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THE POVERTY OF WIDOWS: FUTURE PROSPECTS

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ABSTRACT

I estimate the fraction of widows that will be in poverty by projecting the economic status, as measured in 1979, of a cohort of the elderly. The projections are based on an economic model of consumption behavior. I define and estimate a consumption-based measure of poverty status that, I believe, is more appropriate for the elderly than the usual income-based measure.

According to the projections, the fraction of widows in poverty should not incerase substantially as the 1979 cohort ages. However, the fraction in poverty depends critically on the definition: the differences between the consumption- and income-based measures are large. But even more important is the valuation put on Medicare/Medicaid: for two reasonable valuations, the fractions in poverty are very different.

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I. Introduction

Although the economic well-being of the elderly has improved substantially over the past several decades, a high fraction of the elderly, especially of widows, is still in poverty. One might hope that as today's elderly population ages further this fraction will decline because the young elderly come from cohorts with substantially higher lifetime earnings than the cohorts of the old elderly. The purpose of this paper is to study the likelihood this will happen. The approach is to examine a number of the factors that will influence the fraction in poverty, and to forecast how the fraction will change in the future.

One method to forecast the fraction of the elderly in poverty would be to study trends in income, and apply the trends to the incomes of each age group. This would amount to forecasting the future economic status of today's young elderly from the economic status of today's old elderly and from trends in income. But this method is not likely to be reliable for a number of reasons. First, each cohort has had different lifetime earnings and rates of return on their savings: therefore, the current economic status of today's old elderly is probably not a useful guide to the current or future economic status of today's young elderly. Second, the elderly have had substantial changes in Social Security and Medicare/Medicaid whereas both of these programs will probably be stable in the future. Third, changes in mortality rates will mean that poverty rates of the young elderly will eventually be higher

than a trend analysis would indicate. Finally, a trend analysis can only answer a limited number of questions because it is not based on an economic model: for example, it cannot say how the poverty rate would change in response to a change in Social Security because it does not model how the individuals would respond to such a change.

In this paper I forecast the poverty rates of the elderly by using an economic model of consumption. The parameters of the model have been estimated from panel data. The model takes as initial conditions the resources of retirement-aged couples and individuals. Given those resources, the model predicts what consumption will be in each future time period. Thus one can trace out the future path of consumption, wealth and income of each individual and couple. This method has a number of advantages. It is based on observed behavior, and is founded on economic theory. Because it forecasts the consumption of individuals, it provides details on the distribution of consumption, income and wealth, not just on the means. It can be used to study changes in poverty rates in response to changes in the environment. Finally, it can be used to define a consumption-based measure of poverty, that, I believe, is more appropriate for the elderly than the usual income-based measure.

II. Forecasting the Economic Status of the Elderly

The future economic status of a cohort of the elderly depends on initial economic resources, the future economic environment, the

choices the individuals make, and future random events. The problem is simplified considerably if one considers only people who have retired because their economic resources are known: forecasting the future economic status of workers is complicated because the resources of workers depend on future wage growth and labor force participation. Furthermore, many of the elderly have a rather stable economic environment because most of their assets (housing, Social Security and Medicare/Medicaid) are indexed. Indeed, the elderly apparently were better protected against the fall in real income during the 1970s than the rest of the population [Hurd and Shoven, 1983].

In this paper I concentrate on forecasting how the economic status of the elderly changes as a result of their consumption decisions. I take as initial conditions the distribution of resources, ages, and household structure in the 1979 Retirement History Survey (RHS). Using a utility-based model of consumption behavior that I have estimated over ten year of data from the RHS, I forecast the consumption and wealth trajectories of each household in the RHS. Each household will, with a probability that is based on the mortality tables, produce households of different composition in each future period. Thus the number of households defined by composition and assets grows each time period but the weight attached to each type shrinks. From the forecasts, a future population of the elderly is generated. It is the elderly population that would be found in a steady-state economy in which each cohort reaches the age of the 1979 RHS population with the

distributions of assets and household composition of the 1979 RHS. From this standing population I study the distribution of assets, consumption and poverty status at each age. Of course, an alternative statement is that the forecasts are of the 1979 RHS population at each future age.

The method of this paper has the advantage that it distinguishes how much poverty is due to initial conditions and how much is due to life cycle behavior after retirement. It has the further advantage that a consumption-based measure of economic well-being comes naturally from the calculations. This is especially important for the elderly because income, the usual measure, is not a good measure of their economic position: life cycle considerations indicate that at some age they will consume part of their capital. Although wealth is probably a better measure of economic position than income, it is not completely satisfactory either because of the importance of Social Security and other annuities: when they are exogenous it is not obvious how to aggregate them with bequeathable wealth.

The model that is used to forecast consumption and wealth is based on utility maximization under uncertainty about the date of death. The utility maximization problem can be solved for singles but not for couples because the utility function of couples changes depending on the future mortality realizations. Although the consumption model is appropriate for studying the future economic status of the 1979 widows in the RHS, by itself it cannot be used to forecast the poverty status of widows because the couples will

generate new widows as they age, and in order to project the economic status of the new widows, their initial conditions must be known. My ad hoc solution is to assume that couple consume their bequeathable wealth at the average rate that was observed over retired couples in the ten years of the RHS.- This rate was 0.016 per year.

Because the forecasts depend on the quality of the model and the parameter estimates, I discuss in the Appendix the specification and estimation of the economic model. More details can be found in my paper "Mortality Risk and Bequests." Here I briefly outline the ideas behind the consumption model.

Suppose a retired individual wants to maximize lifetime utility when the date of death is uncertain. Utility depends on consumption each time period and on any bequests he might leave should he die. Economic resources are initial bequeathable wealth, and annuities, which include Social Security, Medicare/Medicaid, and private pensions. It can be shown that the solution to this utility maximization problem implies that desired consumption will depend on the parameters of the utility function, mortality rates, bequeathable wealth, the entire time path of annuities and the strength of the bequest motive. I used the solution to the utility-maximization problem along with data from the ten years of the RHS to estimate the parameters of the utility function. Given the parameters, the economic resources and the utility-based model, I can forecast the future consumption and wealth paths of each individual in the RHS.

III. Forecasting Consumption and Wealth

The consumption and wealth of each single person in the 1979 RHS can be projected given the estimated model and initial conditions by solving equations (5) of the Appendix. The initial conditions are real annuities, which include Social Security benefits and Medicare/Medicaid, nominal annuities, which include pensions, bequeathable wealth, and the path of mortality rates which are defined by age, race and sex. There are two types of solutions depending on which of the parameter estimates are used in the solution. As explained in the Appendix, the different sets of parameter estimates come from different estimation methods. The first type of solution which I call the NLLS solution is illustrated in figure 1. The second type which I call the NL2SLS is shown in figure 2. The NLLS path of consumption quickly falls so that bequeathable wealth is exhausted for most people at an early age. The NL2SLS path of consumption is much flatter and wealth lasts to a greater age. Regardless of which estimates are used, the wealth and consumption paths of all the 1979 single people will, when weighted by the probabilities of living, give the expected distributions of wealth and consumption not only at each year but also across years.

Table 1 shows, for the 1979 RHS widows, the means and medians of consumption, wealth and income every two years from 1979 through

1999.[1] Part A, based on the NLLS estimates, has consumption and wealth paths like those of figure 1. The widows are poor to begin with, and rapidly become poorer. By 1989 median bequeathable wealth has fallen to zero, so that at least half of the surviving widows will live from their annuity income only. By 1999 mean bequeathable wealth is essentially zero; therefore, all observations will have exhausted their bequeathable wealth.

Regardless of what the definition of poverty is, it is obvious that, according to these projections, these surviving widows will be poor. It will be useful, however, to make an estimate of the fraction in poverty in each year. The BLS defines poverty according to observed income. For the elderly there are at least two weaknesses to this definition. First, if the rate of inflation is positive, using nominal income from capital implies real capital decumulation because the interest rate that is used to calculate the income is nominal. Thus, the welfare implications of nominal income are obscured. Second, according to the life cycle hypothesis income of the elderly is not a good welfare indicator because some wealth should be consumed at advanced ages. I use two measures to calculate the fraction below poverty. The first, an

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[1]I include housing wealth in these simulations because the simulations should give a good idea of the economic status of the elderly. A reasonable supposition is that housing wealth declines over long periods at the same rate as other bequeathable wealth. An alternative method would be exclude housing wealth from the simulations, and to impute a consumption value to the stock. The parameters used in the forecasts are those from the NLLS estimation.

income-based measure, is the sum of annuities and real income from capital. I use a real rate of 0.03. The second is consumption. For singles consumption is estimated from the utility model. For couples, consumption is the sum of annuities, real income from capital and the change in capital. Because of the ad hoc assumption about the trajectory of the capital stock of couples, the estimate of consumption for couples reduces to the sum of annuities and 4.6% of capital. I take the poverty levels to be those given by the BLS: $3479 for one person over the age of 65, and $4388 for two persons over the age of 65, both figures in 1979 dollars.

Any measure of the welfare of the elderly must address the problem of placing a value on Medicare/Medicaid. The program certainly is of some value: were there no such program, the elderly would spend more of their own wealth on medical care. Rather than speculate about the value, I present two sets of consumption and income measures. The first follows Hurd and Shoven [1983]: it includes a value roughly equal to the average transfer through the Medicare/Medicaid system to each eligible person. The idea is that the transfer is the value of a fair medical insurance policy which is given each year to those eligible. The second set of results excludes any valuation for Medicare/Medicaid.

According to the income-based measure of poverty that includes Medicare/Medicaid, the fraction of 1979 RHS widows in poverty begins at a high level and rises slowly as wealth is decumulated. It eventually reaches 38%. Because mean wealth is zero, the

fraction in poverty will not change further: all the widows that are below the poverty line will remain in poverty and all above will remain out of poverty. The consumption-based measure shows the fraction in poverty starting at a modest level but eventually reaching the same point as the income-based level. This happens, of course, because when bequeathable wealth is exhausted, consumption equals annuity income.

If Medicare/Medicaid is excluded the results change substantially: the fractions in poverty are much higher at the beginning, and they reach very high levels. Again, however, there are large differences in the early years between the consumption-based and income based measures.

Part B of table 1 gives projections based on the NL2SLS parameter estimates. Typical consumption paths are shown in figure 2. The consumption paths are much flatter and more wealth is held than the paths based on the NLLS parameter estimates. This means that initially the consumption-based measure of poverty will show a higher fraction in poverty, but at more advanced ages the fraction in poverty will be smaller. The average fraction in poverty over all age groups is about the same.

The projections of the 1979 RHS widows do not give any idea of the economic status of a steady-state population of widows because the composition only changes by the mortality of the widows. In that couples are substantially more wealthy than widows, the mortality of husbands will add new widows that are more wealthy than the original widows. Because I do not have a utility-based

model of the consumption decisions of couples, I take their wealth decumulation to be 1.6% per year, which is the average of all couples over the ten years of the RHS. Each time period each couple will generate three other households: a widow, a widower, and a couple, each with a probability that is calculated from the mortality tables. The new widows and widowers have initial conditions that are related to the wealth and annuities of the couple from which they came. The situation is shown in figure 3. For example, a couple in 1979 will generate four additional households by 1984 each of which will have a different wealth level because each is identified by the sex of the survivor and the date of creation.

I make some assumptions about changes in bequeathable wealth and annuities if the husband dies. All nominal annuities are lost: this is roughly confirmed in the RHS data; apparently most nominal annuities are pensions without survivors benefits [Hurd and Wise, 1987]. Human capital is lost as it is almost exclusively due to the husband's working. Social Security benefits become 0.67 of their former level, which assumes the family's benefit is based on the husband's earnings record. Medicare/Medicaid becomes half of its former level. I give two sets of results each based on different assumptions about bequeathable wealth. In the first set I assume that bequeathable wealth decreases by 32% when the husband dies. This is the average figure over the ten years of the RHS [Hurd and Wise, 1987]. In the second set bequeathable wealth does not change at the husband's death.

Table 2 gives medians and means of consumption, income and wealth of couples from 1979 through 1999. Because these results are mostly used to generate initial conditions for the projections of the singles, and because they are so heavily dependent on the assumptions of the ad hoc model, I will only discuss them briefly. In the first panel, both consumption and income include an imputed flow from Medicare/Medicaid; in the second panel the flow is excluded. Even for the very oldest couples, consumption and income including Medicare/Medicaid are substantial both at the mean and median, and the fraction in poverty is small. Excluding Medicare/Medicaid increases somewhat the fraction in poverty, but the general impression is that couples are reasonably well off.

As shown in table 3, the results for widows when the composition is allowed to change due to the mortality of husbands are very different from the projections of the 1979 RHS widows: income, wealth and consumption are much higher especially among older widows, and the fractions in poverty much lower. The reasons are that in each time period the widows who are added at the husband's death have much higher bequeathable wealth, even after the reduction for the wealth destruction at the husband's death, than the 1979 widows, and the new widows have substantially higher levels of Social Security benefits, even after reduction, than the 1979 widows.

Table 3, Part A, shows that in the first few years, consumption that includes Medicare/Medicaid is somewhat lower than couples, but income and wealth are substantially lower. This is,

of course, a reflection of the much faster consumption of capital by singles than by couples.[2] In later years, consumption by widows is only about half that of couples at the median. The fraction of widows in poverty according to the consumption-based measure starts at a rather low level and rises to 20% by 1999. By then the median age of the widows is 89, and, even though the mortality rate of the widows is high, there are still a sizable number of widows because almost all of the husbands have died. According to the income-based measure of poverty, the fraction of widows in poverty actually falls. This is caused by the high level of Social Security added by the new widows.

Even though the new widows have higher bequeathable wealth than the original widows, the median wealth holdings become zero by 1993, so that at least half of the widows will live off of Social Security and Medicare/Medicaid.

In the standing population of widows the fraction in poverty is 17.6% based on the consumption measure and 24.6% based on the income measure. These fractions were found by taking a weighted average of the fractions in poverty in each year.

When Medicare/Medicaid is excluded from the income and consumption measures, the results change substantially: both income and consumption drop by about $1,000 as that is roughly the per person transfer amount imputed to the Medicare/Medicaid system.

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[2]Couples should decumulate wealth at a slower rate than singles because the life expectancy of the household is greater.

The fractions in poverty rise sharply especially at older ages: both for the consumption-based and income-based measures, the fraction in poverty in 1999 almost doubles. In the standing population, the fraction in poverty increases to 30% by the consumption measure and to about 43% by the income measure. Apparently a substantial number of widows have income and consumption near the poverty line, so that a fairly small change causes a large number to fall below the poverty line. This is illustrated in table 5, which gives the consumption distributions in 1983. Because the value of Medicare/Medicaid is large relative to the poverty line, many widows are shifted into poverty by excluding Medicare/Medicaid. Both the thickness of the distribution of widows near the poverty line and the shifting indicate the rather artificial nature of the official classification into poverty. In particular, if one want to attach welfare significance to the poverty level, more research needs to be done on the valuation of Medicare/Medicaid.

Table 3, Part B, has the projections based on the NL2SLS parameter estimates of the steady-state population of widows. As measured by consumption the time path of the poverty rate is changed substantially: there is much more poverty at earlier ages and much less later. As measured by income there is less poverty overall because more wealth is held. This points out again the weakness of an income-based definition of poverty: the population appears to be better off even though they have consumed less. Although bequests at the death of the widow are not shown directly

here, the results imply higher bequests simply because at each age more wealth is held. That is, even among poor widows the NL2SLS consumption paths imply that less wealth is consumed and more bequeathed.

Table 4 gives results similar to table 3 except I have assumed that no bequeathable wealth is lost at the husband's death. In that the differences between tables 3 and 4 are about the same for each estimation method, I will not discuss separately parts A and B. Of course, because bequeathable wealth is not lost at the husband's death, consumption, income and wealth are higher. The largest changes are at mean levels because of the skewed distribution of bequeathable wealth. In fact there is very little change in the poverty levels: those close to the poverty level have very little bequeathable wealth; thus, it matters little whether bequeathable decreases by 32% at the husband's death or not.

Because the projections generate a complete distribution of couples and widows, a poverty rate over both groups is found by taking a weighted average. The rates based on the results of tables 2 and 3, Part A, are

	Poverty Rates	
Medicare/Medicaid	Income-based	Consumption-based
Included	17%	12%
Excluded	31%	22%

The table shows again the importance of Medicare/Medicaid. The difference between the consumption-based and income-based measures

are not as large, but it should be remembered that the consumption of wealth by couples is not based on a utility model.

IV. Forecasting Consumption and Wealth in a Dynamic Economy

In Section III, I traced out the consumption and wealth paths of the 1979 RHS population under several different assumptions about the parameters that determine their consumption choices and about the loss of wealth at the husband's death. In this section I forecast what the economic status of the elderly will be at the turn of the century, and how it will be affected by changes in the economy. As a standard of comparison, I first present a base case in which the economy is static. Then I forecast successively how the economic status will change when there is growth in bequeathable wealth, growth in Social Security benefits, growth in and change in the structure of job-related pensions, and change in mortality rates. Because the calculations are so extensive I only estimate the economic status of every fourth age group (71 year olds, 75 year olds, 79 year olds and so forth), but taken together they seem to give a good representation of the entire population over the age of 70. In all the remaining forecasts I use the NLLS parameter estimates because they fit the sample period data slightly better than the NL2SLS parameter estimates. In consonance with the actual data, I assume wealth loss of 32% at the husband's death.

Table 6 has the base-case forecasts of the consumption, income and wealth of elderly couples in the year 2003. The first line is

the forecast for the 1979 RHS couples; the husbands were about 71 years old in 1979, the wives about 69 years old. Initially there were 2418 couples; according to the 1979 mortality tables by 2003 there will be just 16 surviving couples. The mean age of the husbands will be 94.1 years and of the wives 91.5. According to the forecast, mean wealth of the 16 couples in 2003 will be $60,890 in 1979 dollars. Annual consumption and income, including an imputation for the value of Medicare/Medicaid will be $11,638 and $10519, respectively. The other entries in the first line are consumption and income, excluding any value for Medicare/Medicaid, and estimates of the fraction in poverty.

The second line of table 6 has the forecasts of the economic variables in 2003 of the couples who were about 70 years old in 1983. Their initial economic positions in 1983 are taken to be the same as the 1979 RHS couples except that the inflation forecast is based on 1983 inflations rates rather than 1979 rates. Thus, the forecasts in lines 1 and 2 differ only because the 1979 and 1983 inflation rates differ, and because the forecasts are over 20 years rather than 24. Of the initial 2418 couples, 79 will survive until 2003. The mean age of husband and wife will be 90.4 and 87.9 years respectively.

When the base year is 2003, the forecast begins and ends in 2003; thus, the entries in that line are the actual data of the 1979 RHS couples. The data represent the economic status of the couples who will be about 70 years old in 2003.

Taken together the lines give an estimate of the wealth, consumption and income of couples in 2003 under the assumption that

in each base year, couples reach approximately 70 years of age with the distribution of assets that the 1979 RHS couples had. The last line gives average values over all the age groups. Average consumption and income levels are quite high. When Medicare/Medicaid is included in consumption and income, the fraction of couples in poverty averaged over all the age groups is small, 2% according to the consumption measure and 3% according to the income measure. If Medicare/Medicaid is excluded, the fraction in poverty rises to 7% and 9%. These fractions are about what would be found in the official poverty statistics for elderly couples: in 1983, 8.1% of families with heads over 65 were in poverty. Of course, the official measure and the measures used here are based on different assumptions, but apparently the return to housing that is included here roughly offsets the lower rate of return on wealth that is used here. I would argue, however, that at least from a theoretical point of view the measures proposed in this paper are more appropriate. In any event, by these measures the future economic status of elderly couples seems good even if there is no upward trend in the initial economic position of the cohorts as they reach retirement age.

Table 7 has the projections for all singles, which include widows, widowers and original singles. The table includes compositional changes caused by the mortality of both husbands and wives. To simplify the discussion, I concentrate here, and in the results to follow, on the results that exclude Medicare/Medicaid. Singles have much lower wealth than couples: averaged over all

ages their wealth is only 21% of the wealth of couples. Their income is about half the income of couples because Social Security, which is a very important component of their income, is much more evenly distributed than wealth. Consumption by singles averages 70% of the consumption of couples. This is a consequence of the much more rapid decumulation of wealth of singles. Mortality differentials suggest this is reasonable: a couple will survive, possibly not intact, for much longer than a single, so it should reduce more slowly its wealth. Even though average consumption by singles is quite high, a large fraction of singles is in poverty. Apparently the distribution of consumption is highly skewed. The results also point out again the important difference between an income-based and a consumption-based measure of poverty: at the youngest age the income-based definition has twice as many in poverty as the consumption-based definition. According to the income-based definition of poverty, the incidence of poverty is much higher than the official statistics indicate: in 1983 the official poverty rate for unrelated individuals over the age of 65 was 22% for men and 28% for women. The corresponding figure in table 7 is 41%, the average poverty rate based on the income measure of poverty.

At older ages wealth becomes small, and, of course, average consumption approaches average income. The fractions in poverty in the oldest group are almost the same by either measure which implies that a large fraction of the population of singles have no remaining bequeathable wealth.

In the rest of the forecasts I change the initial conditions of the successive cohorts to reflect economic changes or changes in mortality. I first consider the growth in bequeathable wealth that would accompany steady economic growth. According to Wolff and Marley [1987], real average household wealth, excluding claims to pensions and Social Security, grew by about 2% per year from 1949 to 1983. I take this to be the expected growth rate in initial bequeathable wealth of the retirement-age elderly. In principle, the economic status of the elderly in 2003 would be found as follows. The consumption and wealth of 95 year olds in 2003 would be forecast by the economic model from the initial conditions of the 71 year-olds in the 1979 RHS population. To find the consumption and wealth of 94 year-olds in 2003, I would increase the bequeathable wealth of the 71 year-olds in the 1979 RHS population by 2%, and forecast from 1980 to 2003 their consumption and wealth. This would represent the consumption and wealth in 2003 of the cohort that reached 71 in 1980. Increasing again initial bequeathable wealth by 2% and forecasting from 1981 to 2003 will yield the distributions of consumption and wealth of 93 year-olds. Successively changing in this way the initial retirement-age conditions would generate the consumption and wealth in 2003 of all cohorts that will be 71 through 95 years old in 2003. Because of the highly nonlinear response of consumption to changes in bequeathable wealth, the resulting distributions of consumption and wealth are not simple geometric projections of the original forecasts.

To reduce the very extensive computations I increased the initial bequeathable wealth of each couple by $(1.02)^4$ every four years, and began the forecasts at each of the years 1979, 1983, 1987 and so forth, as in table 6. The results, which represent the economic status of couples in the year 2003, are given in table 8. Because the increases began after 1979 the oldest cohort has exactly the same economic variables as in the base case. Of course, the greatest change is found in the youngest cohort: average wealth is 59% higher than in the base case. Because most couples are young, wealth changes averaged over all ages are also large, about 46%. Mean consumption, excluding Medicare/Medicaid, is 16% higher; mean income is 11% higher. The large differences between the wealth increase and the consumption and income increases reflect the important role annuities, especially Social Security, have in consumption and income. The fractions in poverty, which were already low in table 6, are reduced slightly.

Table 9 has the forecasts for singles under growth in the bequeathable wealth of both couples and singles. A comparison with table 7 shows substantial growth in wealth: over all ages wealth increases by 55%. Excluding Medicare/Medicaid, average consumption is 19% higher; average income is 6% higher. Poverty levels are not changed by much because most people near the poverty line have little bequeathable wealth, so that proportional increases in wealth have little effect. Furthermore, the older elderly are not appreciably affected; yet, they both have high poverty rates and comprise a sizable fraction of the singles. The conclusion from

these simulations is simple geometric growth in bequeathable wealth will not yield large improvements in the poverty rate of singles over the next 30 years. One must hope that economic growth cause more than a proportional change in bequeathable wealth at retirement.

In a growing economy one would expect increasing productivity to cause increases in Social Security benefits: as real wages increase, real Social Security taxes and real Primary Insurance Amount (PIA) will increase. It is difficult to know what a reasonable assumption is for increases in real PIA. In line with the results of Wolff and Marley on household wealth, I assume a growth rate of 2% per year, although due to the progressivity of the benefit schedule and the cap on taxable earnings, this may be an overestimate of the effect on PIA. The next two tables have simulations that incorporate the 2% growth in PIA.

With a growing PIA the youngest of the cohorts will have much higher Social Security benefits than the oldest cohorts. Of course, because the assumption is on PIA, once an individual's Social Security benefits are fixed, he will have no future increase in benefits. Results for couples are in table 10. Comparison with table 6 shows much higher income and consumption on average, which is a reflection of the importance of Social Security benefits in the economic resources of the elderly. Social Security growth reduces the fraction in poverty: very few remain in poverty except amoung the oldest cohort, which under this experiment, had no increase in benefits.

Table 11 has the corresponding results for singles. The increases in income and consumption are substantial in the youngest cohorts, and poverty falls by more than 50%. Averaged over all age groups, the fraction of the population in poverty falls from 41% to 26% according to the income measure. Average wealth is almost unchanged: the increase in benefits is roughly completely consumed. This result has two sources: according to the model, when annuities increase, the rate of consumption from bequeathable wealth increases; and the effect of a bequest motive is small.

In a growing economy one would expect job-related private pensions to increase. In the next simulations each cohort reaches retirement age with pensions that are 2% higher than the preceding cohort. Once the pension of an individual has been fixed, it remains constant in nominal terms as he ages. In addition the assumption about the survivorship rights to private pensions has been changed: when the husband dies the widow receives 2/3 of the pension. To make the pension actuarially fair, the pension of the couple is reduced to 89% of its value when there are no survivorship rights.

Table 12 has the results for couples. The changes are very small: consumption and income increase by about 2%. One reason for the small change would be that pensions are not a very important source of income for the RHS population: the large increase in the private pension system happened after most of the RHS population had retired. Another reason is that the 2% per year growth in pensions is partly offset by the actuarial reductions of 11%.

As table 13 shows, the changes in pensions cause very small changes in the consumption and income of singles, an increase of about 2%. Again this is a reflection of the fact that pensions are not an important income component of the RHS population. Furthermore, average consumption and income only change when new widows are added to the singles population, not when new widowers are added; apparently the rate of addition is not great enough to affect the averages by much. The fraction in poverty is not changed: survivors near the poverty line typically come from families with almost no pensions. Thus, changing the survivorship rights will have little effect on the poverty rate.

Changes in mortality have a number of effects in this model: the rate of transition from couples to singles changes; the mortality rates of singles change; and the consumption paths of singles change. To investigate these effects, I substituted for the 1979 mortality table, an estimated mortality table for the year 2000. Table 14 has these new results for couples. Comparison with table 6 shows that the mean age increases by about 0.6 years and the number of households by about 12%. The effects on the oldest households are larger: the fraction of the elderly population in the three oldest catagories increases from 5.6% to 9.1%. Even though more of the population lives longer, the fraction in poverty increases only slightly, and the mean wealth is only marginally lower.

Table 15 has the corresponding results for singles. The mean age increases by 0.6 years; the number of households by 11%. The

fraction of the single population in the three highest age groups increases from 26% to 32%. Average wealth declines only slightly. The fractions in poverty increase marginally: by 1% according to the income-based measure and by about 2% according to the consumption-based measure. The increase in life expectancy causes little change in annual income: it drops by 1%. Consumption, however, drops by almost 10%. The difference in these changes points out, again, that income is probably not a good measure of the economic well-being of the elderly. The large change in consumption that results from using mortality tables that are just 21 year apart indicates the importance of accounting for the reactions of individuals to mortality changes. This cannot be done in forecasting methods that simply rely on trends: those methods can only change the age and marital status distributions in response to changes in mortality rates.

V. Conclusions

The widows in the 1979 RHS had little wealth and, according to my projections, they quickly became even poorer. Thus, the future prospects of the 1979 RHS widows are not bright. When the population of widows was allowed to change as husbands died, the extent of poverty was substantially less. The future prospects of the population of widows that would be generated in steady-state by the 1979 RHS sample of widows and couples are much better. A critical unresolved issue, however, is the measurement of poverty. I presented four measures, and they gave substantially different

fractions in poverty. Over the steady-state population of couples and widows, the measures range from a low of 12% to a high of 31%. The welfare consequences are quite different at these extremes. For widows, the variation is even greater. The poverty rates of widows based on the results in table 3, Part-A, are

	Poverty Rates of Widows	
Medicare/Medicaid	Income-based	Consumption-based
Included	25%	18%
Excluded	43%	30%

Thus, the variation is from 18% in poverty to 43% depending on the definition. As between the income-based and consumption-based measures, I certainly prefer the consumption-based measure: the income-based measure gives no weight whatsoever to the stock of wealth that is consumed. As between the measures that include and exclude Medicare/Medicaid, the correct choice probably is, as usual, neither, but something in between.

In the second set of forecasts, the assumptions about economic growth and mortality rates were varied to estimate the economic status of the elderly population at the turn of the century. Even without economic growth, elderly couples seem secure through the end of the century: the young elderly couples have enough assets and claims to Social Security that only a small fraction can expect to be in poverty. The prospects of singles, most of whom are widows, are not nearly so bright: on average they can expect to have low wealth and a high incidence of poverty. This is especially true of those who will be very old by the turn of the

century: their economic resources are already fixed, and unless there is an across-the-board increase in Social Security benefits, little can happen to change them. If there is an increase in productivity leading to higher Social Security benefits, the young elderly will benefit considerably by the turn of the century. Under such an assumption, poverty rates amoung that group can be expected to be low.

The projections produced four measures of economic well-being with substantial differences among them. They are summarized in the following table, which gives poverty rates over the 2003 population of elderly. These rates are calculated from the rates found in tables 6 and 7.

	Poverty Rates of the Elderly Population in 2003	
Medicare/Medicaid	Income-based	Consumption-based
Included	17%	12%
Excluded	31%	22%

The variation in poverty rates is from 12% in poverty to 31% depending on the definition. Again, I would prefer the consumption-based measure, and, again, the differences between the measures that include and exclude Medicare/Medicaid are substantial and point out the need for more research into a reasonable valuation of Medicare/Medicaid.

Appendix[3]

I assume that individuals maximize in the consumption path $\{c_t\}$ lifetime utility

$$(1) \quad \int U(c_t)e^{-\rho t}a_t dt + \int V(w_t)e^{-\rho t}m_t dt$$

in which

$$U(c_t) = c_t^{1-\gamma}/(1-\gamma), \text{ and}$$

$$a_t = 1-\int_0^t m_s ds$$

is the probability that the individual is alive at t; m_t is the instantaneous mortality rate. ρ is the subjective time rate of discount; r is the real interest rate which is taken to be known and fixed; V(.) is the utility from bequests. This formulation of utility maximization with bequests is due to Yaari [1965]. The resources available are bequeathable wealth, w_t, and annuities, including pensions, Social Security and Medicare/Medicaid. Annuities are distinguished from bequeathable wealth in that they cannot be borrowed against, and are not bequeathable. The conditions on the utility maximization are that initial wealth, w_0, is given, and that

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[3]This section is drawn from my "Mortality Risk and Bequests."

$$(2) \quad w_t = w_0 e^{rt} + \int_0^t (A_s - c_s) e^{(t-s)r} ds \geq 0 \text{ for all } t .$$

A_s is the flow of annuities at time s. This formulation differs from the usual intertemporal utility maximization problem in that the annuity stream cannot be summarized by its expected present value. It turns out, because many of the elderly have large annuities relative to their bequeathable wealth that the corner solutions are important. I parameterize the bequest function by assuming that the marginal utility of bequests is constant. This assumption may be defended in several ways. First, from a practical point of view, without such an assumption the model cannot be solved; the estimation requires a model solution. Second, in other work I found that the strength of the bequest motive did not seem to depend on the wealth level.[4] Third, variations in the level of wealth cause only small variations in the level of the wealth of the heirs; therefore, the marginal utility of wealth of the heirs will roughly be constant over variations in wealth of the older generation, and one would expect the marginal utility of bequests to be constant.

The Pontryagin necessary conditions associated with this problem are that

$$(3) \quad c_t = A_t$$

if $w_t = 0$, and that

---

[4]See my "Savings of the Elderly and Desired Bequests."

$$(4)\quad c_t^{-\gamma} a_t = c_{t+h}^{-\gamma} a_{t+h} e^{h(r-\rho)} + \alpha \int_t^{t+h} e^{(s-t)(r-\rho)} m_s ds$$

over an interval (t,t+h) in which $w_t > 0$. α is the constant marginal utility of bequests.

If $\rho > r$, these conditions generate consumption trajectories that slope downward, and, unless wealth is very large, wealth trajectories that also slope downward. A typical example is shown in figure 1: the consumption path follows equation (4) until bequeathable wealth is exhausted at T; then it follows (3). The present value of the area under the consumption path and above the annuity path equals initial bequeathable wealth. The solution is implicitly defined by:

$$(5.1)\quad c_T = A_T$$

$$(5.2)\quad c_0^{-\gamma} = c_t^{-\gamma} a_t e^{t(r-\rho)} + \alpha \int_0^t e^{(r-\rho)s} m_s ds$$

$$(5.3)\quad w_T = w_0 e^{rT} + \int_0^t (A_s - c_s) e^{(T-s)r} ds$$

$$(5.4)\quad w_T = 0$$

If initial wealth is very large, wealth will never go to zero, and the nature of the solution is different. Although these cases are taken care of in the estimation, I will not discuss them here because empirically they are not important.

Data

The data are from the Longitudinal Retirement History Survey. About 11,000 households whose heads were born in 1906-1911 were

interviewed every two years from 1969 through 1979. Detailed questions were asked about all assets (except a meaningful question on life insurance), and the data were linked with official Social Security records so that one can calculate exactly Social Security benefits. There are some data on consumption, but they are not complete, so I estimate the parameters of the model over wealth data. Bequeathable wealth includes stocks and bonds, property, businesses and savings accounts, all less debts. As suggested by King and Dicks-Mireaux [1982], I exclude housing wealth because the costs of adjusting housing consumption are substantial, so that people may not follow their desired housing consumption path. As long as the consumption of other goods follows its desired path, the parameters may be estimated over bequeathable wealth excluding housing wealth. Annuities include pensions, Social Security benefits, an estimated income value from Medicare/Medicaid, privately purchased annuities (which are very small), welfare transfers, and transfers from relatives. See Hurd and Shoven [1985] for a detailed description of the data.[5]

The estimation method is to use equations (5) to solve for the consumption path as a function of an initial choice of the parameter values. This requires numerical integration and a search for T. The solution will depend on initial wealth. Then, wealth in the next survey, w_2, is predicted from equation (2). That is,

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[5]The estimation is over all singles observed in any two-year period. The real interest rate, r, is taken to be 0.03.

the necessary conditions and the boundary conditions, equations (5), implicitly define

$$w_2 = f(w_0, \{A\}, \theta),$$

in which w_0 is initial wealth, $\{A\}$ is the annuity stream, and θ is the parameter vector $(\gamma\ \rho\ \alpha)'$. The parameter space is searched to minimize a function of $(w_2 - f)$.

Although α is, in principle, identified through nonlinearities in the functional form, the identification is very weak. Therefore, I specify that α is zero if a household has no living children.[6] The interpretation of α is the increase in the marginal utility of bequests across households according to whether they have living children or not. The first set of parameter estimates comes from solving

$$\min_{\theta} \sum (w_2 - f(w_0, \{A\}, \theta))^2$$

The estimated parameter values, which I refer to later as the nonlinear least squares (NLLS) estimates, are

γ	ρ	α
.729	.0501	5.0×10^{-7}
(.004)	(.091)	(1×10^{-4})

Number of observations = 5452

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[6]Although the RHS does not have information about the ages of the children, because of the ages of the RHS population the median age of the children would be about 30 in the first year of the survey. Thus, almost all the children will have their own households.

An analysis of the residuals was consistent with the hypothesis that wealth is observed with error. Therefore, I estimated the parameters by nonlinear two-stage least squares (NL2SLS), in which the parameter estimates come from solving

$$(15)\quad \min_{\theta} [w_2 - f(\theta)]' X (X'X)^{-1} X' [w_2 - f(\theta)]$$

X is an nx15 matrix of observations on income from wealth; these data are not derived from the wealth data but come from separate questions in the RHS. Thus they should not be correlated with the observation errors in w_0.

The results from the NL2SLS are

γ	ρ	α
1.12	-0.011	6.0×10^{-7}
(.074)	(.002)	(32×10^{-7})

Number of observations = 5452

The major difference between the two sets of results is in $r-\rho$, which, if the mortality rate were zero, would control the slope of the consumption trajectory. In the NLLS $r-\rho$ is approximately -0.02; even with a bequest motive, the consumption path will slope downward. In the NL2SLS estimates $r-\rho$ is about 0.04. Even without a bequest motive, the consumption slope will have a positive slope until the conditional mortality rate, m_t/a_t, exceeds 0.04. The NL2SLS consumption trajectories will be much flatter than the NLLS trajectories.

Both sets of estimates produce an estimate of γ that is much smaller that what has typically been assumed in the literature. For example, Kotlikoff, Shoven and Spivak [1983, 1984] use a value of 4 in their simulations. Hubbard [1984] uses values of 0.75, 2 and 4. Davies [1981] "best guess" for his simulations is 4. Large values of γ mean that the slope of the consumption trajectory is not sensitive to variations in mortality rates; my estimates imply that the consumption paths of the elderly will have substantial variation with mortality rates.

The marginal utility of bequests, α, is estimated to be very small, which is consistent with other estimates I have made in a model that is almost free of functional form restrictions.[7] The small estimate of α is caused by the fact that in the data there is no difference between the saving rates of households with children and households without children.

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[7]"Savings of the Elderly and Desired Bequests."

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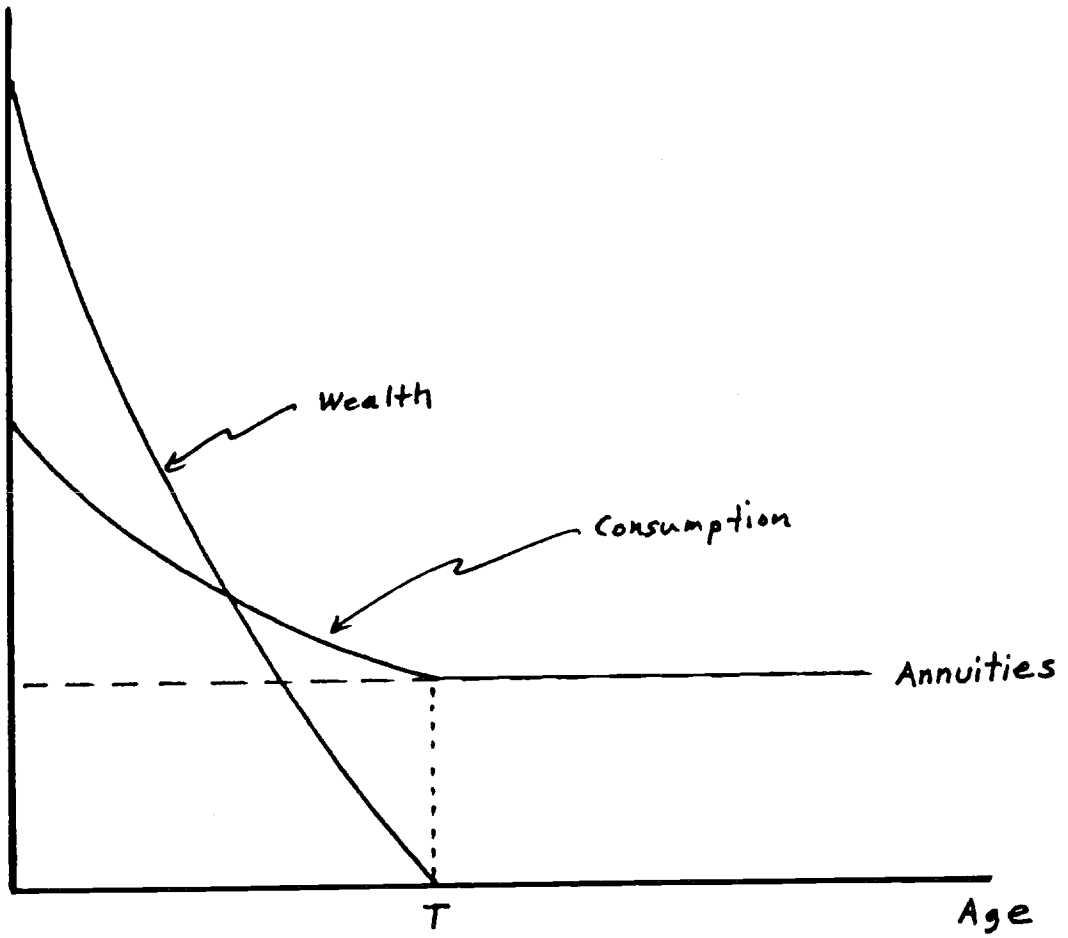
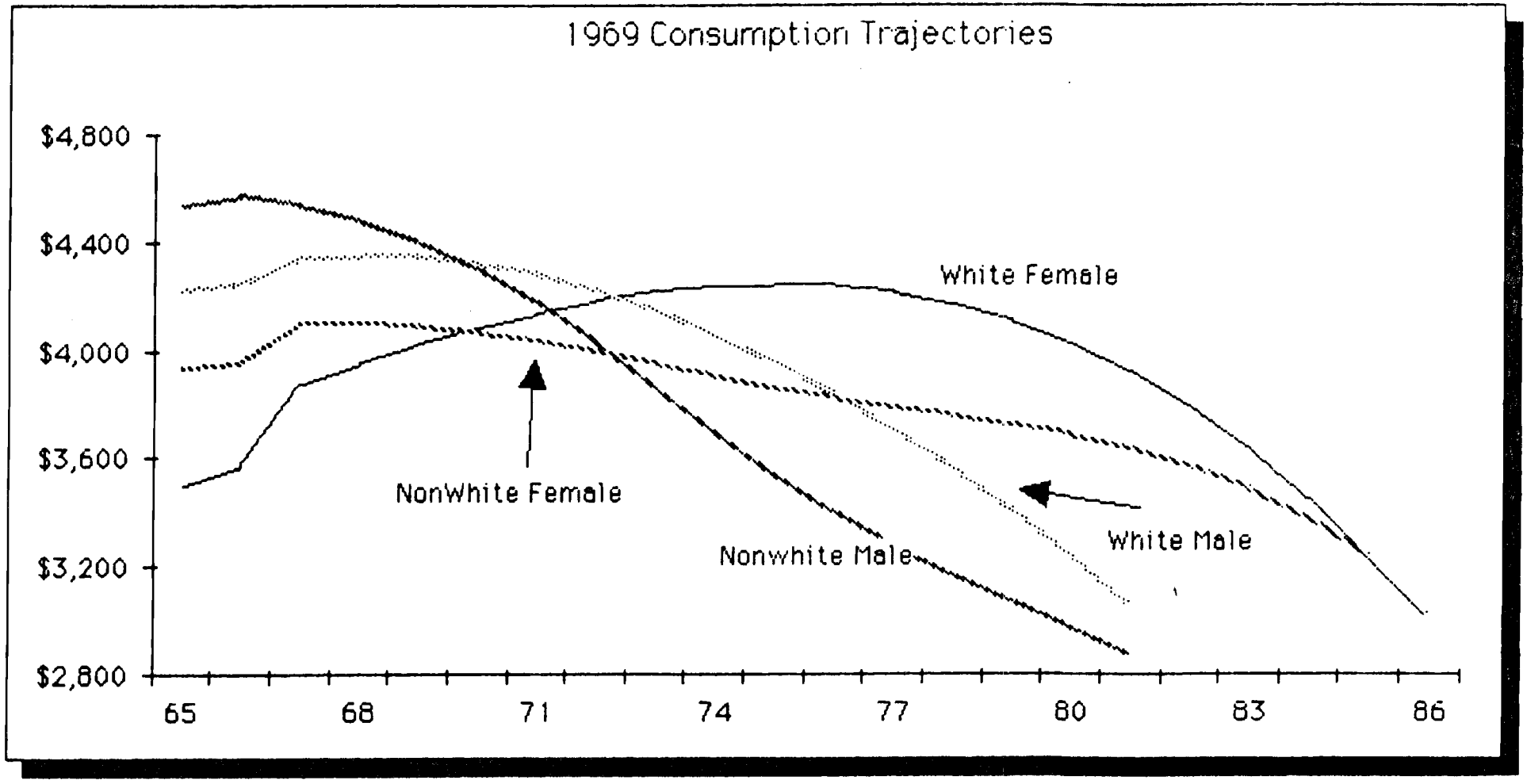


Figure 1

Consumption and Wealth Trajectories

Based on the NLLS parameters

Figure 2


1969 Consumption Trajectories
$4,800
$4,400
$4,000
$3,600
$3,200
$2,800
65
68
71
74
77
80
83
86
White Female
NonWhite Female
White Male
Nonwhite Male

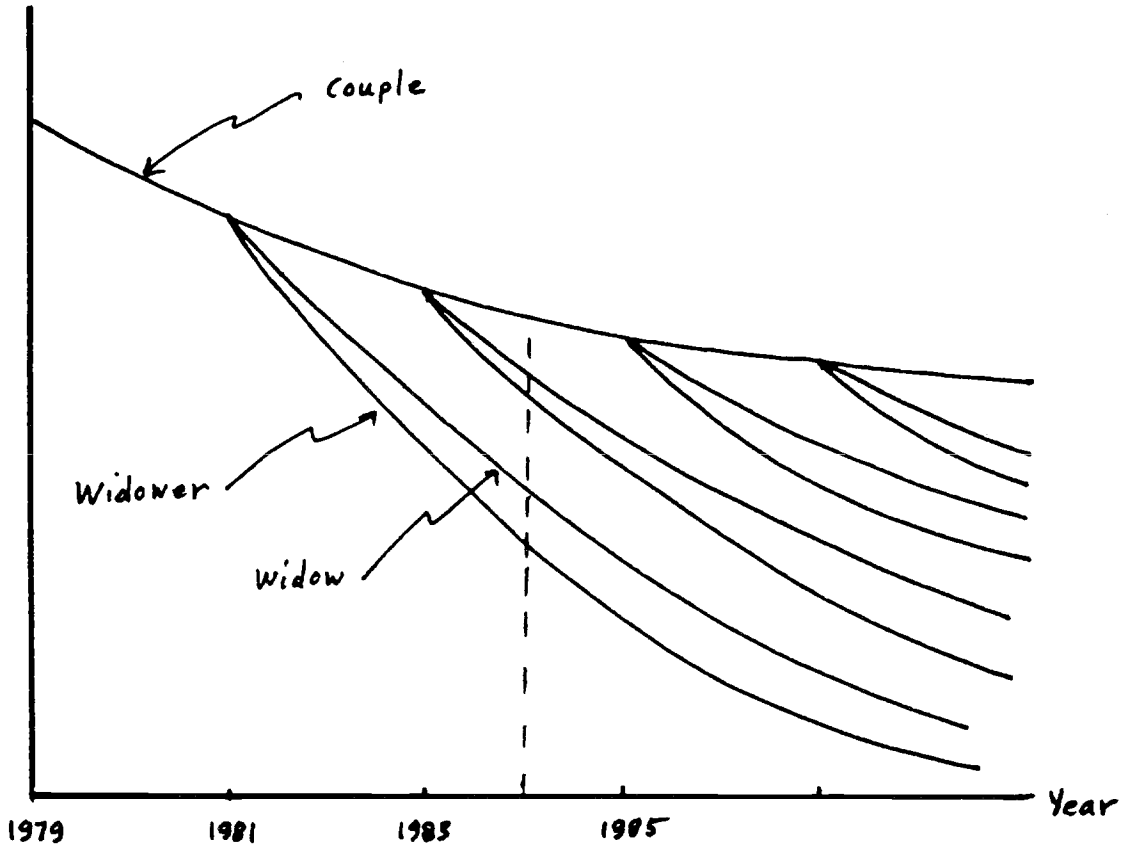


Figure 3

Consumption Trajectories of a Couple and Surviving Widow and Widower

Table 1
Forecasts of the Economic Status of 1979 Widows

A. Based on the NLLS parameter estimates.

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	250	13	499	26	10513	8280	5377	4714	41454	24608
1981	73.0	1830	294	16	524	29	9143	7147	4986	4476	29072	15562
1983	74.0	1721	317	18	539	31	7995	6322	4746	4334	19402	8855
1985	76.0	1595	346	22	540	34	6092	5512	4527	4177	12123	4087
1987	78.0	1453	372	26	519	36	5973	4948	4373	4063	6993	1156
1989	80.0	1299	379	29	476	37	5238	4498	4274	3998	3677	0
1991	82.0	1137	372	33	424	37	4730	4232	4217	3971	1760	0
1993	84.0	968	341	35	366	38	4434	4084	4190	3941	773	0
1995	86.0	798	290	36	303	38	4290	3987	4182	3941	319	0
1997	88.0	630	234	37	239	38	4231	3971	4184	3942	119	0
1999	90.0	475	178	37	179	38	4208	3954	4191	3950	34	0

SUMMARY STATISTICS
(Medicaid/Medicare excluded from wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	398	21	836	43	9683	7297	4547	3827	41454	24608
1981	73.0	1830	465	25	872	48	8313	6275	4156	3594	29072	15562
1983	74.0	1721	504	29	872	51	7166	5386	3917	3457	19402	8855
1985	76.0	1595	555	35	854	54	6074	4532	3699	3309	12123	4087
1987	78.0	1453	604	42	820	56	5146	4017	3546	3216	6993	1156
1989	80.0	1299	618	48	751	58	4413	3614	3449	3154	3677	0
1991	82.0	1137	592	52	675	59	3907	3366	3394	3124	1760	0
1993	84.0	968	543	56	580	60	3614	3193	3369	3097	773	0
1995	86.0	798	465	58	479	60	3473	3144	3364	3096	319	0
1997	88.0	630	373	59	378	60	3418	3122	3371	3102	119	0
1999	90.0	475	283	60	284	60	3402	3121	3384	3108	34	0

Consumption, income and wealth in 1979 dollars.

Table 1 - Continued

B. Based on the NL2SLS parameter estimates.

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	427	22	499	26	6659	5530	5377	4714	41454	24608
1981	73.0	1830	387	21	487	27	6712	5608	5202	4637	36257	21162
1983	74.0	1721	353	21	476	28	6783	5671	5094	4573	30979	17478
1985	76.0	1595	326	20	464	29	6726	5630	4936	4477	25731	14123
1987	78.0	1453	297	20	443	31	6590	5566	4783	4372	20657	10619
1989	80.0	1299	279	21	417	32	6370	5372	4641	4278	15894	7467
1991	82.0	1137	257	23	380	33	6069	5179	4512	4188	11602	4700
1993	84.0	968	241	25	335	35	5709	4923	4405	4112	7958	2377
1995	86.0	798	218	27	284	36	5326	4650	4324	4038	5073	758
1997	88.0	630	188	30	227	36	4964	4424	4270	3988	2984	0
1999	90.0	475	153	32	174	37	4673	4236	4238	3980	1601	0

SUMMARY STATISTICS
(Medicaid/Medicare excluded from wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	662	34	836	43	5828	4539	4547	3827	41454	24608
1981	73.0	1830	604	33	816	45	5882	4614	4371	3723	36257	21162
1983	74.0	1721	562	33	787	46	5954	4704	4264	3672	30979	17478
1985	76.0	1595	521	33	765	48	5898	4680	4107	3590	25731	14123
1987	78.0	1453	485	33	722	50	5763	4647	3956	3501	20657	10619
1989	80.0	1299	456	35	667	51	5545	4470	3815	3414	15894	7467
1991	82.0	1137	425	37	605	53	5246	4245	3689	3342	11602	4700
1993	84.0	968	394	41	531	55	4889	4019	3585	3255	7958	2377
1995	86.0	798	356	45	452	57	4508	3774	3507	3207	5073	758
1997	88.0	630	304	48	363	58	4152	3575	3457	3178	2984	0
1999	90.0	475	244	51	276	58	3866	3419	3431	3156	1601	0

Consumption, income and wealth in 1979 dollars.

Table 2
Forecasts of the Economic Status of 1979 Couples

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age M	Median Age F	Total HH	In Poverty Cons #	In Poverty Cons %	In Poverty Inc #	In Poverty Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	69.0	2418	45	2	60	2	13594	11830	11871	10651	93714	58300
1981	73.0	71.0	2102	43	2	54	3	13331	11624	11667	10457	90469	56227
1983	75.0	72.0	1777	35	2	45	3	13356	11697	11750	10614	87369	54276
1985	77.0	74.0	1452	30	2	38	3	13171	11577	11619	10505	84404	52461
1987	79.0	76.0	1139	24	2	31	3	12989	11452	11489	10368	81545	50586
1989	81.0	78.0	855	19	2	23	3	12810	11310	11363	10292	78741	48824
1991	83.0	80.0	611	13	2	17	3	12630	11156	11234	10175	75916	47061
1993	85.0	82.0	412	9	2	12	3	12452	11011	11107	10065	73137	45286
1995	86.0	84.0	260	6	2	8	3	12274	10881	10979	9983	70417	43629
1997	88.0	86.0	151	4	2	5	3	12104	10732	10856	9885	67841	42004
1999	90.0	87.0	80	2	3	3	3	11940	10584	10737	9806	65388	40488

SUMMARY STATISTICS
(Medicaid/Medicare excluded from wealth and consumption)

Year	Median Age M	Median Age F	Total HH	In Poverty Cons #	In Poverty Cons %	In Poverty Inc #	In Poverty Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	69.0	2418	168	7	215	9	11746	9957	10023	8805	93714	58300
1981	73.0	71.0	2102	149	7	191	9	11484	9732	9820	8625	90469	56227
1983	75.0	72.0	1777	126	7	160	9	11511	9825	9904	8743	87369	54276
1985	77.0	74.0	1452	104	7	132	9	11327	9707	9775	8624	84404	52461
1987	79.0	76.0	1139	82	7	106	9	11147	9568	9648	8529	81545	50586
1989	81.0	78.0	855	61	7	81	9	10972	9431	9524	8447	78741	48824
1991	83.0	80.0	611	45	7	59	10	10795	9301	9399	8334	75916	47061
1993	85.0	82.0	412	31	8	40	10	10620	9166	9275	8242	73137	45286
1995	86.0	84.0	260	20	8	26	10	10447	9024	9152	8139	70417	43629
1997	88.0	86.0	151	12	8	15	10	10283	8901	9035	8046	67841	42004
1999	90.0	87.0	80	6	8	8	10	10127	8782	8924	7961	65388	40488

Consumption, income and wealth in 1979 dollars.

Table 3
Forecasts of the Economic Status of Widows in Steady-State:
Decrease in Bequeathable Wealth at Husband's Death

A. Based on the NLLS parameter estimates.

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

			In Poverty									
	Median	Total	Cons		Inc		Consumption		Income		Wealth	
Year	Age	HH	#	%	#	%	Mean	Median	Mean	Median	Mean	Median
1979	71.0	1922	250	13	499	26	10513	8280	5377	4714	41454	24608
1981	72.0	2047	298	15	534	26	10000	7843	5295	4694	33739	18014
1983	74.0	2148	325	15	561	26	9635	7480	5301	4748	27650	12414
1985	76.0	2214	359	16	576	26	9234	6999	4277	4787	22756	8058
1987	78.0	2230	391	18	570	26	8854	6517	5263	4804	18753	4488
1989	80.0	2186	406	19	539	25	8467	6016	5249	4832	15367	1976
1991	81.0	2078	407	20	496	24	8064	5654	5232	4846	12422	450
1993	83.0	1906	384	20	443	23	7667	5438	5213	4866	9859	0
1995	85.0	1680	339	20	381	23	7281	5289	5195	4883	7639	0
1997	87.0	1414	285	20	313	22	6900	5196	5179	4884	5741	0
1999	89.0	1129	228	20	245	22	6523	5099	5164	4880	4139	0

SUMMARY STATISTICS
(Medicaid/Medicare excluded from wealth and consumption)

			In Poverty									
	Median	Total	Cons		Inc		Consumption		Income		Wealth	
Year	Age	HH	#	%	#	%	Mean	Median	Mean	Median	Mean	Median
1979	71.0	1922	398	21	836	43	9683	7297	4547	3827	41454	24608
1981	72.0	2047	472	23	903	44	9127	6862	4423	3802	33739	18014
1983	74.0	2148	521	24	939	44	8725	6559	4391	3829	27650	12414
1985	76.0	2214	586	26	963	43	8293	5995	4336	3810	22756	8058
1987	78.0	2230	653	29	972	44	7887	5456	4295	3793	18753	4488
1989	80.0	2186	690	32	942	43	7478	5017	4260	3793	15367	1976
1991	81.0	2078	692	33	896	43	7059	4577	4226	3789	12422	450
1993	83.0	1906	670	35	819	43	6648	4327	4194	3777	9859	0
1995	85.0	1680	615	37	721	43	6252	4162	4166	3767	7639	0
1997	87.0	1414	533	38	605	43	5863	4056	4142	3763	5741	0
1999	89.0	1129	439	39	482	43	5481	3972	4122	3758	4139	0

Consumption, income and wealth in 1979 dollars.

Table 3 - Continued

B. Based on the NL2SLS parameter estimates.

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	427	22	499	26	6659	5530	5377	4714	41454	24608
1981	72.0	2047	394	19	497	24	7128	5886	5488	4877	40160	23403
1983	74.0	2148	365	17	497	23	7607	6355	5614	4996	38098	21768
1985	76.0	2214	342	15	496	22	7963	6621	5656	5135	35385	19544
1987	78.0	2230	317	14	486	22	8229	6858	5664	5190	32119	17304
1989	80.0	2186	302	14	469	21	8383	6999	5639	5184	28380	14174
1991	81.0	2078	283	14	441	21	8401	6983	5588	5153	24296	10910
1993	83.0	1906	269	14	400	21	8284	6807	5520	5127	20091	7625
1995	85.0	1680	249	15	349	21	8037	6525	5445	5088	15992	4576
1997	87.0	1414	220	16	291	21	7678	6131	5373	5044	12203	2264
1999	89.0	1129	185	16	232	21	7239	5781	5306	4997	8859	662

SUMMARY STATISTICS
(Medicaid/Medicare excluded from wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	662	34	836	43	5828	4539	4547	3827	41454	24608
1981	72.0	2047	623	30	847	41	6255	4926	4615	3933	40160	23403
1983	74.0	2148	596	28	851	40	6697	5342	4705	4052	38098	21768
1985	76.0	2214	567	26	860	39	7022	5594	4715	4111	35385	19544
1987	78.0	2230	540	24	848	38	7262	5887	4696	4132	32119	17304
1989	80.0	2186	519	24	822	38	7394	5983	4651	4126	28380	14174
1991	81.0	2078	494	24	784	38	7396	5940	4582	4099	24296	10910
1993	83.0	1906	470	25	725	38	7265	5750	4501	4039	20091	7625
1995	85.0	1680	440	26	650	39	7008	5451	4416	3983	15992	4576
1997	87.0	1414	395	28	556	39	6641	5049	4336	3915	12203	2264
1999	89.0	1129	339	30	452	40	6197	4649	4264	3863	8859	662

Consumption, income and wealth in 1979 dollars.

Table 4
Forecasts of the Economic Status of Widows in Steady-State:
No Change in Bequeathable Wealth at the Husband's Death

A. Based on the NLLS parameter estimates.

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	250	13	499	26	10513	8280	5377	4714	41454	24608
1981	72.0	2047	297	15	534	26	10178	7865	5339	4699	35179	18247
1983	74.0	2148	325	15	560	26	9948	7515	5371	4755	29979	12751
1985	76.0	2214	358	16	575	26	9650	7067	5361	4825	25556	8393
1987	78.0	2230	390	17	567	25	9336	6547	5351	4825	21699	4708
1989	80.0	2186	404	18	536	25	8978	6089	5334	4856	18214	2154
1991	81.0	2078	405	19	494	24	8579	5704	5309	4878	14995	543
1993	83.0	1906	382	20	441	23	8158	5496	5279	4897	12056	0
1995	85.0	1680	337	20	380	23	7719	5341	5248	4899	9423	0
1997	87.0	1414	284	20	312	22	7270	5231	5220	4897	7125	0
1999	89.0	1129	227	20	244	22	6823	5131	5195	4896	5160	0

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	398	21	836	43	9683	7297	4547	3827	41454	24608
1981	72.0	2047	472	23	901	44	9305	6875	4466	3803	35179	18247
1983	74.0	2148	520	24	935	44	9039	6587	4461	3835	29979	12751
1985	76.0	2214	584	26	957	43	8709	6052	4420	3821	25556	8393
1987	78.0	2230	650	29	965	43	8368	5525	4384	3814	21699	4708
1989	80.0	2186	685	31	933	43	7989	5098	4346	3821	18214	2154
1991	81.0	2078	685	33	887	43	7574	4655	4303	3813	14995	543
1993	83.0	1906	663	35	811	43	7139	4370	4260	3802	12056	0
1995	85.0	1680	608	36	714	43	6690	4205	4219	3789	9423	0
1997	87.0	1414	527	37	601	42	6233	4098	4183	3772	7125	0
1999	89.0	1129	434	38	480	42	5781	4001	4153	3766	5160	0

Consumption, income and wealth in 1979 dollars.

Table 4 - Continued

B. Based on the NL2SLS parameter estimates.

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	427	22	499	26	6659	5530	5377	4714	41454	24608
1981	72.0	2047	393	19	496	24	7219	5901	5531	4880	41601	23674
1983	74.0	2148	364	17	496	23	7781	6383	5689	5004	40580	22157
1985	76.0	2214	341	15	494	22	8211	6681	5752	5151	38566	20045
1987	78.0	2230	316	14	484	22	8543	6944	5771	5213	35700	17837
1989	80.0	2186	301	14	467	21	8748	7092	5751	5213	32095	14917
1991	81.0	2078	281	14	437	21	8806	7068	5697	5206	27925	11539
1993	83.0	1906	268	14	398	21	8711	6914	5621	5168	23459	8104
1995	85.0	1680	247	15	347	21	8470	6623	5535	5123	18975	5072
1997	87.0	1414	218	15	289	20	8097	6258	5448	5070	14724	2627
1999	89.0	1129	183	16	231	20	7625	5875	5366	5026	10877	848

SUMMARY STATISTICS
(Medicaid/Medicare included in wealth and consumption)

Year	Median Age	Total HH	In Poverty Cons #	Cons %	Inc #	Inc %	Consumption Mean	Consumption Median	Income Mean	Income Median	Wealth Mean	Wealth Median
1979	71.0	1922	662	34	836	43	5828	4539	4547	3827	41454	24608
1981	72.0	2047	622	30	845	41	6347	4938	4658	3938	41601	23674
1983	74.0	2148	592	28	847	39	6871	5369	4779	4067	40580	22157
1985	76.0	2214	563	25	856	39	7270	5654	4811	4132	38566	20045
1987	78.0	2230	536	24	842	38	7576	5960	4804	4169	35700	17837
1989	80.0	2186	515	24	814	37	7759	6056	4762	4159	32095	14917
1991	81.0	2078	490	24	774	37	7800	6042	4691	4128	27925	11539
1993	83.0	1906	464	24	717	38	7692	5858	4602	4082	23459	8104
1995	85.0	1680	433	26	642	38	7440	5544	4506	4013	18975	5072
1997	87.0	1414	388	27	549	39	7060	5153	4411	3953	14724	2627
1999	89.0	1129	334	30	446	40	6583	4736	4324	3888	10877	848

Consumption, income and wealth in 1979 dollars.

Table 5
Distribution of Consumption

Consumption	Medicare/Medicaid Included	Medicare/Medicaid Excluded
less than 1	63.5	72.6
1-2	47.9	106.8
2-5	544.4	666.0
5-10	748.0	665.8
10-20	571.9	486.4
20-50	155.8	134.5
50-100	15.5	15.0
more than 100	1.4	1.3
total households	2148.4	2148.4

Consumption categories are in thousands of 1979 dollars

Table 6
Forecasts for Couples: Base Case

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.1	91.5	16	60890	11638	3	10519	4	9845	9	8725	10
1983	90.4	87.9	79	65388	11989	3	10787	3	10176	8	8974	10
1987	86.6	84.2	260	70416	12332	2	11038	3	10505	8	9211	10
1991	82.8	80.4	611	75915	12699	2	11303	3	10863	7	9467	10
1995	78.9	76.6	1139	81545	13069	2	11570	3	11228	7	9728	9
1999	75.0	72.7	1777	87368	13454	2	11847	3	11608	7	10002	9
2003	71.1	68.8	2418	93714	13877	2	12154	2	12029	7	10306	9
TOTAL	75.9	73.6	6299	86600	13404	2	11812	3	11561	7	9969	9

Table 7
Forecasts for Singles: Base Case

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.3	92.5	762	2245	5959	21	5059	22	5071	40	4170	42
1983	90.6	88.9	1501	4655	6731	21	5140	22	5829	38	4239	42
1987	86.8	85.3	2335	8000	7523	20	5227	23	6611	36	4315	42
1991	83.0	81.6	3001	12178	8258	19	5318	23	7340	33	4400	42
1995	79.1	77.9	3348	13797	8993	17	5411	24	8068	29	4486	42
1999	75.1	74.2	3376	25321	9931	14	5552	23	9000	24	4621	42
2003	71.2	70.5	3179	39589	11399	11	5859	22	10462	20	4922	40
TOTAL	79.5	79.2	17501	18367	8963	16	5441	23	8041	29	4519	41

Consumption, income and wealth in 1979 dollars.

Table 8
Dynamic Forecasts for Couples: Growth in Bequeathable Wealth

Base Year	Mean Age M	Mean Age F	Total #HH	Wealth	Mean ($1979) MC Included Cons	%	Inc	%	MC Excluded Cons	%	Inc	%
1979	94.1	91.5	16	60980	11638	3	10519	4	9845	9	8725	10
1983	90.4	87.9	79	70575	12240	2	10942	3	10427	8	9129	10
1987	86.6	84.2	260	82072	12896	2	11387	3	11069	7	9560	9
1991	82.8	80.4	611	95580	13650	2	11893	2	11815	7	10057	8
1995	78.9	76.6	1139	110930	14491	2	12451	2	12650	6	10610	8
1999	75.0	72.7	1777	128443	15441	2	13079	2	13596	6	11234	7
2003	71.1	68.8	2418	148904	16548	1	13810	2	14700	5	11961	7
TOTAL	75.9	73.6	6299	127138	15366	2	13028	2	13523	6	11184	7

Table 9
Dynamic Forecasts for Singles: Growth in Bequeathable Wealth

Base Year	Mean Age M	Mean Age F	Total #HH	Wealth	Mean ($1979) MC Included Cons	%	Inc	%	MC Excluded Cons	%	Inc	%
1979	94.3	92.5	762	2245	5959	21	5059	22	5071	40	4170	42
1983	90.6	88.9	1501	5116	6877	20	5154	22	5976	38	4252	42
1987	86.8	85.3	2335	9655	7973	19	5276	22	7061	35	4365	41
1991	83.0	81.6	3001	16130	9156	18	5437	23	8238	32	4518	41
1995	79.1	77.9	3348	25459	10489	15	5645	23	9565	27	4720	40
1999	75.1	74.2	3376	39161	12130	12	5967	22	11200	21	5036	39
2003	71.2	70.5	3179	63118	14996	10	6565	20	13559	17	5628	35
TOTAL	79.5	79.2	17501	28480	10553	15	5722	22	9541	27	4800	39

Consumption, income and wealth in 1979 dollars.

Table 10
Dynamic Forecasts for Couples: Growth in Social Security

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.1	91.5	16	60890	11638	3	10519	4	9845	9	8725	10
1983	90.4	87.9	79	65388	12688	2	11485	3	10725	7	9523	9
1987	86.6	84.2	260	70416	13794	2	12499	2	11653	5	10359	7
1991	82.8	80.4	611	75915	14990	1	13594	1	12662	4	11266	5
1995	78.9	76.6	1139	81545	16260	1	14760	1	13732	3	12232	4
1999	75.0	72.7	1777	87368	17616	1	16010	1	14874	3	13267	3
2003	71.1	68.8	2418	93714	19091	1	17368	1	16119	2	14395	3
TOTAL	75.7	73.4	6299	87982	17448	1	15856	1	14734	3	13141	4

Table 11
Dynamic Forecasts for Singles: Growth in Social Security

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.3	92.5	762	2245	5959	21	5059	22	5071	40	4170	42
1983	90.6	88.9	1501	4579	7128	17	5543	18	6152	32	4567	35
1987	86.8	85.3	2335	7749	8347	13	6055	15	7279	28	4987	31
1991	83.0	81.6	3001	11614	9526	11	6590	13	8362	24	5425	28
1995	79.1	77.9	3348	16339	10739	8	7132	11	9469	19	5863	25
1999	75.1	74.2	3376	23957	12316	6	7727	9	10933	14	6344	22
2003	71.2	70.5	3179	39589	14875	5	8527	9	13277	9	7020	18
TOTAL	79.5	79.2	17501	18454	10750	10	7037	12	9485	20	5789	26

Consumption, income and wealth in 1979 dollars.

Table 12
Dynamic Forecasts for Couples: Growth in Pensions

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.1	91.5	16	60890	11612	3	10492	4	9818	9	8698	11
1983	90.4	87.9	79	65388	11979	3	10776	3	10166	8	8963	10
1987	86.6	84.2	260	70417	12353	2	11058	3	10526	8	9231	10
1991	82.8	80.4	611	75916	12764	2	11368	3	10929	7	9533	9
1995	78.9	76.6	1139	81545	13199	2	11700	3	11358	7	9858	9
1999	75.0	72.7	1777	87369	13673	2	12066	2	11827	7	10221	9
2003	71.1	68.8	2418	93714	14218	2	12495	2	12370	7	10647	8
TOTAL	75.9	73.6	6299	86600	13628	2	12035	2	11784	7	10192	9

Table 13
Dynamic Forecasts for Singles: Growth in Pensions

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.3	92.5	762	2236	6023	21	5125	22	5134	38	4236	40
1983	90.6	88.9	1501	4623	6818	20	5233	22	5917	37	4331	40
1987	86.8	85.3	2335	7938	7630	20	5337	22	6718	35	4426	40
1991	83.0	81.6	3001	12094	8393	19	5449	23	7474	33	4530	41
1995	79.1	77.9	3348	17317	9153	16	5557	23	8228	29	4632	41
1999	75.1	74.2	3376	25267	10097	14	5700	23	9166	24	4769	41
2003	71.2	70.5	3179	39589	11548	11	5986	22	10611	20	5049	40
TOTAL	79.5	79.2	17501	19005	9100	16	5568	23	8178	29	4646	40

Consumption, income and wealth in 1979 dollars.

Table 14
Dynamic Forecasts for Couples: Mortality Changes

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.3	91.8	48	60486	11639	3	10527	3	9831	9	8719	11
1983	90.5	88.1	169	65047	11990	3	10793	3	10166	8	8970	10
1987	86.7	84.4	424	69998	12319	2	11032	3	10486	8	9198	10
1991	82.8	80.6	820	75279	12665	2	11281	3	10825	8	9441	10
1995	78.9	76.7	1320	80985	13037	2	11547	3	11193	7	9704	9
1999	75.0	72.8	1876	87114	13439	2	11837	3	11592	7	9990	9
2003	71.1	68.8	2418	93714	13877	2	12154	2	12029	7	10306	9
TOTAL	76.5	74.2	7073	85124	13310	2	11745	3	11466	7	9901	9

Table 15
Dynamic Forecasts for Singles: Mortality Changes

Base Year	Mean Age M	Mean Age F	Total #HH	Mean ($1979) Wealth	MC Included Cons	%	MC Included Inc	%	MC Excluded Cons	%	MC Excluded Inc	%
1979	94.5	92.8	1280	3190	6191	21	5057	23	5294	40	4160	43
1983	90.7	89.2	2092	5724	6848	21	5131	23	5941	38	4224	42
1987	86.9	85.5	2819	8801	7400	20	5197	24	6486	36	4283	43
1991	83.0	81.8	3274	12473	7890	19	5267	24	6970	34	4347	43
1995	79.1	78.0	3437	17513	8530	17	5363	24	7604	30	4437	43
1999	75.1	74.3	3374	25524	9461	15	5529	24	8530	25	4598	42
2003	71.2	70.5	3179	39589	10890	12	5859	22	9953	21	4922	40
TOTAL	80.2	80.3	19454	18189	8471	17	5388	23	7549	31	4466	42

Consumption, income and wealth in 1979 dollars.