THE SURVEY OF INCOME AND
PROGRAM PARTICIPATION

AGING AND THE INCOME VALUE OF HOUSING WEALTH

No. 122

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U. S. Department of Commerce BUREAU OF THE CENSUS

forthcoming in Journal of Public Economics

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July 1990

Financial support for this research has been provided by the National Institute on Aging, Grant No. P01 AG05842, the Hoover Institution, and by a Rockefeller Research Fund Fellowship at Dartmouth College. The working paper will appear in a forthcoming issue of **Journal of Public Economics**.

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The vast majority of the personal saving of most Americans is in the form of housing equity. Indeed most reach retirement age with very little liquid wealth, like bank saving accounts. One might expect therefore that housing wealth would be used to finance consumption as the elderly age. In fact reverse annuity mortgages have been proposed to facilitate drawing down of housing wealth while at the same time allowing families to continue living in their homes. Yet recent studies have shown that at least through age 73 housing wealth is typically not reduced as persons age.[1] We concluded in earlier work (Venti and Wise [1989b, 1989a]) that the retention of housing equity was not simply the result of transaction costs associated with moving. Housing equity increases with appreciation in home values as long as a family remains in the same home, but even the elderly who move from one home to another are as likely to increase as to decrease housing equity. Thus we also concluded that even if reverse annuity mortgages were readily available the demand for them would be very limited. The implication was that the typical elderly family did not want to reduce housing equity to finance other consumption.

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[1]See Venti and Wise [1989b, 1989a], Feinstein and McFadden [1989] and, Merrill [1984].

We analyze in this paper the extent to which housing equity could in fact change the consumption of the elderly, if housing equity were converted to a more liquid form. The mechanism for home equity conversion that we consider is a reverse annuity mortgage. The primary goal is to understand the potential effect on the current income of the elderly of conversion of illiquid housing wealth into an income stream. The demand for reverse annuity mortgages may be limited simply because these mortgages are too costly or because families that have low income from other sources also have low housing equity. We proceed as follows:

- First, we present the most recent data on the wealth of the elderly, emphasizing the large fraction of non-pension assets accounted for by housing equity.

- Second, we document that even among the older old housing equity is typically not reduced as the elderly age. Our earlier results were based on the Retirement History Survey (RHS) that followed elderly persons only through age 73. The analysis in this paper is based on the Survey of Income and Program Participation (SIPP), which includes all age groups.

- Third, we consider whether housing equity is treated as a substitute for liquid saving, by analyzing the relationship between housing equity and the change (possibly the reduction) in liquid assets as the elderly age. In particular, we ask whether persons with more housing equity more likely to consume liquid wealth as they age?

- Fourth, the potential of reverse annuity mortgages to increase the current income of the elderly is analyzed. In particular, we determine by how much the current income of elderly families would be increased if they were to obtain reverse mortgages, and thus convert housing equity into cash that could be used for day to day expenses.

We conclude that most low-income elderly also have little housing equity, although this is not always the case. In general, a reverse annuity mortgage would substantially affect the income only of the single elderly who are very old -- whose life expectancy is short. On the other hand, if the transfer were in the form of a lump sum payment -- rather than an annuity -- the payment would increase the liquid wealth of most elderly families by a large

fraction. Thus legislation that would facilitate the market for reverse mortgages could improve substantially the financial status of a small proportion of the elderly. But the specter of a large number of poor widows with vast amounts of "locked-in" housing equity does not reflect the reality. Most low-income elderly have relatively little housing wealth.

I. The Data and Housing Equity versus other Wealth.

A. The Data.

The analysis is based on the first panel of the new Survey of Income and Program Participation (SIPP). The SIPP is an ongoing rolling survey of the U.S. population. It is organized by panel. Each panel consists of eight interview waves administered every four months for 32 months. The first panel initially contained approximately 20,000 households and was first surveyed in 1984. The fourth and seventh waves included questions about housing costs. Most of the cross section results presented below are based on the fourth wave (administered in September through December 1984). It includes 6,579 households with reference persons age 55 and over, 3,891 age 65 and over, 1,592 age 75 and over, and 291 age 85 and over. The longitudinal analysis is based on the fourth and seventh waves.[2] The seventh wave (administered in

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[2]The fourth and seventh waves were not matched directly, but instead each was linked to the 1984 SIPP Full Panel Research File, provided by the Bureau of the Census. Without this special longitudinal file, it is not possible to determine the reasons for changes in family composition between the fourth and seventh waves.

The Census Bureau has provided the following statement about the data: "This report uses data from the Survey of Income and Program Participation 1984 Full Panel (Preliminary) File, which was released by the Census Bureau for research to improve understanding and analysis of the SIPP data. The data on the file are preliminary and should be analyzed and interpreted with caution. At the time the file was created, the Census Bureau was still exploring certain unresolved technical and methodological issues associated with the creation of this data set. The Census Bureau does not approve or endorse the use of this data set. The Census Bureau does not approve or

September through December 1985) includes 4,947 households with reference persons over age 55, 3,122 over age 65, 1,297 over age 75, and 263 over age 85.

The 1984 panel is the largest of the SIPP panels. Subsequent panels will include approximately 12,000 households. Ultimately the number of old old in all of the panels taken together will be much larger than the number now available. Detailed analysis of some questions is not possible with the current sample size. In particular, the number of homeowners that moved between 1984 and 1985 is small. Nonetheless, the key questions that we pose can be answered with considerable confidence.

B. Housing Wealth and the Composition of Total Wealth.

The composition of total wealth for all households, for homeowners, and for renters is summarized in figures 1a, 1b, and 1c, which are based on median wealth by asset category.[3] It is clear from figure 1a that most families approach retirement age with very little personal saving other than housing equity. For example, among households with heads 60 to 65, the median of

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endorse the use of these data for official estimates."

[3]The numbers on which the figures are based, and the comparable means, are shown in appendix tables 1a, 1b, and 1c of the working paper version of this paper, Venti and Wise [1990], and are available from the authors on request. In many instances throughout the paper both medians and means are shown. Although the asset category means provide a consistent summary, in that they sum to the total wealth mean, in some instances they are a misleading indicator of the wealth of the typical household. This is particularly true for liquid wealth; the median for all households is $7.8 thousand, compared to a mean of $34.3.

liquid wealth is only $6.6 thousand; the median of housing equity is $43.0.[4]

The majority of families rely heavily on Social Security (SS) benefits for support after retirement, and to a more limited extent on the saving that is done for them by employers, through defined benefit pension plans. The SIPP data allow estimation of the value of SS and pension plan benefits only after the payments are received.[5] Thus wealth in the form of SS and pensions is only recorded for persons who have begun to receive the payments. Most persons have retired by 65 and thereafter are receiving the benefits to which they are entitled. About 59 percent of households with reference persons between 65 and 70 receive pension benefits; 89 percent receive SS benefits. The present value of pension and SS wealth is based on life tables together with the amount of the annual payments. Social Security benefits are indexed to inflation; private pension benefits typically are not.[6] As can be seen from figure 1a, SS and pension wealth is by far the most important component of the wealth of most elderly. Among households with heads 65 to 70, for

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[4]The category "liquid wealth excluding stocks" is broadly defined to include interest earning assets held in banks and other institutions, mortgages held, money owned from sale of businesses, U.S. Savings Bonds, and checking accounts, less unsecured debt. The category "liquid wealth including stocks" also includes equity in stocks and mutual fund shares.

[5]The SIPP data do not contain SS earnings histories -- that determine SS benefits, nor do they contain detailed pension plan provisions

[6]The present values of pension and SS benefits are the discounted survival weighted streams of income from each source received by the reference person and the spouse if present. Discounting is at 6 percent and survival probabilities are calculated from mortality tables by sex. Payments from SS, military pensions, federal employee pensions, and the railroad retirement pension are assumed to be indexed at an annual rate of 4 percent. All other sources of pension income are not indexed in the wealth calculations.

example, the median of SS and pension wealth combined is $113.4 thousand; the median of housing wealth is $38.0 thousand and the median of liquid financial assets is only $10.0 thousand. The decline in SS and pension wealth with age is largely an artifact of declining life expectancy. As will be shown below, the lower housing equity of older households is a cohort effect and does not reflect a reduction of housing equity as individual households age; in fact, housing equity increases on average as the elderly age; there is little change in housing equity even among families that move from one home to another.

Comparison of figures 1b and 1c shows that households who rent have substantially less wealth than homeowners in all asset categories. The median total wealth of homeowners is $170.4 thousand; the median for renters is $59.3 thousand.

In summary: the majority of elderly households live on fixed annuity income. The fixed income of most households could be increased by only a small amount by depleting liquid assets; most households have very small amounts of liquid wealth. Housing is the only form of wealth that could potentially add appreciably to the fixed annuity income of the typical elderly family. Whether housing equity is now used for this purpose is considered next.

II. Aging and Housing Equity.

Because changes in housing equity -- other than the increase due to market appreciation in home values -- have almost always been associated with moving, we emphasize here the extent to which the elderly reduce housing equity when the family preference is the easiest to realize. Based on the Retirement History Survey (RHS), we concluded in an earlier paper (Venti and Wise [1989a]) that elderly homeowners who moved, through age 73, were as

likely to increase as to decrease housing equity. Indeed, the average change in the housing equity of movers was not significantly different from the average change for stayers, whose housing equity increased simply because of appreciation in home values. The largest changes were among those with low income and high housing equity -- who tended to reduce housing equity -- and among those with high income and low housing equity -- who tended to increase housing equity when they moved. We want to consider here whether that result is different for the older elderly, who may be more likely to face the need to use housing equity to meet other expenses.

Because of the small number of movers in the SIPP sample of elderly households, it is not possible to obtain estimates from the SIPP data exactly comparable estimates based on the RHS. A simplified version of our earlier specification can be estimated, however. In addition, it is possible to compare the housing equity of recent movers with the equity of those who have owned their homes for some time. We consider each method in turn.

A. Moving and Change in Housing Equity.

Because of reporting errors, families who report an unusually high level of income or housing equity in one year tend to report a lower level the next year. That is, errors in variables create a regression toward the mean. This tends to exaggerate the reported change in housing equity for movers with low income and high housing equity and with high income and low housing equity. We correct for this effect by considering only the change for movers that was above and beyond the reported change for stayers.

This is accomplished be by using an analysis of variance specification of the form

$$H_{1985} - H_{1984} = \mu + \sum_{ij} d_{ij} \text{ , for stayers}$$

(1)

$$H_{1985} - H_{1984} = \mu' + \sum_{ij} d'_{ij} \text{ , for movers,}$$

where $H_{1985} - H_{1984}$ is the change in housing equity between 1984 and 1985, $\mu + d_{ij}$ represents the average change in housing equity for stayers in the i^{th} income and the j^{th} housing equity interval, and $\mu' + d'_{ij}$ represents the change for movers. The estimates are normalized by setting $\sum d_{ij} = 0$ and $\sum d'_{ij} = 0$. Thus μ is a weighted average change in housing equity for households that do not move and μ' is the weighted average change for movers. Separate estimates are obtained for stayers and movers. The results are shown in the top two panels of table 1.

The effect of reporting errors is clearly evident in the estimated changes by income and housing equity for stayers. Households who report the unusual combination of low income and high housing equity in 1984, tend to report lower housing equity the next year; households who report high income and low housing equity in 1984 tend to report higher housing equity the next year. This is the regression toward the mean. There is essentially no reported change for households who report income and housing equity around their mean levels (income interval 2 and housing equity interval 2).

The pattern for movers is much more pronounced. Treating the change for stayers as due to reporting errors, the actual change for movers can be estimated by subtracting the change for stayers from the change for movers. The estimated change for movers in the i^{th} income and the j^{th} housing equity interval, net of reporting errors, is given by $\mu' + d'_{ij} - d_{ij}$. The results are reproduced in the lower panel of table 7.

The average change for stayers is 1.6, with a standard error of 1.2; the average for movers is -8.9, with a standard error of 5.3. Thus although there is a reduction in the average housing equity of the small sample of movers, it is not possible to reject the hypothesis that the average change for movers is zero, nor that on average the change for movers is the same as the change for stayers.

B. Housing Equity and Years Since Purchase.

Data for a larger sample can be used by considering housing equity by the number of years since the house was purchased. Table 2 shows median housing equity by age and by the number of years since the home was purchased. These data suggest that families that moved in the past three years, or in the past six years, have approximately as much housing equity as households in the same cohort that have owned their homes longer. Indeed, of households over 65, recent movers tend to have the largest housing equity, suggesting that they increased equity when they moved.

A more formal decomposition of the means into cohort effects, years owned effects, and interaction effects, is provided by a specification of the form

$$(2) \qquad H_{1984} = \mu + \sum_i a_i + \sum_j l_j + \sum_{ij} r_{ij} \ ,$$

where μ is an overall mean, the a_i are age effects, the l_j are years owned effects, and the r_{ij} are interaction terms.[7] The results are shown in table

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[7]The parameters are normalized by setting $\sum_i a_i = \sum_j l_j = \sum_i r_{ij} = \sum_j r_{ij} = 0$.

3, with the years owned effects to the right, the age effects across the bottom, and the interaction terms as cell entries. The cohort effects show a decline in housing equity with age, but given the cohort, there is little relationship between housing equity and years owned, as indicated by the years owned effects. In particular, families over 65 who have bought homes in the last three years have no less housing equity than families who have owned their homes longer; the relevant coefficient is -1.8 with a standard error of 4.2. The hypothesis that all of the interactions terms are zero cannot be rejected, based on an F-test, nor can the hypothesis that both the interaction and the years owned effects are zero. An F-test does reject the hypothesis that the cohort effects are zero.

In summary: Consistent with the RHS data, the evidence from the small sample of SIPP movers shows that families with unusually large amounts of home equity wealth, given income, are likely to reduce home equity when they move; families with unusually little home equity, given income, are likely to increase home equity when they move. These data also suggest that when older families move there may be some reduction in home equity on average, but the small sample of movers does not allow a precise estimate. The data on home equity by years since purchase suggest that older families do not typically reduce housing equity when they move. We conclude therefore that the weight of the evidence indicates little change, <u>on average</u>, in the housing equity of older families when they move. The evidence for the older households in the SIPP is consistent with the evidence for the younger old in the RHS. At the time of a move, conscious choice does not lead to a reduction in housing equity. But because of appreciation in home values, housing equity increases among families who do not move. Thus these results, like similar results

based on the RHS, suggest a limited demand for reverse annuity mortgages, were they readily available. But among the small proportion of families with low income and relatively large home equity, the demand could be important.

III. Is Home Equity a Substitute Liquid Wealth?

Although the findings reported in the previous section show little reduction on average in housing equity as persons age, it may be that the reduction in housing equity depends on the availability of other more liquid assets and vice versa. It is common to treat home equity just like any other form of saving, when considering saving and wealth accumulation, with the implication that one is a good substitute for the other. If this were true, and assuming that the elderly would like to hold some wealth for precautionary purposes, it might be expected that the reduction in liquid assets with age would depend on the amount of home equity, with those with more home equity more willing to use liquid assets to meet current expenses.

To determine whether this is the case, we consider the change in liquid wealth between 1984 and 1985 as a function first of housing equity and liquid wealth, and then as a function of housing equity and total non-housing wealth. Median changes are shown in table 4. The data suggest little relationship between housing equity and decumulation of liquid wealth. The median change in liquid wealth is zero. More formal estimates are obtained with an analysis of variance model of the form

$$(3) \qquad L_{1985} - L_{1984}(1+r) = \mu + \sum_i e_i + \sum_j y_j + \sum_{ij} (ey)_{ij} ,$$

where r is the return on bank saving accounts (taken to be 6 percent), L represents liquid assets, e_i represents the ith home equity interval effect,

y_j represents the jth income interval effect, and $(ey)_{ij}$ the interaction effect associated with the ith home equity and the jth income interval. The estimates are shown in table 5. Unreported estimates with total non-housing wealth instead of income yield similar results. Two aspects of the results are striking: First the data show, on average, no decline in liquid wealth with age; the weighted average is $2,000, with a standard error of $3,200. Second, the data show no relationship between housing equity and the reduction in liquid wealth. (The result is confirmed statistically by an R^2 value of 0.002, indicating that there is no statistically significant relationship between housing equity -- or income -- and change in liquid assets.) Thus these data show no substitution of one form of wealth for the other.[8] The result of course may simply reflect the fact that most elderly have very little liquid wealth and thus have almost nothing to deplete.

IV. Reverse Mortgages and the Annuity Value of Housing Equity.

The analysis in section II suggests that the potential demand for reverse mortgages, even among the older old, is likely to be small on average; it appears that the typical elderly family would not choose to withdraw funds from housing equity to meet day-to-day living expenses, even if it were easy to do so. And, the simple calculations reported in section III suggest that depletion of other liquid assets is not typically substituting for transfers from housing equity. In this section we consider directly the potential of reverse mortgages to affect the financial position of the elderly. In

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[8]Further evidence that different forms of assets may not substitute for each other is provided by Shefrin and Thaler [1988] and Thaler [1990].

particular, how would they affect the current income of the poorer elderly, if, contrary to the apparent limited demand for them, the elderly took advantage of this financial instrument?

A. Assumptions.

The question is most easily addressed by considering the potential income from a "life-time" reverse annuity mortgage. Assume that the bank obtains the house at the death of the owner (or owners). In the meantime, the owner continues to live in the house. Thus the bank will have title to an asset at some uncertain future time. Suppose that the current value of the house is H_a, that it will appreciate at an annual rate g, that the owner who is now age a will die at age t with probability $d(t|a)$, and that the bank discounts future income at the rate m (possibly the mortgage rate). The present value of the house to the bank is then

$$(4) \qquad L = \sum_{t=a}^{A} [(1+g)^{t-a} H_a] d(t|a)(1+m)^{-(t-a)} ,$$

where A is as long as any owner will live, here taken to be 110. Assume that L is the lump sum that the bank would pay the owner now for the future title to the house.

The owner could in principle use the lump sum in any number of ways, including investment in liquid assets like saving accounts or stock funds. To assure a certain future income, however, the owner may wish to buy an annuity. In this case, the income from the sum L depends on the "annuity yield," r. If $l(t|a)$ is the probability that the owner will be living at age t, then the annual reverse annuity mortgage payment P is determined by the relationship

$$L = \sum_{t=a}^{A} [P]1(t|a)(1+r)^{-(t-a)} \quad , \text{ or}$$

(5)

$$P = L/[\sum_{t=a}^{A} 1(t|a)(1+r)^{-(t-a)}] \quad .$$

Both L and P are reported below for subsets of the SIPP population.

A life-time reverse annuity mortgage like the one described above tends to exaggerate the potential income from housing equity, and is in fact the least common of current arrangements. Sale-leaseback and fixed term loans are more common. Under the sale-leaseback arrangement, the bank buys the home outright and leases it back to the owner. Fixed term loans provide a payment to the owner for a fixed term. At the expiration of the term the loan payments are repaid, through sale of the home. The "loan" is typically restricted to 80 percent of the value of the home. Under some arrangements, the owner shares in the appreciation of the home.[9]

The payment under the life-time annuity arrangement depends on several parameters: the bank discount (mortgage) rate m, the home value appreciation rate g, and the annuity yield r. New home mortgage rates averaged 8.80 percent in the 1970's and 12.31 percent between 1980 and 1987. The average annual increase in the median price of one-family homes was 9.32 percent in the 1970's and 6.22 percent between 1980 and 1985. The increase has not been above 4 percent since 1981. Annuity yields are typically 4 to 6 percentage points below the long-term interest rate, according to Friedman and Warshawsky [1985]. In the calculations below, the bank discount rate is assumed to be 10

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[9]For an overview of existing programs see U.S. HUD [1985].

percent, home values are assumed to appreciate at 5 percent a year, and the annuity yield is assumed to be 5 percent.

To illustrate the sensitivity of the calculations to these assumptions the annual payment to a single women with home equity of $45,700 (the median housing equity of home owners over age 65) is shown in table 6 for several ages and for alternative parameter assumptions.

B. Simulations.

The potential additional income from reverse annuity mortgage payments is summarized in figures 2a through 2c. The figures are based on medians by income interval and age. More detail is provided in appendix table 1 by marital status, age, and income. An annual payment is calculated for each homeowner. The income thirds are determined separately for each age interval. (For example, the "low" income interval for persons age 65 to 70 refers to the third of homeowners with the lowest incomes in the 65 to 70 age group.) For comparison, the median income and the median home equity within each interval are also shown. The SIPP "top codes" age at 85; thus all persons 85 or older are reported to be 85. The annuity payment are calculated assuming that each person in this age category is 85. Thus the simulated payments underestimate the median payment to all persons 85 or older.

The amount of the reverse annuity mortgage payment depends on how long the family is expected to remain in the house. Thus the payments increase with age because the expected number of years over which payments will be received declines (and because the bank obtains title to the house sooner). Because life expectancy is greater for women than men at any age, the annual payment is less for women than for men, given home equity. (Of course, home equity may also differ.) Married couples will also tend to receive less than

single persons because payments will continue as long as either of them is still living, according to our assumptions. Homeowners with higher incomes also have higher reverse annuity mortgage payments because home equity typically increases with income.

The income of typical married couples would be affected very little by reverse annuity mortgage payments. The median income of couples is $24,625; the median annual reverse annuity mortgage would be $1,358. Even for most low income couples the median payment would be a small proportion of median annual income. A reverse annuity mortgage would mean only a 4 percent increase in the income of the typical low-income couple aged 55 to 60; it would mean approximately a 10 percent increase for those 65 to 70. Only for the oldest low income couples would a reverse mortgage mean a substantial relative increase in income. For those who are 85 and over the increase would be about 35 percent. The payment is larger for the older group and their income is lower.

Single persons stand to gain the most, in relative terms, from reverse annuity mortgages primarily because they have much lower incomes than married couples.[10] The median income of single men is only 60 percent of the median for couples; the median income of single women is only 44 percent of the median for couples. The median payment for low-income single men is almost 50 percent of their median income. The median payment for low-income single women is about 36 percent of their median income. Indeed for both low-income

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[10]This is consistent with the limited operational experience with reverse mortgages. Three variants of reverse mortgage programs are summarized in U.S. HUD [1985]. Single women accounted for 69, 89, and 82 percent of each program's participation.

men and women 85 and over, the median reverse annuity mortgage payment is almost as large as other income. The difference between the payments to single men and single women arises primarily because of the longer life expectancy of women.

It is a common perception that widows -- the large majority of single women -- have relatively large amounts of home equity wealth compared to income. These data suggest that that is true only for the small proportion of widows who have the lowest incomes and are at least 70 years old. But it is not the situation of the typical widow. Overall, the median reverse annuity mortgage payment is about 20 percent of the median income of widows.

One of the reasons that the annuity payments are so low is that the annuity yield is low. The stream of payments that can be "purchased" with a dollar is much less than actuarially fair; either because the profit and fees on annuities are large or because of adverse selection; the buyers of private annuities may have unusually long lives. Thus a lump sum payment may be of greater value than an annuity to the typical elderly person.[11] Figures 3a through 3c summarize the potential addition to liquid assets from reverse mortgage lump sum payments. The figures are based on median values in each interval. More detail is presented in appendix table 2. The table shows the median potential reverse mortgage lump sum payment, together with median liquid wealth and other non-housing wealth (principally pension and SS wealth).

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[11]Again, this is supported by the limited operational experience. Of the first 43 reverse mortgages closed in a trial program in Buffalo during 1983-84, only four families chose to receive an annuity; the remainder chose a lump sum option. See Weinrobe [1985].

The lump sum payments are typically much greater relative to liquid wealth than the annuity payment is relative to annual income. The median lump sum payment for married couples would be almost twice as large as median liquid wealth, whereas the annuity payment would be less than 6 percent of income. The median lump sum for low-income couples over 85 would be almost ten times as large as liquid wealth. Relative to liquid wealth, the lump sum is especially large for the oldest low-income single persons; the median for single men and for single women is over 17 times as large as their median liquid wealth. Indeed for the low-income oldest old single persons the lump sum is approximately equivalent to all other wealth combined.

V. Summary.

Although housing equity is the vast majority of the saving of most Americans, the weight of the evidence from the 1984 SIPP panel suggests that even the older elderly do not typically reduce housing equity as they age, consistent with earlier findings for the younger old.[12] In addition, summary calculations show essentially no substitution of housing equity for non-housing saving; the depletion or accumulation of non-liquid wealth with age seems unrelated to housing equity. Indeed in this sample, the liquid wealth of the typical elderly family changes very little with age. The median change is zero. Thus <u>most</u> elderly live on Social Security and pension annuities without using housing equity for current consumption. Because housing equity

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[12]This conclusion is qualified because of the relatively small number of movers in the sample. When the data from all four of the SIPP panels become available and can be combined, a more precise estimate will be possible.

is such a large fraction of the non-pension wealth of most families, it is natural to consider the extent to which current consumption could be increased by converting housing equity to liquid assets, that could be used for current consumption.

Our calculations show that the income of most elderly families would be increased very little if housing equity were converted to current income through a reverse annuity mortgage. This may be a principle reason for the limited demand for such mortgages. On the other hand, a reverse annuity mortgage would double the income of typical single persons over 85. In general, the relative addition to income from a reverse annuity mortgage increases with age and is largest for low-income single persons.

Lump sum reverse mortgage payments would be much larger, relative to liquid wealth, than annuity payments are relative to income. That is, the elderly could increase liquid wealth much more than income by means of a reverse mortgage. This is because most non-housing wealth of the elderly is in the form of SS and pension assets -- from which most income is derived -- and, to a lesser extent, because of the low yield on privately purchased annuities.

Legislation that would facilitate the market for reverse mortgages could improve substantially the financial status of a small proportion of the elderly. But the specter of a large number of poor widows with vast amounts of locked-in housing equity does not reflect the reality. Most low-income elderly have relatively little housing wealth.

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Figure 1a. Median Wealth by Age and Asset Category
All Households

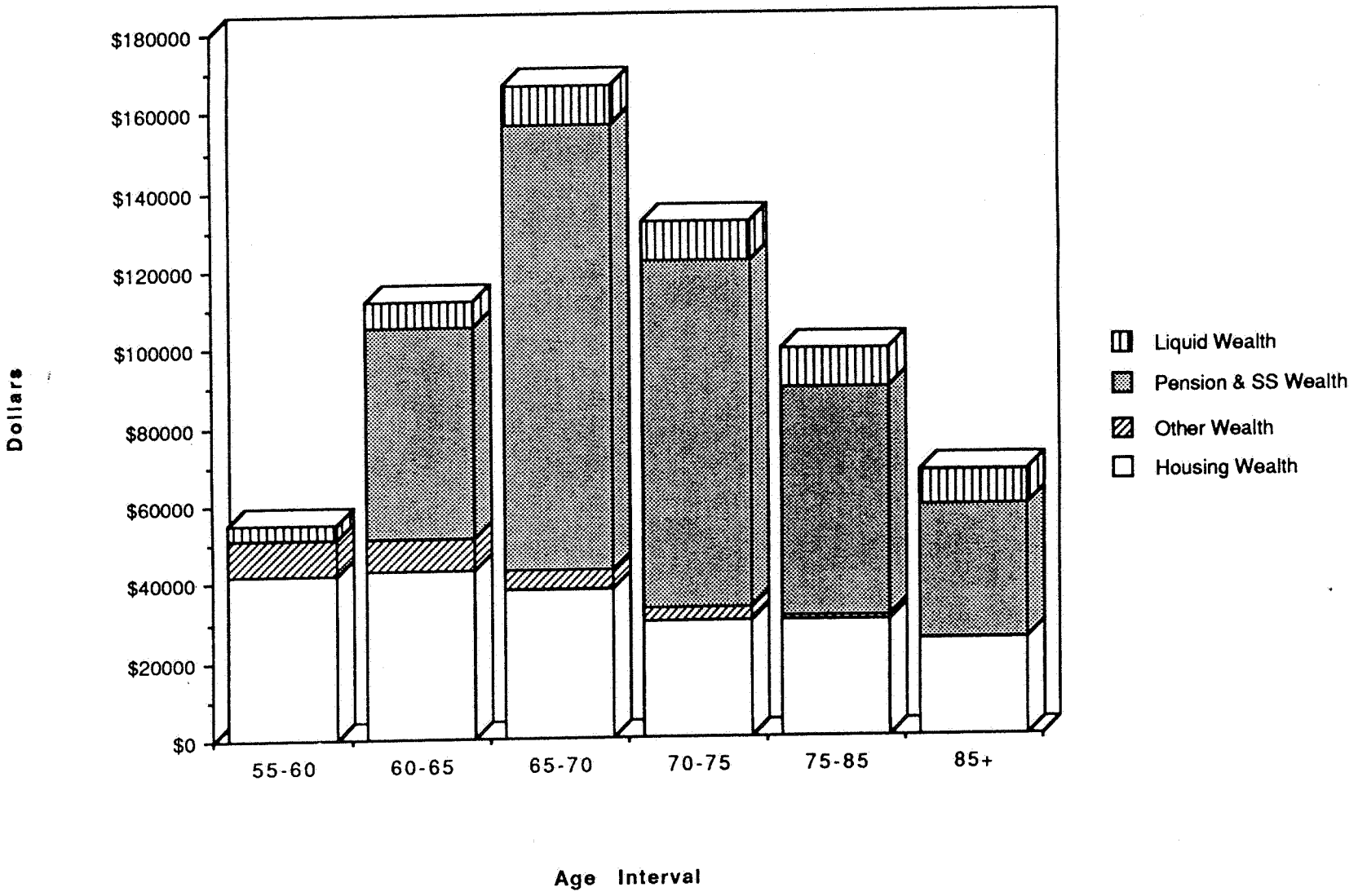


Figure 1b. Median Wealth by Age and Asset Category
All Homeowners

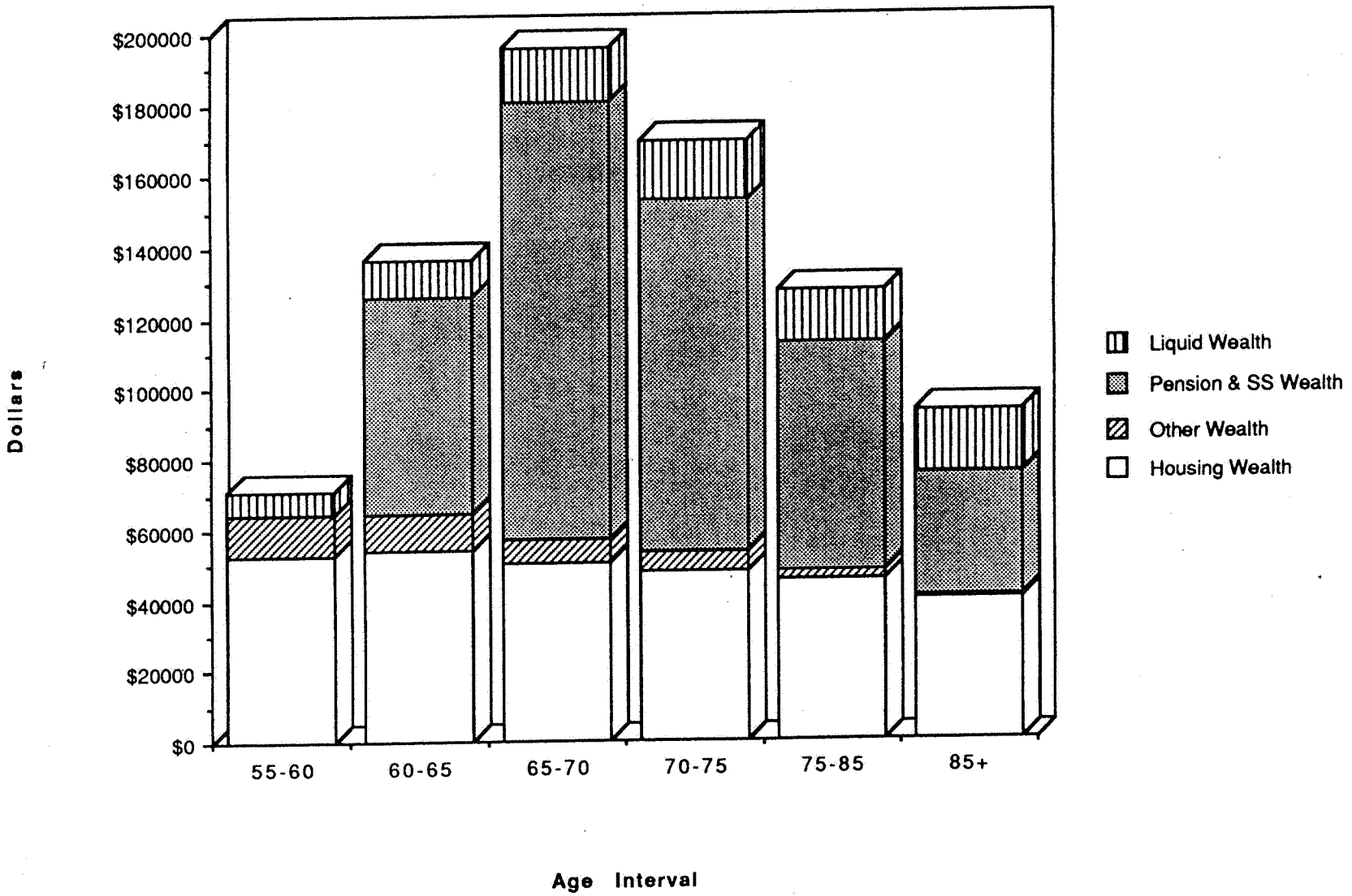


Figure 1c. Median Wealth by Age and Asset Category
All Renters

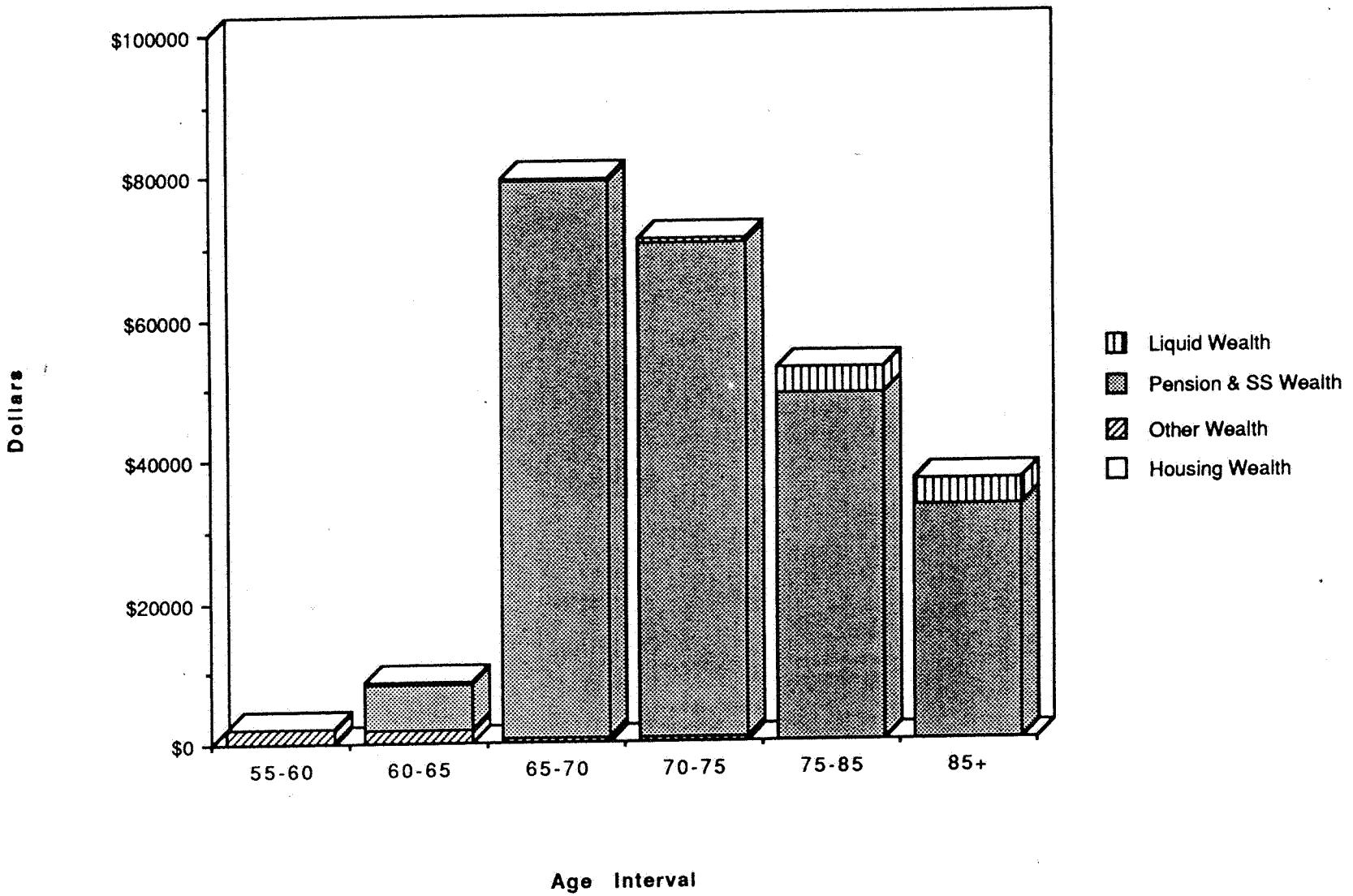
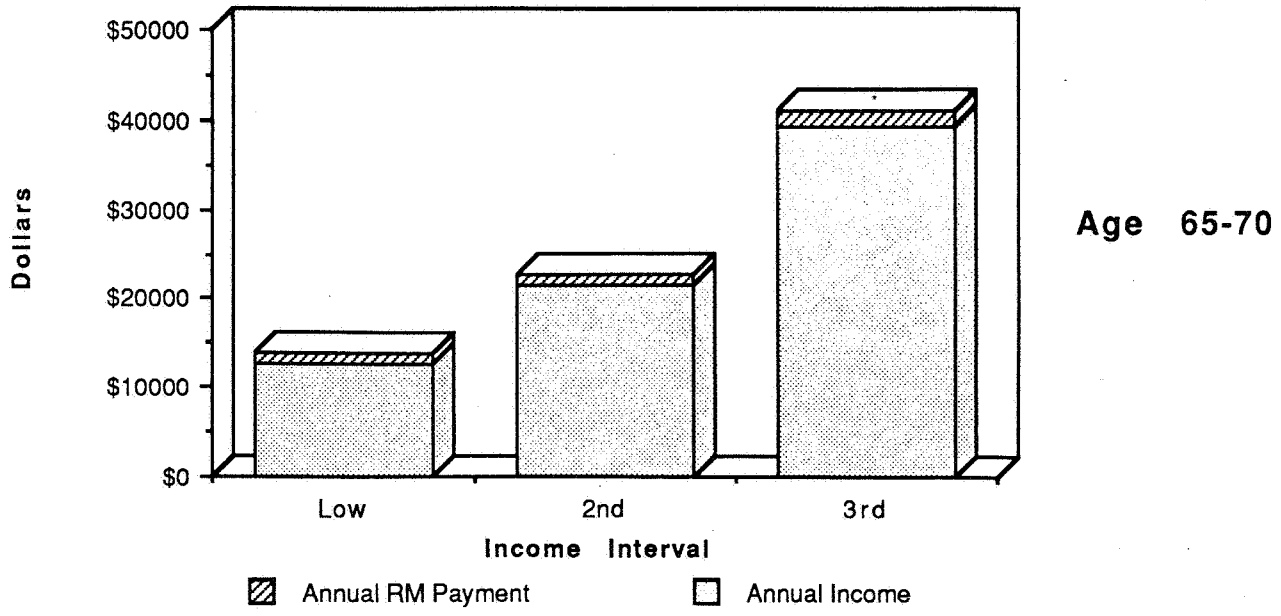
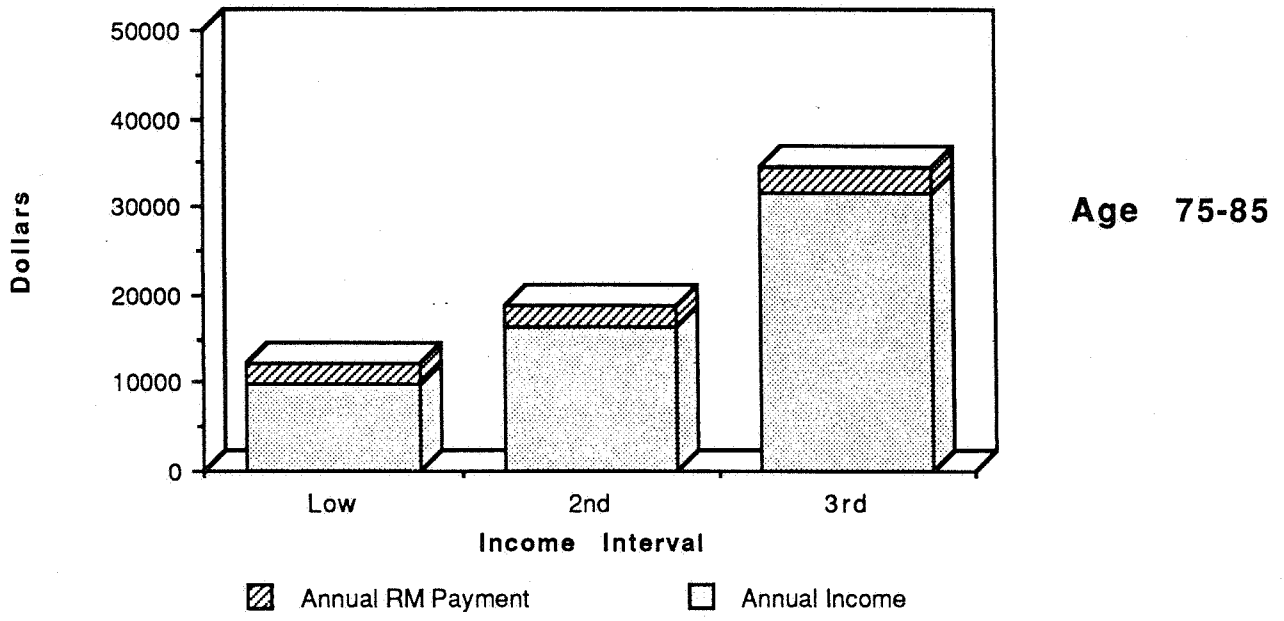


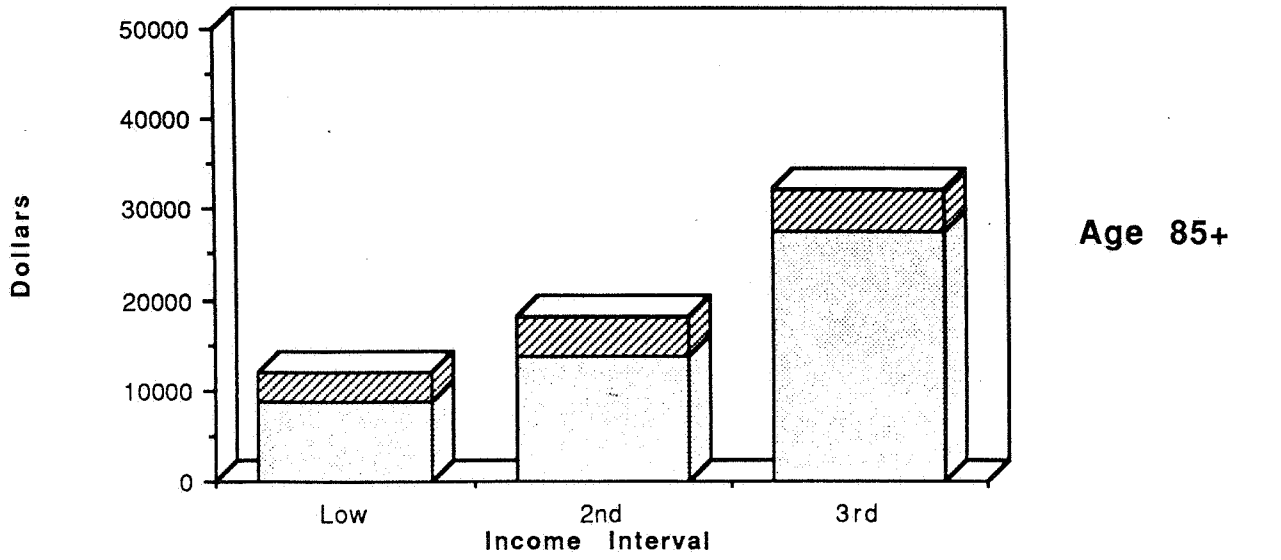
Figure 2a. The Potential Effect of a Reverse Annuity Mortgage Payment on the Median Annual Income of Married Couple Homeowners



Age 65-70



Age 75-85



Age 85+

Figure 2b. The Potential Effect of a Reverse Annuity Mortgage Payment on the Median Annual Income of Single Women Homeowners

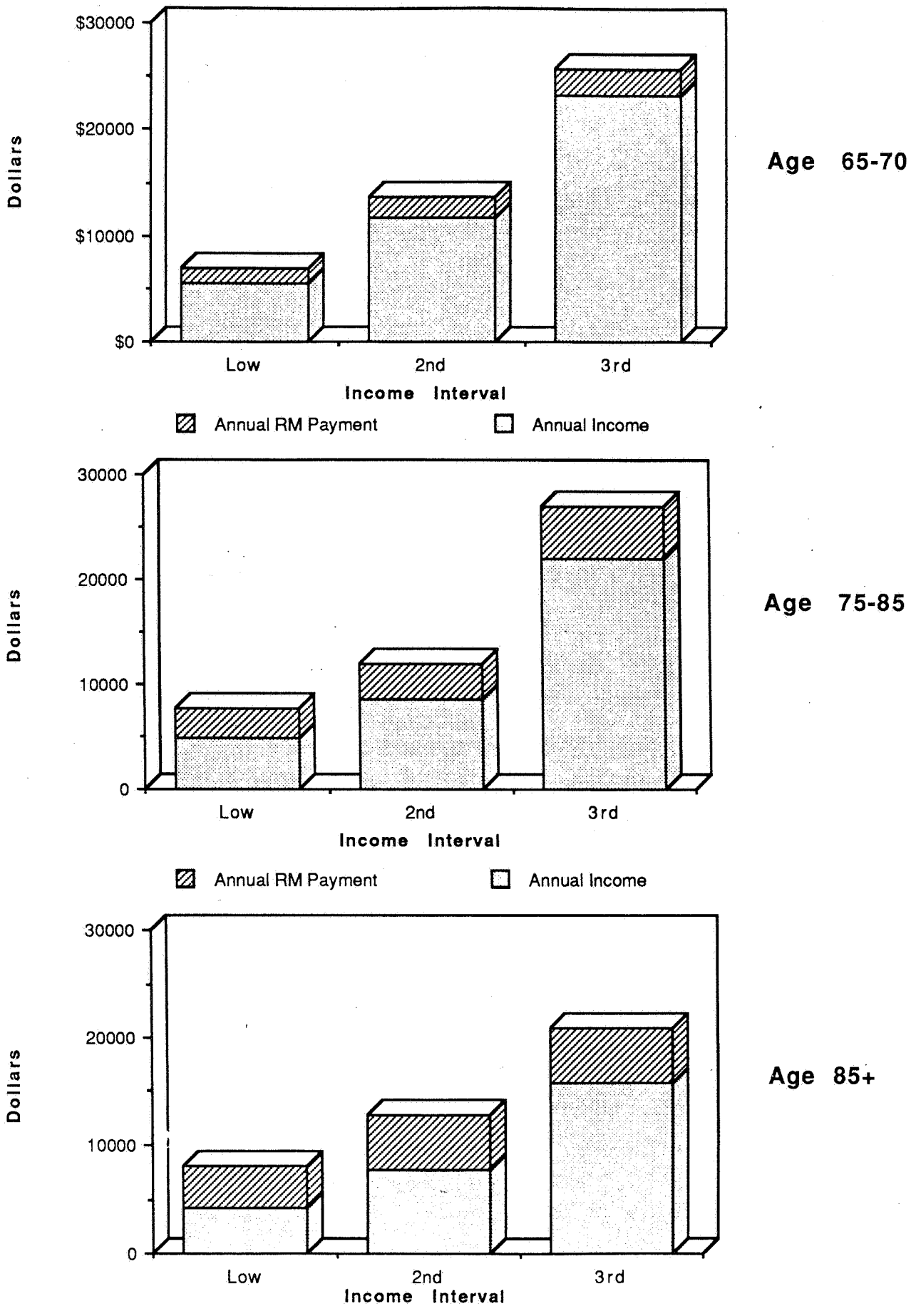


Figure 2c. The Potential Effect of a Reverse Annuity Mortgage Payment on the Median Annual Income of Single Men Homeowners

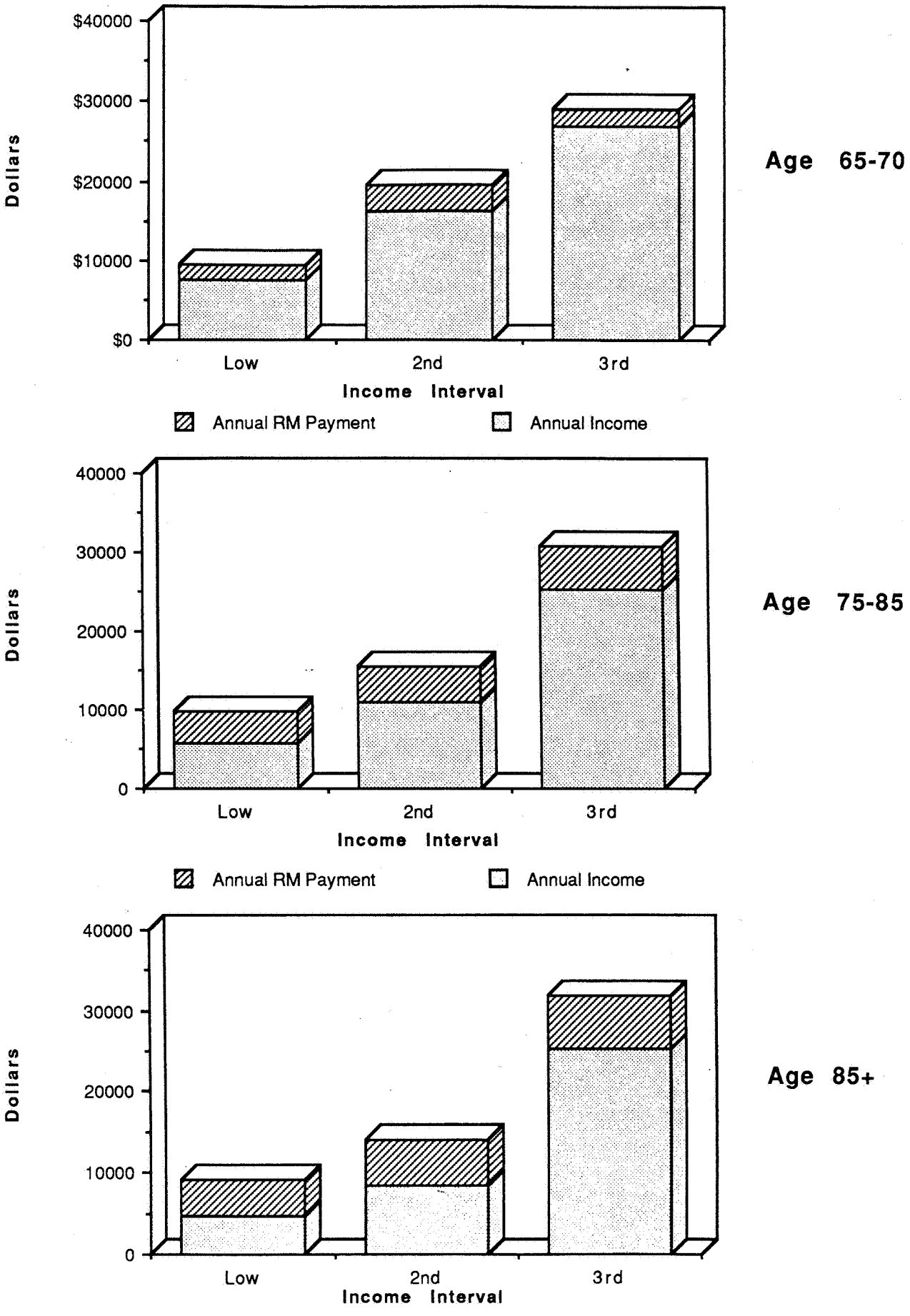


Figure 3a. The Potential Effect of a Reverse Mortgage Lump Sum on the Median Liquid Assets of Married Couple Homeowners

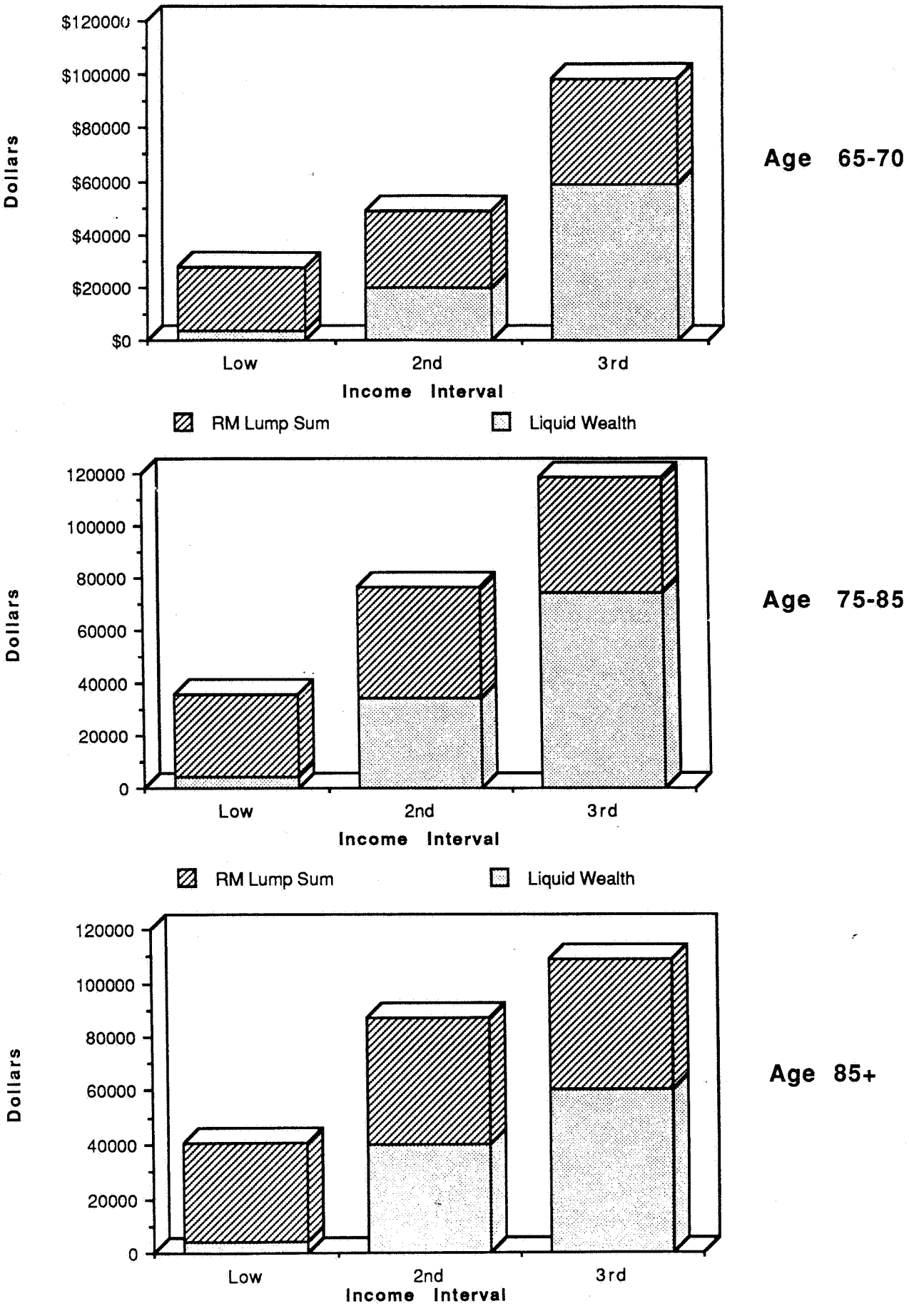


Figure 3b. The Potential Effect of a Reverse Mortgage Lump Sum on the Median Liquid Assets of Single Women Homeowners

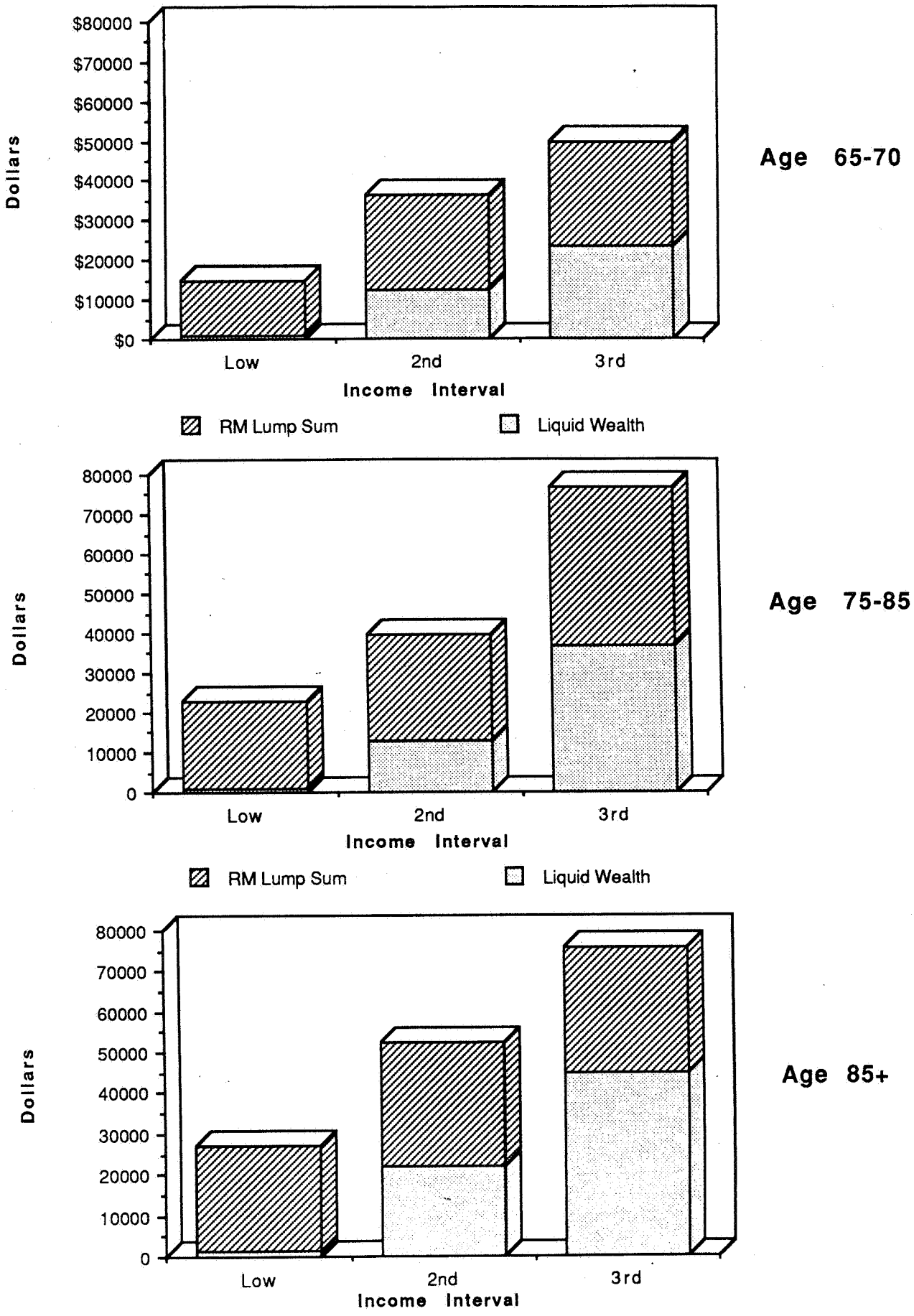


Figure 3c. The Potential Effect of a Reverse Mortgage Lump Sum on the Median Liquid Assets of Single Men Homeowners

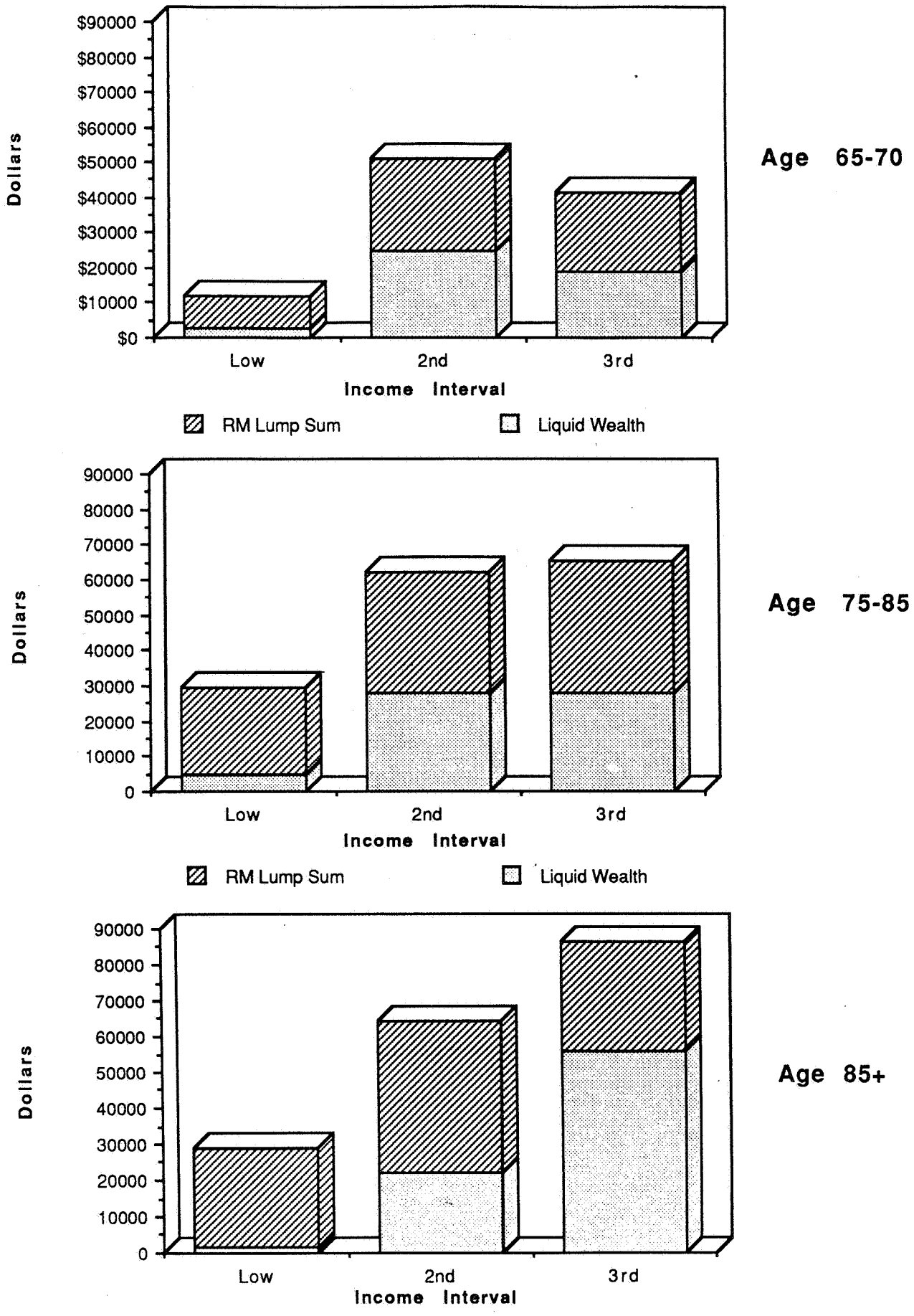


Table 1. Change in Housing Equity by Income and Housing Equity, for All Homeowners (in $000's)

Income	Housing Equity Low	2nd	3rd
	Stayers		
Low	6.6	1.2	-24.6
	(1.2)	(1.5)	(1.9)
2nd	9.3	0.5	-7.8
	(1.5)	(1.3)	(1.5)
3rd	16.6	2.8	-4.6
	(2.0)	(1.4)	--
	Movers		
Low	23.8	10.6	-82.6
	(11.7)	(15.7)	(17.8)
2nd	8.7	-2.8	-32.4
	(14.9)	(15.7)	(12.7)
3rd	70.6	10.2	-6.1
	(19.4)	(12.4)	--
	Net Effect for Movers		
Low	8.3	0.5	-66.9
2nd	-9.5	-11.2	-33.5
3rd	45.1	-1.5	-10.4

Source: OLS estimation of equation (1) in text. The estimated intercept in the stayer equation (μ) is 1.6 with a standard error of 1.2. The estimated intercept in the mover equation (μ') is -8.9 with a standard error of 5.3. Standard errors are in parentheses.

Table 2. Median Housing Equity by Years Owned and Age, Homeowners, 1984.
(in $000's)

Years Owned	Age					
	55-60	60-65	65-70	70-75	75-85	85+
0-3	36.0	45.0	60.0	53.0	65.0	20.0
3-6	40.5	50.0	38.8	50.0	45.7	58.0
6-9	51.5	51.0	56.0	42.5	39.0	40.0
9-12	57.5	53.0	40.0	50.0	40.0	42.5
12-15	62.0	50.5	42.0	41.0	40.0	45.0
15-20	60.0	60.0	51.5	60.0	45.0	35.0
20-25	59.0	62.0	50.0	50.0	50.0	41.0
25-30	50.0	53.0	51.5	60.0	46.0	47.5
30+	50.0	50.0	50.0	45.0	45.0	40.0

Table 3. Analysis of Variance Estimates of Housing Equity by Age and Years Owned, 1984, with Years Owned, Cohort, and Interaction Effects (in $000's)

Years Owned	Age						Years Owned Effect
	55-60	60-65	65-70	70-75	75-85	85+	
			Constant (μ)	57.1 (1.0)			
			Interaction Effect				
0-3	-10.9 (5.6)	-3.4 (6.1)	8.1 (6.1)	8.6 (6.8)	13.3 (7.6)	-15.7 (--)	-1.8 (4.2)
3-6	-4.2 (4.4)	1.1 (4.6)	-5.4 (5.0)	2.0 (5.9)	-1.4 (6.2)	7.9 (--)	-3.8 (3.1)
6-9	3.2 (4.3)	4.7 (4.2)	2.1 (5.2)	-9.9 (5.2)	-1.8 (6.0)	1.7 (--)	0.0 (2.7)
9-12	4.3 (4.4)	0.1 (4.4)	-5.1 (4.8)	-1.3 (5.1)	0.9 (5.0)	1.1 (--)	-0.8 (2.7)
12-15	4.9 (4.0)	-5.3 (4.3)	3.4 (4.4)	2.1 (5.0)	-8.6 (4.4)	3.5 (--)	1.6 (2.5)
15-20	4.4 (3.4)	-1.0 (3.6)	-2.5 (4.0)	3.9 (4.3)	-5.3 (4.2)	0.5 (--)	4.9 (2.3)
20-25	0.0 (3.2)	4.4 (3.2)	-1.0 (3.6)	-1.8 (4.1)	3.6 (4.1)	-5.2 (--)	1.0 (2.0)
25+	-1.7 (--)	-0.6 (--)	0.4 (--)	-3.6 (--)	-0.7 (--)	6.2 (--)	-1.1 (--)
Cohort Effect	4.8 (1.5)	0.2 (1.6)	0.3 (1.7)	1.6 (1.9)	-2.6 (2.0)	-4.3 (--)	

N = 4709

R^2 = 0.022

S.E.E. = 41.1

F (interactions effects = 0) = 1.02

F (interaction and years owned effects = 0) = 1.4

Note: Standard errors are in parentheses.

Table 4. Median Change in Liquid Wealth by Income, Housing Equity, and Non-Housing Wealth, for Homeowners with Heads 65 and Over

	Housing Equity				
	Low	2nd	3rd	4th	All
Income					
Low	-3	0	0	-235	0
2nd	186	0	-351	0	21
3rd	-4	-90	-122	1225	100
4th	-425	-1481	235	-201	-453
All		-17	-65	90	0
Non-Housing Wealth					
Low	0	0	-239	-140	-4
2nd	0	-113	-802	0	-104
3rd	-33	-235	472	297	81
4th	126	197	764	358	355
All	0	-17	-65	90	0

Table 5. Analysis of Variance Estimates of Change in Liquid Wealth, Controlling for Housing Equity, Income, and Interaction Effects, for Homeowners with Heads 65 and Over.
(in $000's)

Income Interval	Interaction: Housing Equity Interval Low	2nd	3rd	High	Income Effect
		Constant (μ)	2.0 (3.2)		
		Interaction Effect			
Low	0.9 (8.7)	1.8 (9.1)	0.9 (10.2)	-3.6 (..)	1.9 (5.8)
2nd	7.8 (9.1)	-2.0 (8.7)	-3.9 (8.8)	-1.9 (..)	1.3 (5.3)
3rd	5.2 (10.1)	0.1 (8.9)	-9.9 (8.6)	4.6 (..)	2.9 (5.3)
High	-13.9 (..)	0.1 (..)	12.9 (..)	0.9 (..)	-6.1 (..)
Housing Equity Effect	-5.4 (5.9)	-0.6 (5.3)	1.1 (5.3)	4.9 (..)	

N = 2113

R_2 = 0.002

Note: Standard errors are in parentheses.

Table 6. Sensitivity of Reverse Annuity Mortgage Payments to Assumed Parameter Values.

m	r	g	Age 65	70	75	80	85
10	5	5	1724	2281	3075	4249	5913
10	10	5	2440	3092	3983	5257	7011
10	10	10	5326	5812	6527	7614	9172

Appendix Table 1. Median Annual Reverse Mortgage Payment, Income, and Housing Equity by Age, Income Interval, and Family Status

Income Interval		Age 55-60	60-65	65-70	70-75	75-85	85+	All
				All Households				
	RM Payment	788	1130	1401	1898	2780	4106	1795
Low	Income	13209	10959	9234	6990	5916	4434	8064
	Housing Equity	39250	43000	37000	35000	32750	31000	38000
	RM Payment	929	1335	1515	2110	3005	4887	1575
2nd	Income	30210	23553	18495	14880	12648	9612	19017
	Housing Equity	52850	50250	49500	48800	45000	40000	50000
	RM Payment	1144	1549	1902	2800	3631	5175	1587
3rd	Income	59217	45246	34491	29586	27384	22710	40236
	Housing Equity	70000	68960	62000	65000	60000	45000	65000
	RM Payment	963	1355	1578	2244	3080	5044	1650
All	Income	30210	23553	18495	14976	12657	9636	19023
	Housing Equity	52500	53800	50000	48000	45000	40000	50000
				Married Couples				
	RM Payment	763	1041	1216	1276	2240	3061	1268
Low	Income	18750	13782	12698	11421	9825	8808	12725
	Housing Equity	44000	50000	40000	40000	40000	36000	44000
	RM Payment	891	1109	1318	1943	2546	4340	1316
2nd	Income	34592	27471	21468	18266	16299	13704	24675
	Housing Equity	55000	50000	47000	54000	50000	45000	50000
	RM Payment	1132	1610	1920	2520	2943	4859	1450
3rd	Income	65577	52785	39203	35127	31566	27450	48618
	Housing Equity	73500	75000	70000	70000	60000	65000	70000
	RM Payment	916	1254	1452	1927	2476	4013	1358
All	Income	34592	27485	21468	18266	16299	14658	24625
	Housing Equity	56500	57000	50000	52000	50000	45000	54000

Appendix Table 1, continued.

Income Interval		Age 55-60	60-65	65-70	70-75	75-85	85+	All
				Single Men				
	RM Payment	1016	2313	1742	3069	4161	4561	3123
Low	Income	4824	8615	7638	7431	5664	4608	6429
	Housing Equity	30000	46300	24500	39950	35000	28000	30500
	RM Payment	2074	1732	3171	2753	4371	5538	2414
2nd	Income	19004	15798	16392	14247	11028	8424	14664
	Housing Equity	56000	37500	55000	35000	40000	34000	40000
	RM Payment	2710	2761	2165	5721	5367	6516	3540
3rd	Income	55563	39174	26991	31653	25296	25287	35040
	Housing Equity	80000	57500	38000	70000	48000	40000	55000
	RM Payment	1635	2230	2141	3536	4904	5701	3128
All	Income	19004	15798	16872	14322	11028	8424	14700
	Housing Equity	47500	50000	38250	47500	40000	35000	43800
				Single Women				
	RM Payment	756	1093	1320	1898	2837	3881	1908
Low	Income	6783	6615	5541	5520	4836	4128	5292
	Housing Equity	30000	33250	32000	32000	31200	30000	30000
	RM Payment	987	1447	2002	2491	3404	5175	2214
2nd	Income	15933	13974	11652	9723	8580	7704	10929
	Housing Equity	38500	49000	46000	42500	40000	40000	42500
	RM Payment	1291	1982	2355	3209	4885	5175	2502
3rd	Income	30117	30420	23328	21269	22031	15768	24048
	Housing Equity	50000	64000	53000	60000	60000	40000	56000
	RM Payment	1016	1480	1885	2501	3636	5175	2214
All	Income	15933	14001	11670	9726	8616	7704	10929
	Housing Equity	40000	47400	45000	45000	40000	40000	43000

Appendix Table 2. Median Reverse Mortgage Lump Sum Payment, Liquid Wealth, and Non-Housing Wealth by Age, Income Interval,. and Family Status

Income Interval		Age 55-60	60-65	65-70	70-75	75-85	85+	All
				All Households				
	RM Lump Sum	14178	18587	19052	21882	25672	29940	21169
Low	Liquid Wealth	1099	2100	3500	3000	2400	1609	3000
	Non-Hous Wealth	37075	100060	109821	81949	53360	29717	78032
	RM Lump Sum	18827	24804	26157	32455	35416	34367	27212
2nd	Liquid Wealth	6087	11305	15012	16525	23674	26758	14999
	Non-Hous Wealth	43092	115601	198037	158357	118244	70840	159593
	RM Lump Sum	27405	32909	36500	47689	44407	62712	33251
3rd	Liquid Wealth	20063	22375	49998	57522	52469	50699	28291
	Non-Hous Wealth	103598	140667	301235	248577	187100	117111	159358
	RM Lump Sum	22385	26267	26667	29222	31548	32367	27096
All	Liquid Wealth	6927	10158	14999	16170	14850	17910	12202
	Non-Hous Wealth	53660	110133	173250	143653	103350	68802	115106
				Married Couples				
	RM Lump Sum	17937	23640	24333	26508	31288	36413	25505
Low	Liquid Wealth	2900	6000	3699	6017	4406	3957	5949
	Non-Hous Wealth	63500	128784	151383	126653	95406	64462	126257
	RM Lump Sum	22169	25575	28772	37664	41723	46528	28217
2nd	Liquid Wealth	7190	11165	20049	21168	34474	40199	19129
	Non-Hous Wealth	43196	107344	226339	191184	159994	109312	183314
	RM Lump Sum	29689	36296	39675	49703	44029	48551	34906
3rd	Liquid Wealth	26579	32600	59099	69350	74450	60000	31950
	Non-Hous Wealth	112128	159320	355638	314708	244415	172121	168887
	RM Lump Sum	24455	28101	29668	33796	35294	36413	29222
All	Liquid Wealth	9540	13724	20150	21100	25319	30700	15183
	Non-Hous Wealth	64678	128855	204361	182052	150061	111085	148295

Appendix Table 2, continued.

Income Interval		Age 55-60	60-65	65-70	70-75	75-85	85+	All
				Single Men				
	RM Lump Sum	13120	22968	9125	25664	24565	27512	22799
Low	Liquid Wealth	0	0	2625	3980	5000	1563	1733
	Non-Hous Wealth	9995	65206	90760	75908	42910	26665	55102
	RM Lump Sum	13576	20488	26128	25434	34341	42482	25434
2nd	Liquid Wealth	12126	6750	25040	14760	28000	21850	15200
	Non-Hous Wealth	44695	155069	161332	117293	84731	63269	110387
	RM Lump Sum	30926	27570	22618	47310	37385	30344	32468
3rd	Liquid Wealth	25208	11300	18639	61000	28000	56000	25510
	Non-Hous Wealth	78850	54412	200290	254364	124690	110847	136091
	RM Lump Sum	20306	25134	21870	31107	31000	28321	26958
All	Liquid Wealth	4275	2000	13750	23000	12500	2800	10183
	Non-Hous Wealth	42565	66675	140552	123039	75321	63269	84032
				Single Women				
	RM Lump Sum	12239	12715	13784	17819	21901	25584	18294
Low	Liquid Wealth	0	508	908	1500	1000	1499	1090
	Non-Hous Wealth	21633	83279	70607	64872	43054	28080	53515
	RM Lump Sum	11335	18290	24072	25616	26566	30548	24065
2nd	Liquid Wealth	2447	5200	12351	12690	13062	22000	11900
	Non-Hous Wealth	21751	108617	138236	109306	79488	60415	103429
	RM Lump Sum	17709	24589	26257	33625	40276	30548	28327
3rd	Liquid Wealth	5100	12300	23548	31468	36571	45030	22447
	Non-Hous Wealth	40312	89934	176997	147637	139267	92787	122471
	RM Lump Sum	14834	19655	21585	24617	28159	30548	22934
All	Liquid Wealth	1450	4284	9320	10780	9700	17888	7366
	Non-Hous Wealth	26361	89037	113424	97929	71692	55458	82177