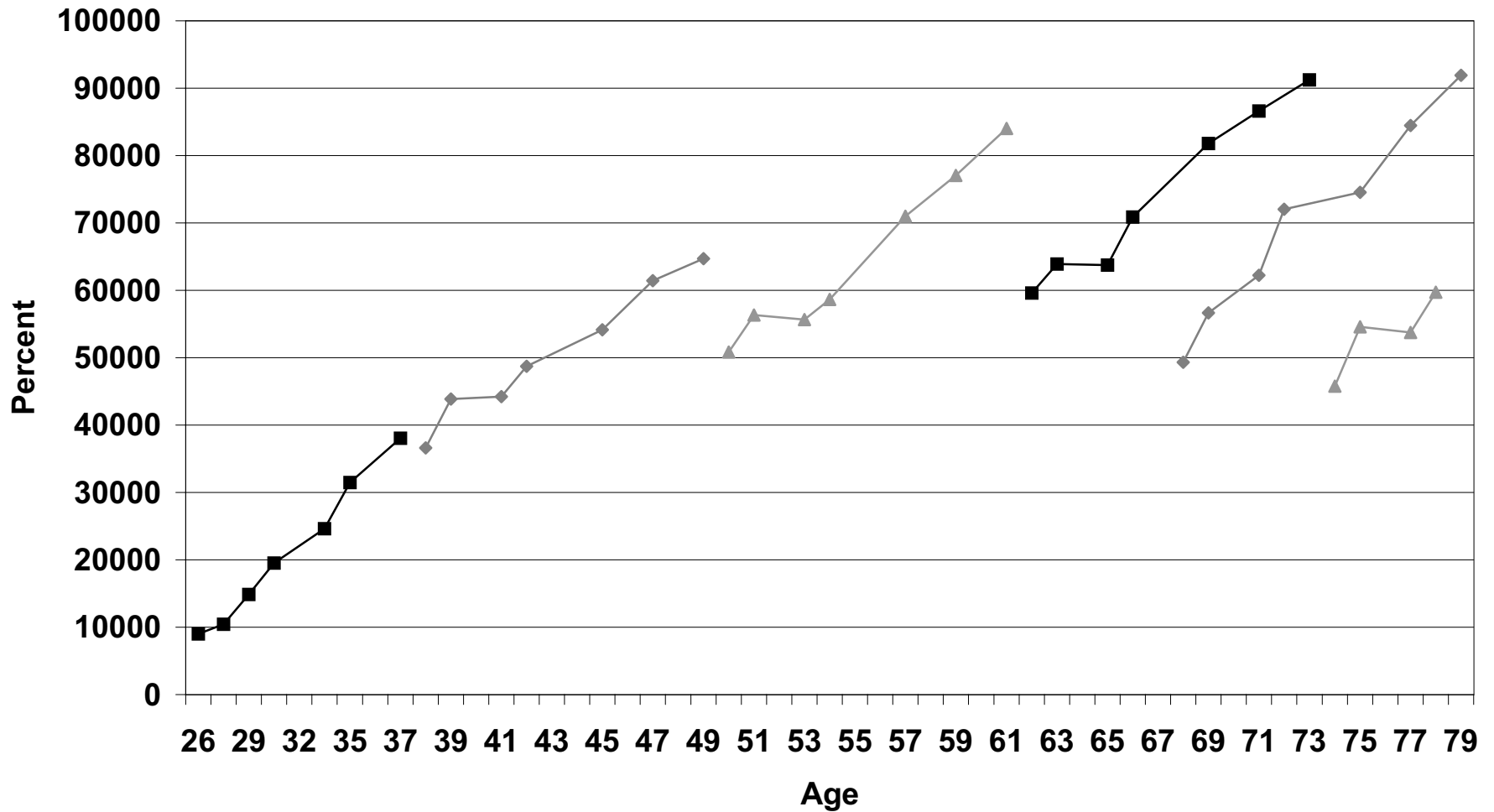
Source: Authors' calculations, SIPP data.

Figure 3. Percent Owning for One-Person Households
Mortality Adjusted Data from SIPP



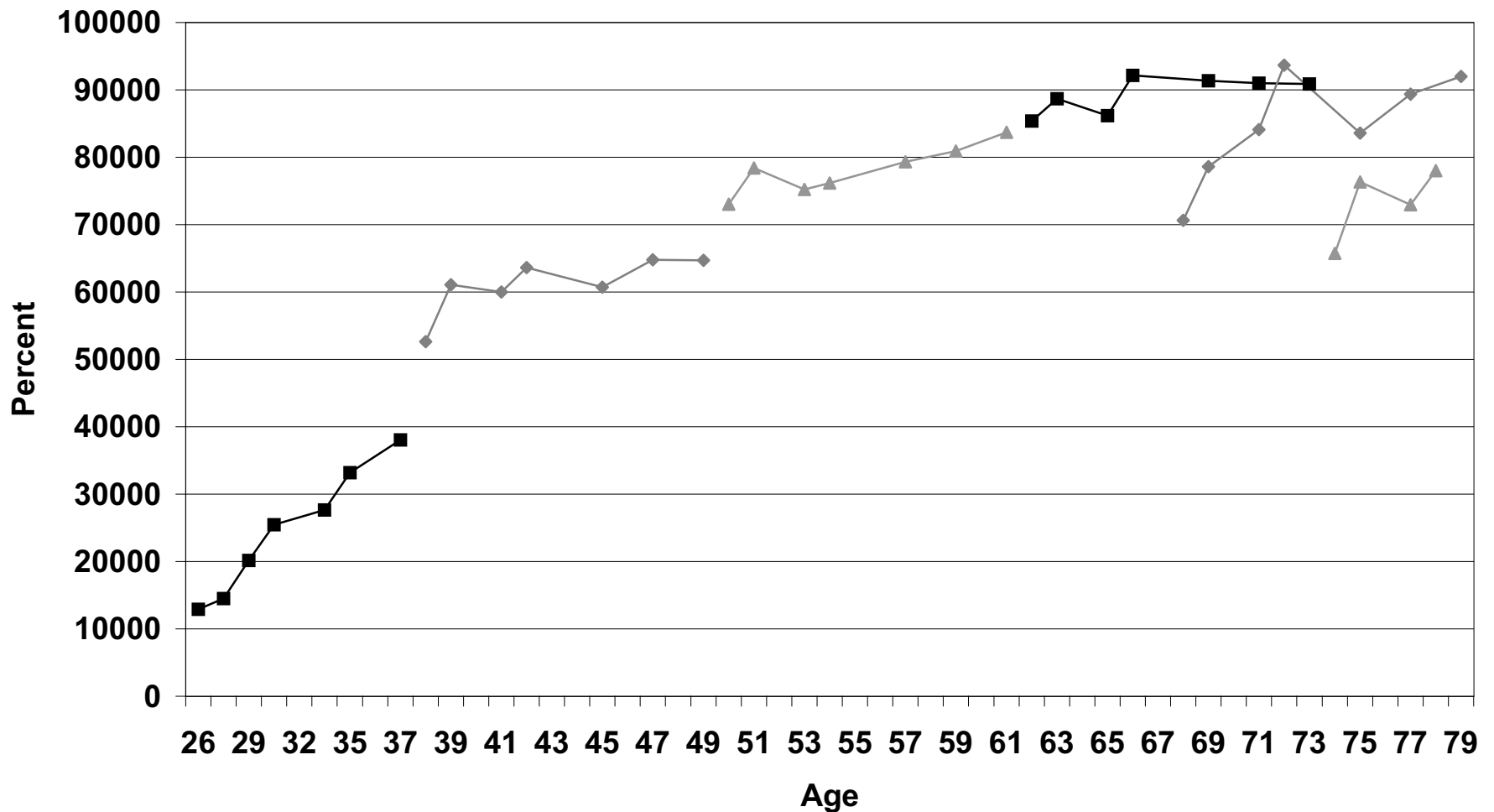
Source: Authors' calculations, SIPP data.

Figure 4. Home Equity for Two-Person Households
Data from SIPP



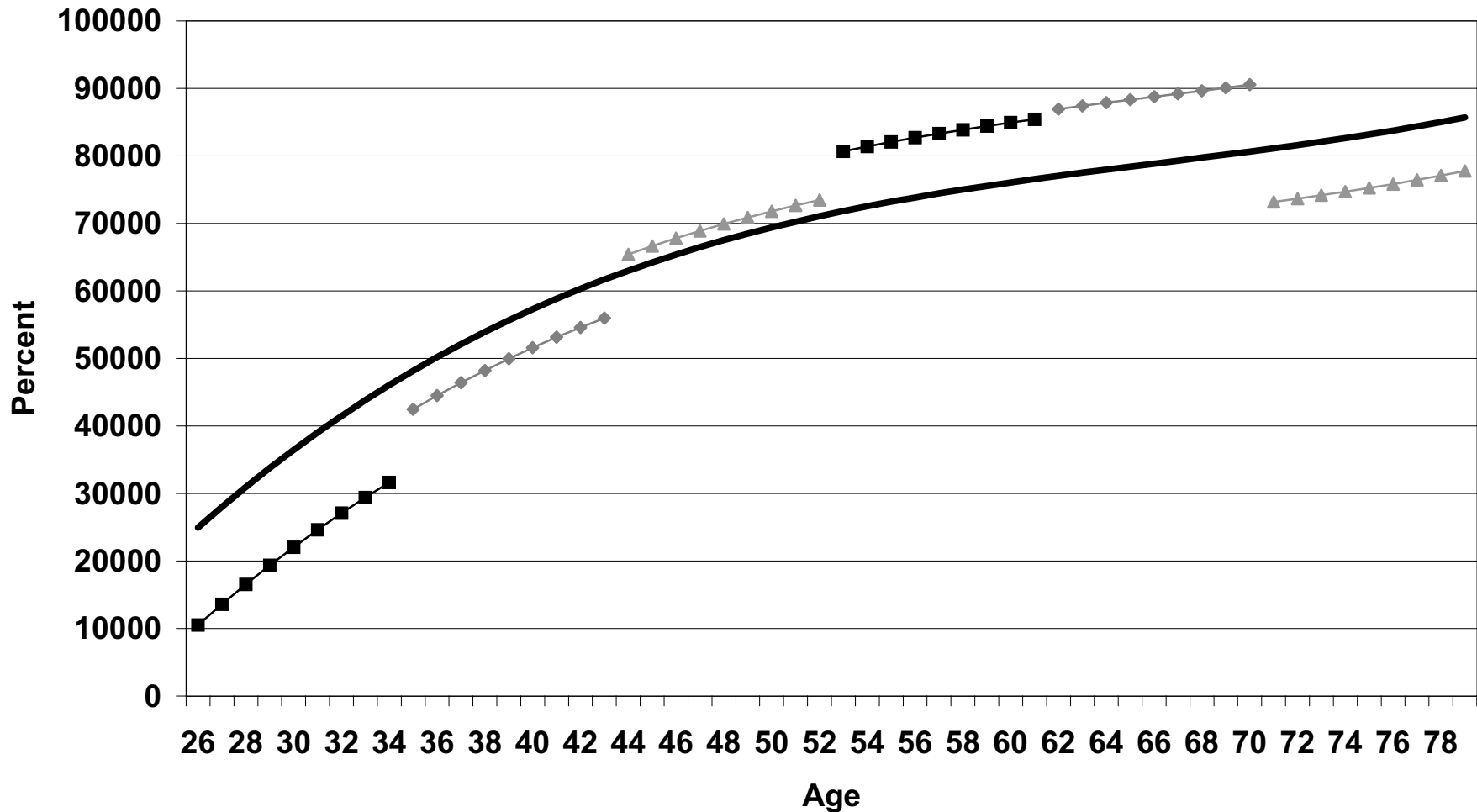
Source: Authors' calculations, SIPP data.

Figure 5. Home Equity for Two-Person Households
Mortality and CPI Adjusted Data from SIPP



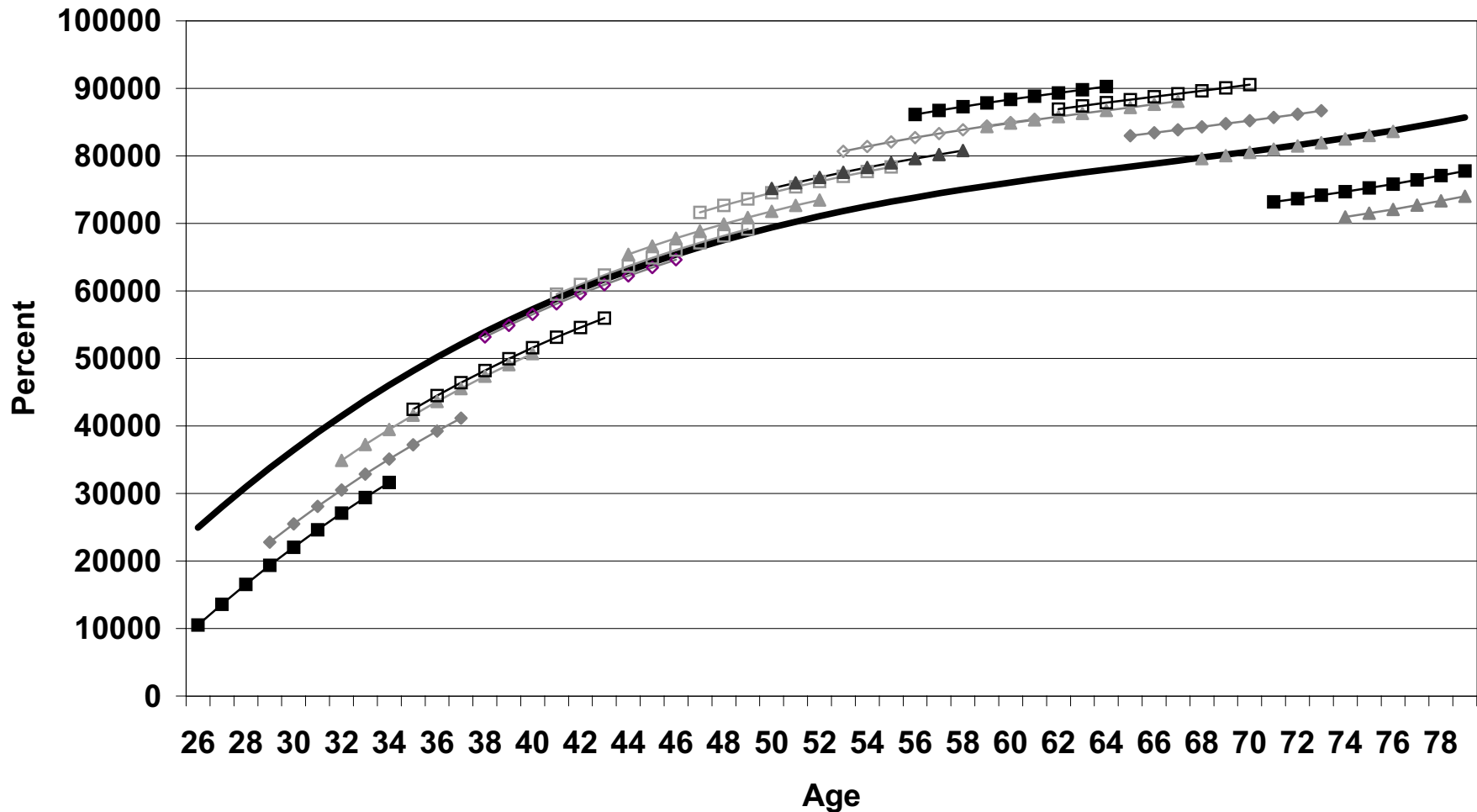
Source: Authors' calculations, SIPP data.

Figure 6. Home Equity for Two-Person Households
Smoothed Data from SIPP - Selected Cohorts



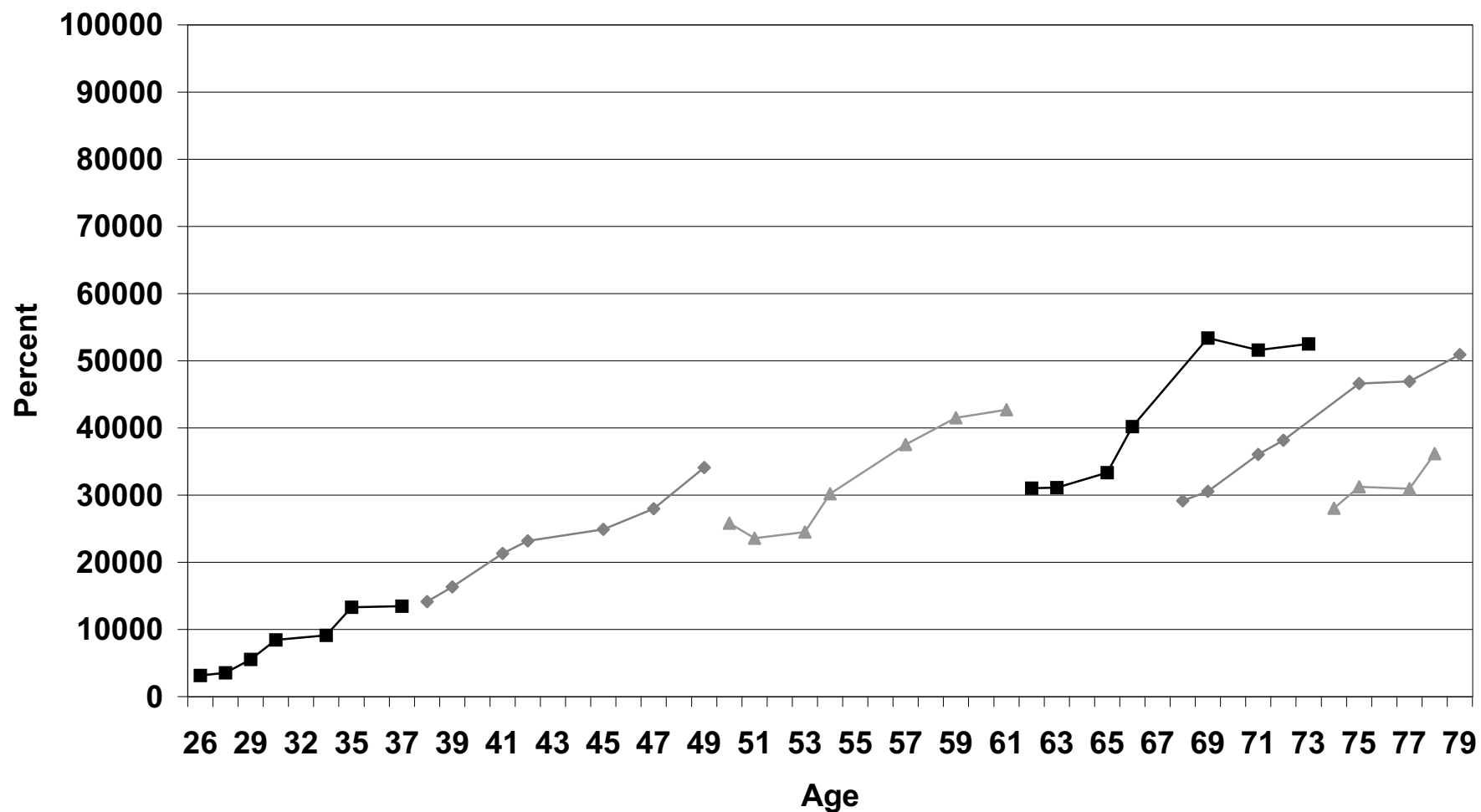
Source: Authors' calculations, SIPP data.

Figure 7. Home Equity for Two-Person Households
Smoothed Data from SIPP - All Cohorts



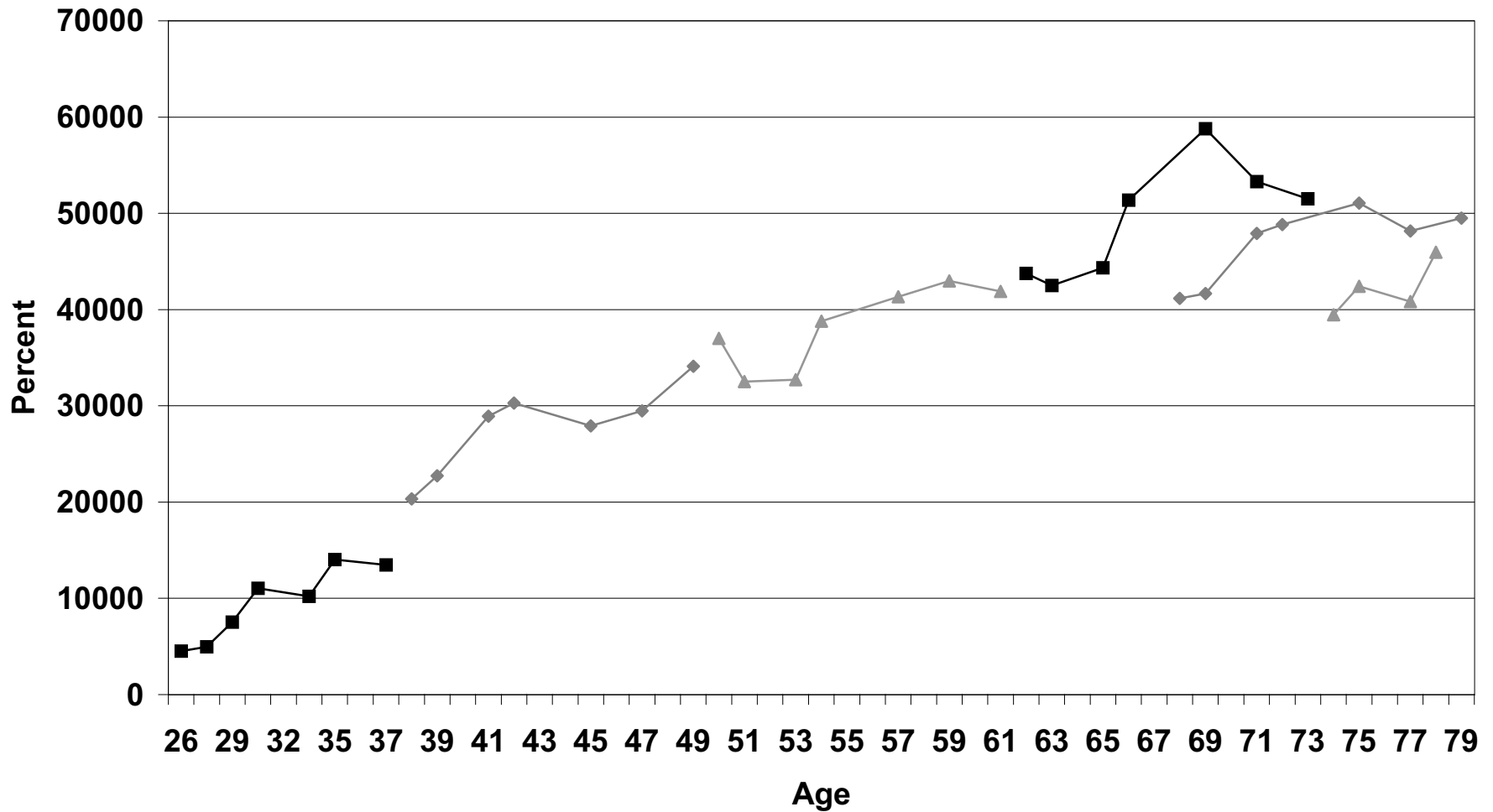
Source: Authors' calculations, SIPP data.

Figure 8. Home Equity for One-Person Households
Data from SIPP



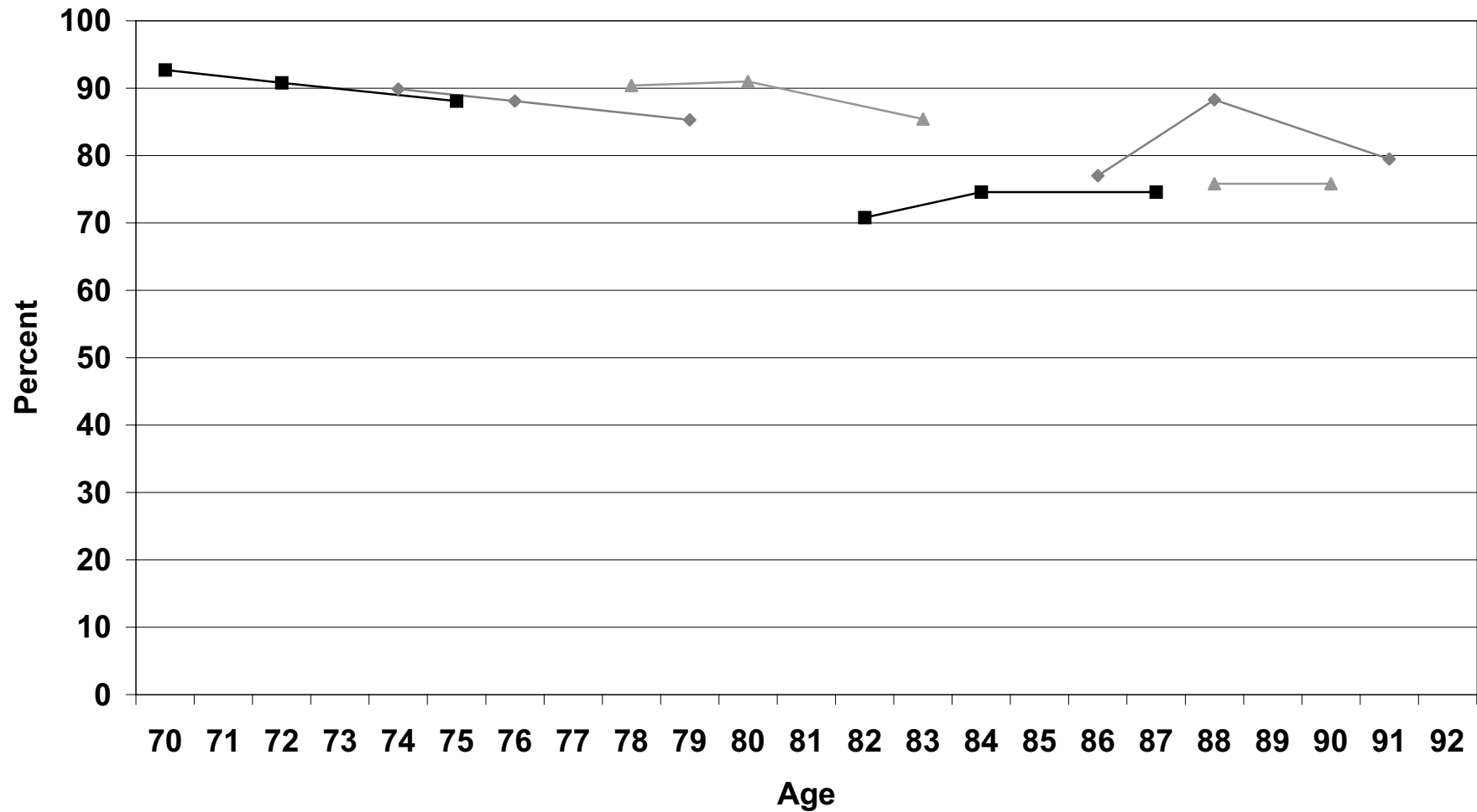
Source: Authors' calculations, SIPP data.

Figure 9. Home Equity for One-Person Households
Mortality and CPI Adjusted Data from SIPP



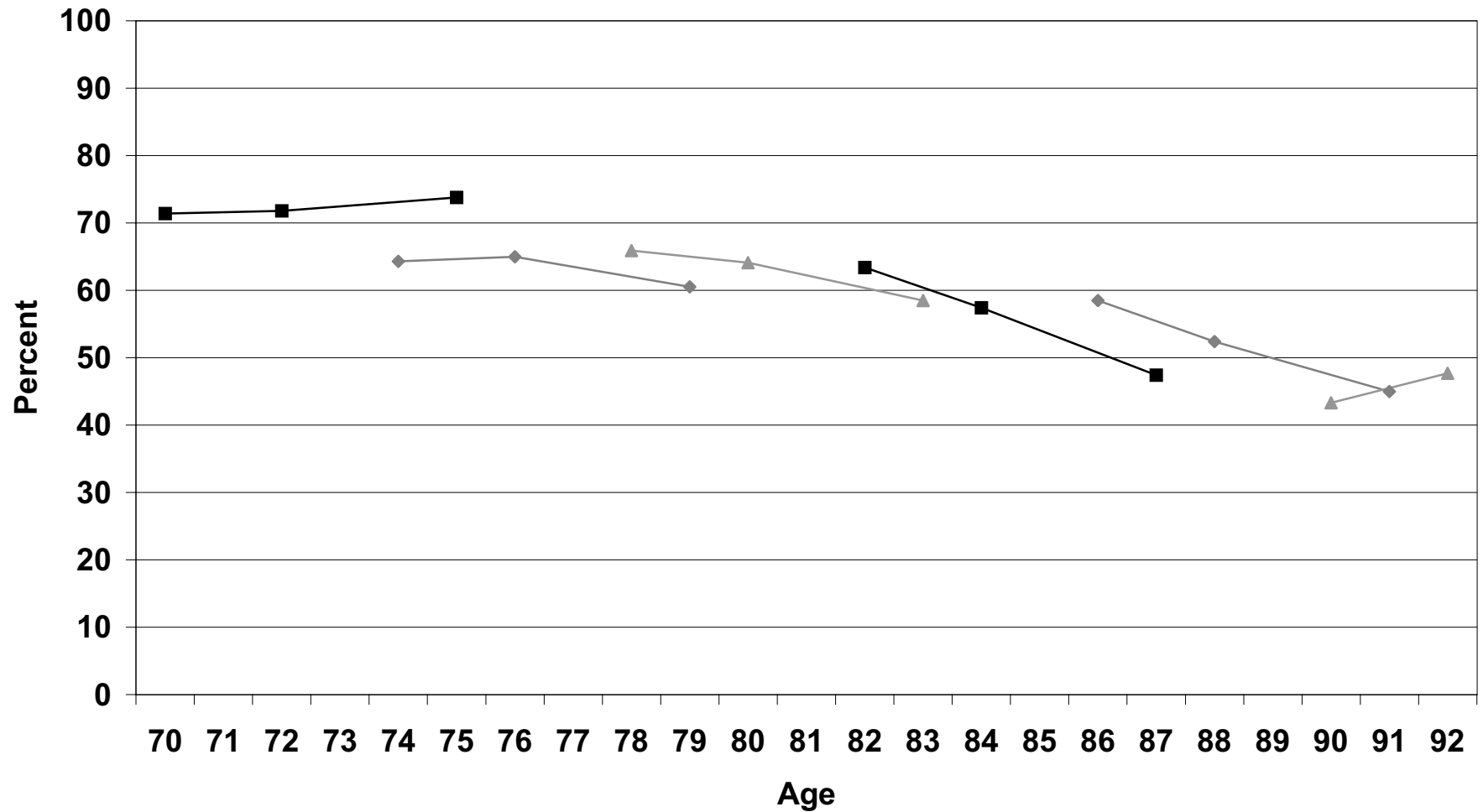
Source: Authors' calculations, SIPP data.

Figure 10. Percent Owning for Two-Person Households
Data from AHEAD



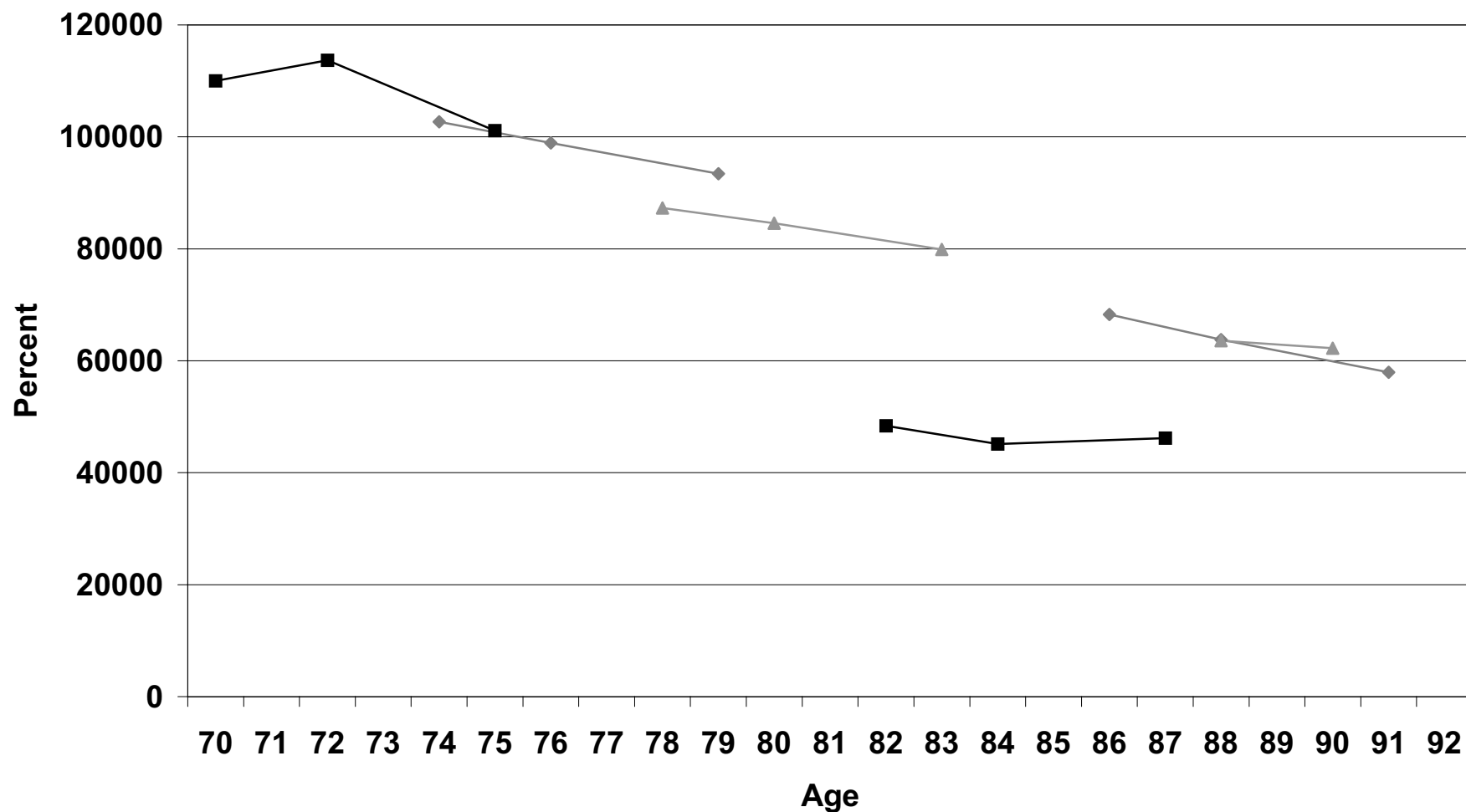
Source: Authors' calculations, SIPP data.

Figure 11. Percent Owning for One-Person Households
Data from AHEAD



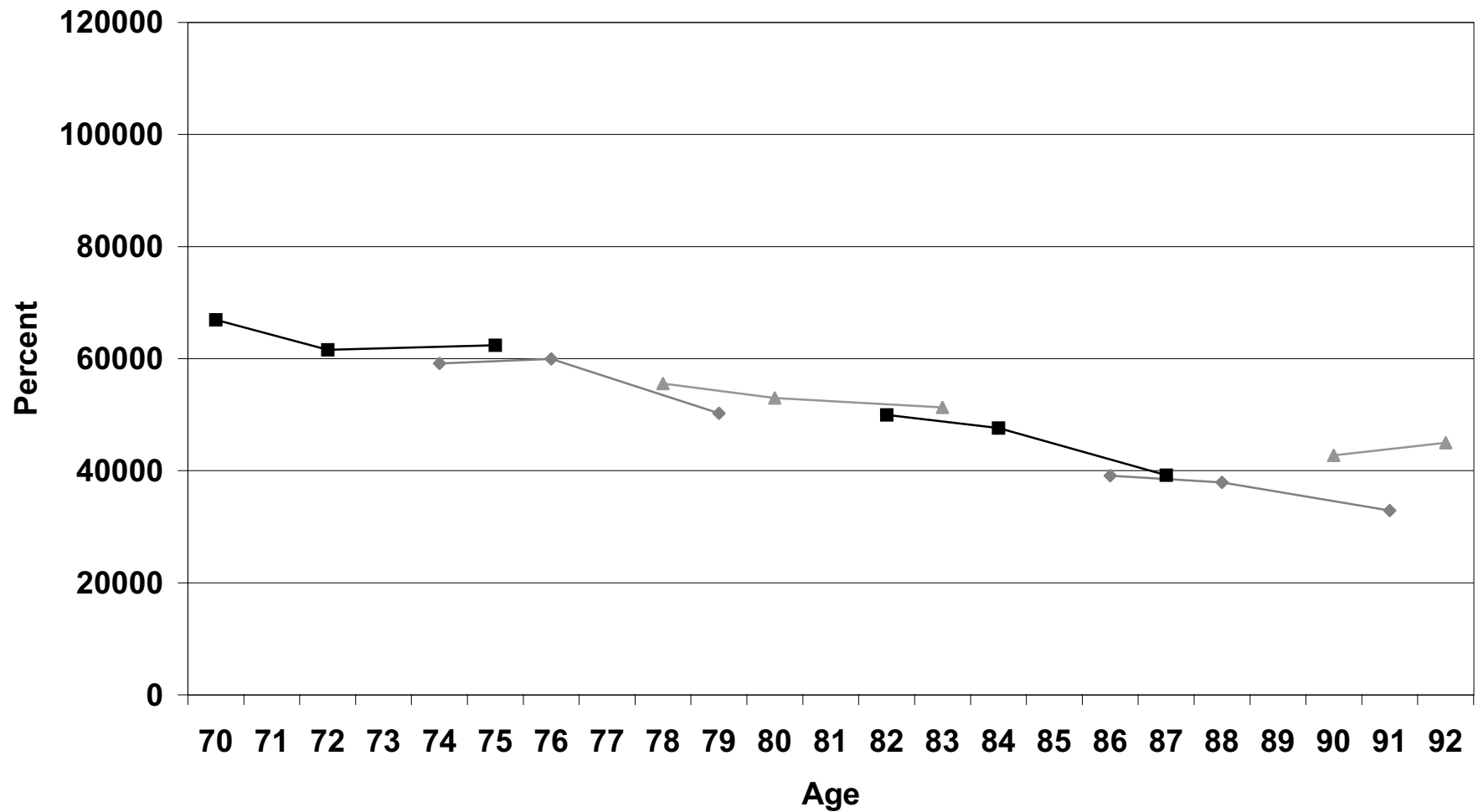
Source: Authors' calculations, SIPP data.

Figure 12. Home Equity for Two-Person Households
CPI Adjusted Data from AHEAD



Source: Authors' calculations, SIPP data.

Figure 13. Home Equity for One-Person Households
CPI Adjusted Data from AHEAD



Source: Authors' calculations, SIPP data.