NBER WORKING PAPER SERIES

THE INCREASING ANNUITIZATION OF THE ELDERLY - ESTIMATES AND IMPLICATIONS FOR INTERGENERATIONAL TRANSFERS, INEQUALITY, AND NATIONAL SAVING

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Working Paper No. 4182

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
October 1992

We are grateful to Jagadeesh Gokhale and Jinyong Cai for helpful comments, and to the National Institute on Aging for support. This paper is part of NBER's research program in Aging. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

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ABSTRACT

This paper examines changes over time in the degree to which the resources (human plus nonhuman wealth) of the elderly have been annuitized. Using data from the 1962 and 1983 Federal Reserve Surveys of Consumer Finances we find evidence of an increase in annuitization which is particularly pronounced among the older elderly (those over 75) and among women. The estimated 1983 flow of aggregate bequests to children and grandchildren would have been 20% larger were it not for this increase in annuitization. The change in annuitization may have contributed significantly to the recent decline of the U.S. national saving rate.

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I. Introduction

This paper examines the form in which elderly Americans hold their wealth. We distinguish between two forms of wealth-holding. Non-annuitized wealth is wealth in the conventional sense: ownership of assets which can be sold, transferred, or, in the event of an individual's death, bequeathed. Annuitized wealth, by contrast, is the claim to a stream of future payments that will not continue beyond a person's death. The stream of future Social Security or pension payments that a person will receive is an example of annuitized wealth.

The annuitization of the resources of the elderly can have major implications for a country's bequests, saving, and resource distribution. In the extreme case in which bequests arise solely because annuities are unavailable, the provision of annuities can lead the elderly to consume all the resources they would otherwise have bequeathed to younger generations. Although the young would respond to the elimination of their expected bequests by reducing their consumption, the net change in the economy's consumption would be positive because of differences in propensities to consume of the young and old. Hence, the availability of annuities will decrease national saving absent an intrinsic desire to bequeath. Simulation exercises (e.g., Kotlikoff and Spivak, 1981; Davies, 1981; Abel, 1985; and Kotlikoff et. al., 1986) suggest that the availability of annuities could increase the consumption of the elderly by over a third and produce an even larger percentage reduction in the long run stock of wealth.

The distribution of resources could also be greatly affected by a reduction in bequests resulting from increased annuitization of the elderly. In the U.S. the one percent of households with the most net wealth own 34.3 percent of total net wealth. The distribution of bequests is similarly

skewed. If all bequests were eliminated, one would expect the distribution of net wealth to more closely resemble the distribution of human wealth, which is much more equally distributed than is nonhuman wealth. Only 11.0 percent of labor income is received by the one percent of households with the largest amount of labor income.

Have the resources of U.S. elderly become more annuitized? Certain stylized facts suggest that they have, while others suggest that they have not. Social security benefits currently represent almost 10 percent of U.S. personal income compared with only 4 percent in 1960. The increase in private pensions in the last three decades has also been dramatic. In 1962 nine percent of elderly Americans received income from private pensions. By 1988 the figure had risen to 29 percent.[1] In 1960 pension funds represented only 5.2 percent of U.S. household net wealth; by 1990 they represented 16.5 percent. The combined effect of increases in social security and pensions raised the fraction of the income of the elderly represented by these annuitized sources from 40 percent in 1967 to 55 percent in 1988.[2]

While the share of household resources tied up in annuitized social security and pension benefits has increased over time, for older Americans the annuitized share of resources represented by future streams of survival-contingent earnings has declined. This is due to the continuing trend toward earlier retirement. Between 1963 and 1983, for example, the labor force participation rate for men aged 60-64 fell from 80% to 57%, while the rate for men aged 65-69 fell from 41% to 26%. The fraction of elderly Americans' income represented by earnings fell from 30 percent in

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[1] Chen (1992), table 15.3.
[2]Chen (1990), table 15.11.

1967 to 17 percent in 1988.[3] Earlier retirement may have partially or fully offset the increased annuitization of the resources of older Americans associated with social security and pensions.

A second way in which older Americans could have maintained their net degree of annuitization in the face of increases in Social Security and private pensions is by purchasing additional life insurance. As Yarri (1963) showed, purchasing life insurance is equivalent to selling off one's annuities. While such a possibility exists, Auerbach and Kotlikoff (1987) find no evidence that households use life insurance to offset government-induced changes in their degree of annuitization. Specifically, they report that survivor insurance provided by Social Security does not lead to offsetting reductions in the private purchase of life insurance. The Auerbach-Kotlikoff study considers the demand for life insurance to protect surviving spouses. In contrast, Bernheim (1991) treats married couples as single agents who purchase life insurance solely as a means of providing bequests for children. He reports that households do increase their life insurance purchase in response to the government's provision of social security annuities, but the life insurance offset appears to be quite modest. Taken together, the Auerbach-Kotlikoff and Bernheim findings suggest very considerable scope for increased annuitization to raise the consumption of the elderly and to lower their bequests.[4]

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[3] ibid.

[4] A final reason why the elderly's annuitization may not have increased involves the possible role of children in providing their older parents with annuity insurance. Kotlikoff and Spivak (1981) showed that the family can substitute quite well for a complete annuities market. If families do indeed provide this form of insurance, their response to the increased provision of annuities by social security and private pensions would be to reduce their own provision. While family risk sharing may characterize some families, a recent study by Altonji, Hayashi, and Kotlikoff (1992) tests for and strongly rejects family risk sharing behavior as a ubiquitous phenomenon.

Despite the importance of the issue, there appears to be no previous systematic study of changes over time in the annuitized and bequeathable share of resources of America's elderly. Several recent studies (Radner and Vaughn, 1987; Greenwood, 1987; Avery and Kennickell, 1990) have examined the distribution at a point in time of U.S. net wealth. Other studies by Feldstein (1976), Avery, Elliehausen, and Gustafson (1986), Wolff (1987a), and McDermed, Clark, and Allen (1989) have examined the distribution of broader concepts of wealth, including some annuitized components of wealth. These studies indicate the importance of annuitized wealth in the total resources of the elderly.

This paper examines changes over time in the annuitization of America's elderly. It does so with data from the 1962 and 1983 Federal Reserve Surveys of Consumer Finances. These surveys provide information on the net worth and current incomes of American households. Both over-sampled high income American households. High income households are particularly important for understanding the annuitization of resources because they own the bulk of nonannuitized net wealth.

The paper considers individuals age 50 and older. For each such individual we calculate three resource components: human wealth (the present value of future wages), social security plus pension wealth (the present value of future payments to and receipts from these programs), and net worth (assets less debts). We use these resource components to consider the fraction of total resources which are survival-contingent (i.e., are annuitized or effectively annuitized).

We find a fairly dramatic post-1962 increase in the annuitization of the resources of America's elderly. This growth is particularly striking among the oldest age groups and among women. Our estimate of the growth in the annuitized share of resources is biased downward because of several data-construction decisions and because we cannot take into account

the very sizable health-care annuity represented by Medicare. Medicare did not come into existence until 1965, and real benefit levels during the early years of Medicare were substantially smaller than was the case by 1983. So including Medicare annuities as part of total resources would imply a bigger increase in the degree of annuitization. In the 1980s Medicare benefit payments totaled roughly 40 percent of social security benefit payments.

We find no evidence that life insurance has been used to offset the increased annuitization of America's elderly. Indeed, the amount of insurance protection, as represented by the ratio of the term value (face value less cash value) of insurance to total resources, declined by more than half for those aged 65 and above between 1962 and 1983. Thus, the increased annuitization appears to have reduced the flow of aggregate bequests (including life insurance) from what would otherwise be the case. We estimate that the flow of bequests to children and grandchildren would have been at least 20% larger in 1983 were it not for the increase in annuitization between 1962 and 1983.

Since the increased annuitization is least pronounced among the richest older Americans, the increased annuitization has increased inequality in the distribution of bequests. Finally, America's elderly may have significantly increased their rate of consumption in response to their increased annuitization, and this may be an important factor in the recent collapse of the U.S. national saving rate.

The rest of the paper is organized as follows. Section II presents a very simple model showing how annuitization can affect aggregate wealth accumulation. Section III describes the data, our data imputations, and our sample selection. Section IV presents our constructed resource data and uses these data to consider changes between the two surveys in the degree of annuitization. Section V begins by considering the extent to which

households have maintained the ratio of contingent bequests to total resources through the purchase of additional life insurance. A respondent's contingent bequest is defined as the bequest he or she would leave if he or she were to die immediately subsequent to the survey. We use our estimates of contingent bequests to estimate the size of the total flow of U.S. bequests in 1983, and how this flow would have differed if people in 1983 had held bequeathable wealth in the same proportion to total resources as they held in 1962. Section VI turns to the issue of resource inequality and points out that the inequality in total resources is considerably smaller than the inequality in net wealth. This section also suggests how the increased annuitization of the elderly's resources may affect the distribution of net worth through time. Section VII summarizes findings and draws conclusions.

II. A Simple Model of the Effect of Annuitization on Wealth Accumulation

To see the potential impact on aggregate wealth accumulation of the provision of annuities, consider the steady state of a two-period life cycle model in which agents' utility depends only their consumption when young and old, C_y and C_o, respectively. There is no population growth, and the size of each cohort is normalized to unity. Agents work only when young, earning a wage W. They survive with probability (1-p) to their old age. We assume that there is no private annuities market, but that the government subtracts an amount T from the wages of the young, which it returns with interest to the surviving members of each cohort in their old

age.[5] Since there are (1-p) survivors in each cohort, the annuity paid to each survivor is T(1+r)/(1-p), where r is the real interest rate.

If T does not exhaust private saving, those who die prior to their last period of life will leave bequests. We'll assume that total bequests at each point in time are divided equally among the young. Since a fraction p of the members of each cohort will die prior to old age, the bequest received per young person will be pB, where B is the bequest made per decedent.

At the beginning of any period of time (before anyone has died), total wealth in the economy, K, equals the sum of private wealth of the elderly plus the wealth held by the government. The wealth held by the government is just T -- the contribution of each contributor to the government's pension scheme times the number of contributors, which is unity. Private wealth of the elderly can be traced to their saving when young, W + pB -T - C_y. Total wealth is thus is T plus W+pB-T-C_y, hence we have

$$K=W+pB-C_y. \tag{1}$$

The bequest B, of those leaving bequests, is given by

$$B=(W+pB-T-C_y)(1+r). \tag{2}$$

For those agents who live to the end of their second period, their consumption, C_o, is given by

where the first term on the right hand side of (3) represents principal plus

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[5] An employer, rather than the government, could provide the pension by contributing an amount T of the wages of each worker. The total amount contributed by each group of workers plus accrued interest would be paid to the surviving members of the group in their old age.

$$C_o=(W+pB-T-C_y)(1+r)+\frac{T(1+r)}{(1-p)}, \tag{3}$$

interest on private savings, and the second term is the government's annuity payment to survivors. We close the model by assuming that agents maximize an expected time-separable, homothetic utility function over consumption when young and old, given by

$$U=u(C_y)+(1-p)\alpha u(C_o), \tag{4}$$

where α is the time preference parameter. Maximization of utility subject to the budget constraint given in (3) implies that consumption when old is proportional to consumption when young, i.e.,

$$C_o=\theta C_y \tag{5}$$

where the factor of proportionality, Θ, depends on α, r, and p.[6]

The above equations imply

$$K=\frac{W-pT(1+r)\left[1+\frac{1}{\theta(1-p)}\right]}{1-\frac{1+r}{\theta}-p(1+r)}. \tag{6}$$

According to equation (6), aggregate wealth is a decreasing function of T, the amount of saving which is annuitized by the government. The intuition for this result is clear from equations (1)-(3) and (5). According to (1) and

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[6] In this model we are assuming that one cannot purchase annuities at the margin from private insurance companies. Allowing for such purchases would change the value of Θ.

(2), raising T lowers the steady state level of bequests as well as the steady state capital stock ignoring induced changes in consumption when young. If consumption when young were to fall as much as inheritances received when young (pB), aggregate wealth would remain unchanged. But, according to equations (3) and (5), consumption when young falls by less than pB for two reasons. First, the propensity to consume when young is less than unity. Second, the annuity provided by the government increases the amount each generation can afford to consume over its lifetime, because it reduces undesired bequests.

Note that, in this model, the reason why government provided annuities -- social security -- reduce aggregate wealth is quite different from the reason given by Martin Feldstein (1974). Feldstein pointed out that social security, if provided on an unfunded "pay-as-you-go" basis, entails direct intergenerational redistribution by the government which will lower wealth accumulation absent intergenerational altruism. Feldstein's argument goes through in settings in which there is no life-span uncertainty. In contrast to Feldstein's model, in the above model there is no direct government intergenerational redistribution. Social security is fully funded. But the form in which social security is provided, namely as an annuity, triggers a reduction in accidental bequests, which are private transfers from the old to the young. In our model, if there is no uncertainty about the date of death, social security will have no effect on saving.

In our model agents have no interest in leaving bequests and, therefore, have no interest in purchasing life insurance. As Yaari (1965) first demonstrated, the purchase of term life insurance is equivalent to selling an annuity and vice-versa. If we modified our model to include a bequest motive and the voluntary purchase of life insurance, we would find that government annuitization of the saving of each generation of young would simply lead the young to purchase more life insurance; i.e., the

annuities purchased by the government would be immediately resold.

III. Data, Imputations, and Sample Selection

The Data

The data used in this paper come from two sources: The 1962 Survey of Financial Characteristics of Consumers (1962 SFCC), conducted in 1963, and The 1983 Survey of Consumer Finances (1983 SCF), conducted in 1983. The 1962 SFCC sample size is 2557 households. A total of 429 of these households have heads age 65 and over. The 1983 SCF contains data on 3,824 households, of which 724 have heads age 65 and over. The interviews for both surveys were conducted in person.

Income totals in the 1962 and 1983 surveys refer to income in calendar 1962 and 1982, respectively. Asset totals in the 1962 survey refer to assets as of December 31, 1962. Asset totals in the 1983 survey refer to assets at the time of the survey. The strength of these surveys lies in their coverage of asset-holding, but neither provides the kind of detailed breakdown of certain types of income that one would like. For example, in 1963 households were asked only about their combined 1962 social security and private pension income, not about each component separately. In addition to not distinguishing the source of pension income, the 1962 survey provides only the household total for this income, rather than the separate amounts received by the husband and wife. The 1983 survey reports the household's total social security plus private pension income and separately reports the household's private pension income. But if one aggregates private pension income, as reported in the 1983 SCF, one arrives at considerably more private pension income than the national aggregate reported in Kotlikoff and Smith (1983). Hence, for 1983, as for 1962, we

rely on the variable indicating the total receipt of social security plus private pension income. This is but one example of our use of parallel methodologies to construct resource components for 1962 and 1983.

Benchmarking

In order to deal with the problem of possible under- or over-reporting of assets and income in the Surveys of Consumer Finance, we compare the totals in the survey to aggregate totals, and adjust (benchmark) the survey data so that the two match. Our survey totals are computed using the surveys' household weights.

In the case of net worth, we compare aggregate household net worth in the surveys to the corresponding annual totals in the Federal Reserve Balance Sheets. For 1962 the Federal Reserve's value for household net worth is $1.896 trillion. For 1983, it is $11.089 trillion. The respective 1962 SFCC and 1983 SCF aggregates are $1.463 trillion and $10.540 trillion. We thus adjust reported net worth upward by 29.6 percent in 1962 and by 5.2 percent in 1983.

Labor earnings forms the basis for our calculation of both the human wealth and social security wealth of those in our sample who are working at the times of the surveys. Hence, benchmarking labor earnings is our means of benchmarking these two components of total resources. To benchmark labor earnings we compare aggregate wage and salary income of the non-self-employed in the two surveys to the total compensation of employees in 1962 and 1982 reported by the U.S. Department of Commerce. The benchmark totals are $299.3 billion in 1962 and $1,586.1 billion in 1982. The respective 1962 SFCC and 1983 SCF totals are $277.6 billion and $1,468.5 trillion. Based on these figures we adjust upward reported wages and salaries by 7.8 percent for 1962 and by 8.0 percent for 1983.

For respondents who report receiving social security plus private pension income we use their reported receipts of this income to form estimates of their social security plus private pension wealth. For both 1962 and 1982 we compare total pension and social security income for all households in the SFCC to the sum of aggregate Social Security payments plus aggregate private pension payments. Aggregate Social Security payments is determined as the sum of 1962 or 1982 OASI and DI aggregate payments reported in The 1983 Social Security Bulletin Annual Statistical Supplement. The aggregate of 1962 private pension benefits is calculated as the weighted average of total private pension payments for 1960 and 1965 (adjusted to 1962 dollars by the CPI) reported in Kotlikoff and Smith (1983, Table 3.7.9). Our 1982 benchmark for aggregate pension income is total 1980 pension benefit payments, as reported in Kotlikoff and Smith, adjusted for the growth from 1980 to 1982 in the CPI and in the number of elderly.

The benchmark and survey values for aggregate social security and pension income are remarkably close. For 1962 the benchmark value is $17.2 billion, while the SFCC value is $17.3. For 1982 the benchmark value is $194.7 billion, while the SCF value is $191.4 billion. We thus adjust the reported total of social security plus pension income downward by .6 percent for 1962 and upward by 1.8 percent for 1982.

Calculation of Social Security plus Private Pension Wealth for Social Security and Private Pension Recipients

For current social security and private pension income recipients we calculate social security and pension wealth for the two periods in exactly the same manner. First, in the case of married couples, we allocate two-thirds of our benchmarked value of social security plus pension income to the husband and one third to the wife. This is the split that would be in

effect if all of this income represented Social Security retirement benefits and if the wife collected Social Security dependent benefits.

The resulting individual values of social security plus pension income are then used to determine the net present value of benefits for each respondent in our sample. Specifically, we calculate the actuarial discounted value of future social security plus private pension income taking into account Social Security survivorship benefits. Our actuarial discounting assumes a 3 percent real interest rate and uses sex-specific life tables from 1960 and 1980. In 1982 Social Security survivorship rules provided surviving spouses with the maximum of their own benefit or that of their deceased spouse. In 1962 the survivor benefit equaled the maximum of one's own benefit or 82.5 percent of one's deceased spouse's benefit.

One bias in this variable arises from our assumption that the private pension income component of total social security plus private pension income is subject to the same survivorship provision as is the social security component. This assumption leads to an upward bias in the calculated value of 1962 social security plus pension wealth because survivor benefits in private pension plans have become more generous over time. In addition, in 1983 a greater fraction of recipients of private pensions chose joint survivor pensions than was the case in 1962.[7]

A second upward bias in our calculated value for 1962 of social security plus private pension wealth arises from our treating social security and pension income in 1962 as if it were fully indexed for inflation. Unlike the situation in 1982, in 1962 there was no such formal indexation of social

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[7] Beller and McCarthy (1992) report that for married men retiring and receiving a defined benefit pension before 1974, 24.8% of pension plans provided protection for a surviving spouse. By the period 1979-82, the comparable figure was 59.5%.

security benefits. In addition, very few, if any, firms had legal commitments to index their pension benefits in 1962. While this income was not formally indexed, post-1962 adjustments to the benefit levels of social security and private pensions amounted to partial indexation. In assuming full indexation we overstate the 1962 value of social security plus private pension wealth relative to the 1982 value. Correcting for these two biases would strengthen the finding reported below that the elderly's resource annuitization increased between 1962 and 1982.

Calculation of Social Security Wealth for Households Still Working

For non-retired men and women we calculated separate values for social security and private pension wealth. Our social security wealth calculation requires a wage history which we base on the respondents' reported current wage. We project the current wage forward until retirement and backward until the beginning of working life. In the 1962 data, we assumed an annual growth rate in the real wage of 2 percent. In the 1983 data, we assumed an annual growth rate of average real wages of 1 percent. In addition, in 1983 we applied to each worker the cross-sectional growth in wages for their three digit industries and age group. These cross-sectional growth rates are those calculated by Avery, et. al. (1988) based on data from the Bureau of the Census current population survey.

The first step in the calculation of Social Security benefits is the calculation of the average value of wages entering the Social Security Primary Insurance Amount (PIA) benefit formula. Before 1977 the calculation of the PIA was based on Average Monthly Wages (AMW). After 1977 the PIA was based on Averaged Indexed Monthly Earnings (AIME): past wages were inflated by the ratio of average wages in the economy in the year the individual reaches age 60 to average wages in the

year in which income was earned. Thus in 1983, past wages were adjusted for both inflation and real wage growth.

We replicated these rules in our calculations. In 1962, we assumed a 3.5 percent annual growth rate of nominal wages (2 percent real growth plus 1.5 percent inflation). For 1983 the rate of growth of prices and, thus nominal wages, does not affect the calculation of expected real benefits. Given the calculated values of AMW and AIME, we determined each working respondent's prospective PIA at his or her age of retirement using the rules in force in 1962, in the case of the 1962 survey, and 1983 in the case of the 1983 survey.

Calculation of Private Pension Wealth for those Still Working

The 1983 SCF contains a calculated value for private pension wealth which we adopt as our measure of private pension wealth for working respondents in 1983. Since the 1962 SFCC contains no comparable calculation of private pension wealth, we imputed 1962 private pension wealth for current workers based on a regression of 1983 pension wealth on the incomes and characteristics of 1983 SCF respondents. The 1983 data is converted into 1962 dollars before the regression is run. These regression coefficients are then applied to the 1962 data. We adjust for the increase in the prevalence of pension coverage by multiplying imputed pension wealth in 1962 by the ratio of the fraction of the labor force covered by pensions in 1962 to the fraction covered in 1979 (the last year for which we have data). Kotlikoff and Smith (1983) report that the fraction of workers covered by private, federal, or state and local pension plans (not including Social Security) rose from 39.7 percent in 1962 to 48.2 percent in 1979.

Calculation of Human Wealth for those Still Working

We used the future real wage profiles calculated above to determine what our working respondents would earn in future years were they to

continue working. To predict retirement ages for working respondents we used the cross sectional sex- and age-specific labor force participation rates for 1962 and 1983[8]: if the participation rate for men aged 65 was x and the rate for men aged 70 was y, then we assign a man who was working at age 65 a probability of y/x of working when he was 70. We also use the period-specific mortality probabilities (by age and sex) to discount human wealth

Tricky Cases and Sample Selection

There are a number of respondents in both surveys for whom it is difficult to calculate some or all resource components. Self-employed respondents are one example. Since we are not sure how much of their income reflects labor as opposed to capital income, we have little basis for assessing their human wealth and their social security wealth. Rather than make heroic assumptions to deal with the self-employed, we simply exclude them from our analysis.

A second group consists of respondents over 62 who both receive social security and/or private pension benefits, but who also report positive labor earnings. For such respondents we assume they will cease working immediately and apply the 1962 or 1982 social security earnings test to calculate the size of the full social security benefit they would receive if they earned zero labor income. We use this calculated benefit to form the social security wealth for these respondents. In those cases that the calculated benefit exceeds the maximum social security benefit for the year

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[8] The data we started with were participation rates for five-year age groups up through age 74, and the rate for people 75+. We smoothed these with a polynomial and assumed that the participation rate for people 80 and above was zero.

in question, we simply attribute the maximum social security benefit to these respondents.

A third group are respondents age 62 and under who report receiving both social security and private pension income as well as labor income. We use the following ad-hoc rule, which we derived from looking at the data: for people with earnings in excess of four times their reported social security and private pension income, we use only the wage information and ignore the social security and private pension benefit. For respondents with wages less than four times the benefit, we use the benefit and ignore the wage. Our reason for using this rule is that there are many people with very small benefits and moderate-sized wages, so using their benefits make little sense. Similarly, there are people with very small wages and moderate-sized benefits. The factor of four was chosen because it neatly divides the two groups and because someone with a ratio of 4 at age 60 would have approximately equal social security wealth calculating using either wages or benefits.

A fourth group of potentially problematic respondents are those over 65 who indicate that they neither receive wages nor any social security and private pension income. For such respondents we ascribe zero human wealth and zero social security plus private pension wealth.

Finally, there are respondents age 65 and under who neither report the receipt of current social security and private pension benefits nor current income. Unfortunately, the 1962 SCF does not allow for people under 65 and not working to be counted as retired. Thus everyone in the category is either self employed (52.5 percent), a farm operator (18.0 percent), or simply described as not working (27.5 percent) (we presume that these people are unemployed). Since we can not trust reported wages in any of these cases, we exclude all of these respondents.

In addition to the sample selections described above, for most of

our analysis we limit our sample to all males and females over age 50. For some parts of our analysis we also consider all households whose heads are age 50 or more.

IV. Changes in the Composition of Resources and the Increased Annuitization of the Elderly

In addition to calculating human wealth and social security plus private pension wealth for each respondent in our sample, we also calculate each respondent's net worth (assets less debt). In the case of married respondents we ascribe half of the couple's net worth to the husband and half to the wife. Table 1 reports weighted average values of total resources (which is the sum of human wealth, net worth, and social security plus private pension wealth) along with its components for both years of the sample and for men and women separately. All values are expressed in 1983 dollars. The table indicates that total lifetime resources are lower for older cohorts. For example, for males age 50 to 54 in 1983 the average value of resources is $603,823 whereas for males age 70-74 in 1983 the average value is less than half as large -- $224,309. The difference between the wealth of people at different ages in a single cross section is, of course, due to both cohort and age effects. The largest component of this change is the decline in annuitized resources among older people. This is predominantly an age effect: a person who receives a Social Security benefit (or a wage) that is constant in real terms will still experience declining annuitized resources as he ages because the net present value of future payments will be falling. The cross-sectional profile of net worth, which peaks in the age range 65-69 (except for women in 1962, for whom it peaks at 70-74) is much more difficult to interpret. To the extent that it represents an age effect, it can be interpreted as shedding light on the

degree to which the elderly dissave, and on the applicability of the life cycle model of saving (see Hurd, 1990). For the rest of this paper, we do not try to interpret the results from a single cross-section. Instead we focus on the change between our two surveys in the status of people in a fixed age group.

Table 2 shows how the fraction of total resources held in annuitized form changed between 1962 and 1983. The results are presented for men and women combined as well as for each sex separately. We calculate both the average ratio of annuitized to total resources for all of the individuals in a group (the average ratio) and the ratio of average annuitized resources to average total resources (the ratio of averages). The ratio of the averages is less than the average ratio because, as we'll discuss below, those with greater total resources have smaller shares of their resources annuitized and the degree of annuitization of such individuals is more heavily weighted in the ratio of the averages than in the average ratio.

Examining either the average ratio or the ratio of the averages, one sees a similar patter. The degree of annuitization tends to be fairly similar in the two time periods for the younger half of the sample, but among those over 65, and especially for those over 75, there is a large increase in the degree of annuitization in 1983. For men and women over 65 combined, the average ratio of annuitized to total wealth increased by 20% of its initial value (from .50 to .60), while the ratio of average annuitized resources to average total resources increased by 33% (from .30 to .39). Among men and women over 75, the ratio of averages increased by more than 50% of its initial value.

This pattern is consistent with the two sources of change in the degree of annuitization that we mentioned above: the increase in social security and pensions on the one hand, and the decline in the retirement age on the other. For people under age 65 these two changes worked to offset each

other. For people beyond working age, however, we only see the effect of the former change: a rise in the degree of annuitization.

Table 3 presents annuitization ratios analogous to those in Table 2, for married and single households. The pattern that the gap between the 1962 and 1983 annuitization rates rises with age is maintained in this table. The gap between the 1962 and 1983 annuitization rates is highest for single women, and it appears at an earlier age (60-64) in this group than elsewhere. This large increase in the degree to which the wealth of single women is annuitized presumably reflects changes in the survivorship provisions of Social Security and private pension plans.

V. Implications of the Elderly's Increased Annuitization for Bequests and National Saving

The increased annuitization of the elderly means that a smaller fraction of resources will be bequeathed. As discussed above, elderly people who wanted to maintain the fraction of their resources that were bequeathed in the face of an exogenous increase in annuitized resources could have offset their annuities by purchasing life insurance.

Table 4 examines changes in holdings of life insurance between 1962 and 1983. The table shows that the ratios of the face value (the amount paid in the event of death) and the term value (the face value less the cash value of whole life policies) of life insurance to total resources in 1962 and 1983. We separately examine married couples and single individuals. The table shows that for both groups there has been a dramatic decline in the extent of insurance coverage: for married couples with husbands aged over 65, the value of insurance as a fraction of resources fell by one half, while for singles over 65, the extent of insurance fell by more than two thirds. In the case of married couples, this change is potentially explained by the

increased generosity in the survivorship provisions of Social Security and private pensions. In the case of single individuals (who among the older age groups are mostly widows and widowers), the decrease in the degree of insurance coverage seems clear evidence of a decline in the desire to bequeath resources to the next generation. Hence, changes in life insurance holdings not only failed to offset the increased annuitization of the elderly, but actually reinforced the reduction in the bequests/resources ratio associated with increased annuitization.

To examine the magnitude of the potential impact on bequests we estimate the annual flow of bequests in 1983 by multiplying respondents' bequeathable assets (their net worth plus the term value of life insurance policies on their lives) by their age- and sex-specific mortality probabilities.[9] We do not count inter-spousal bequests in our bequest total. Rather, we follow Kotlikoff and Summers (1981) in assuming that 10 percent of bequeathable assets of married men and 19 percent of the bequeathable assets of married women are bequeathed to people (primarily children and grandchildren) outside the household.

Applying this technique to the 1983 data gives an annual bequest flow of $57.8 billion. In order to examine how the change in the fraction of assets held in annuitized form has affected the bequest flow, we re-estimated the 1983 bequest flow adjusting bequeathable assets in 1983 to reflect the 1962 pattern of annuitization. Specifically, we blew up bequeathable wealth for each individual in 1983 by the age- and sex-specific ratio of bequeathable wealth to total resources in 1962 divided by the same fraction in 1983. This technique yielded a bequest flow of $68.9 billion in

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[9] Kotlikoff and Summers (1981) use this technique to estimate expected bequests in the 1962 SFCC. Sheiner and Weil (1992) discuss the bias that arises in using such a technique if individuals alter their behavior in the period preceding death.

1983, 19.2 percent larger than the estimated value of actual 1983 bequests.

As a check on the robustness of this finding, we repeated the above calculation of bequests in 1983, this time excluding human wealth from the calculations. Human wealth is probably the least accurately measured of our variables, since we have no precise information on the ultimate retirement age of those still working in our sample. We calculated bequeathable wealth as a fraction of resources in both years, excluding the present value of future wages from the resource total. We then used the ratio of the bequest/resource ratio in 1962 to the bequest/resource ratio in 1983 to blow up 1983 bequeathable resources. This exercise yielded a bequest flow of $71.5 billion in 1983, 23.7 percent larger than the estimated value of actual 1983 bequests.

These exercises suggest that, given the 1983 total resources of the elderly, 1983 bequests would have been at least $10 billion larger in the absence of the increased annuitization. In decreasing bequests the increased annuitization presumably financed a rise in personal consumption expenditure of equal magnitude. The $10 billion sum is nontrivial when compared with the 1983 total for net national saving (NNP less personal consumption and government purchases) of $106.2 billion.

VI. The Impact of Increased Annuitization on Inequality in the Distribution of Bequests

We now turn to an examination of the effect of changes in the degree of annuitization on the distribution of bequests. If changes in the degree of annuitization are different for groups that hold different amounts of wealth, then changes in annuitization will change the distribution of bequests. To the extent that bequests received from past generations are a major determinant of the wealth-holding of those currently alive (Kotlikoff and

Summers, 1981), changes in the distribution of bequests will induce changes in the distribution of wealth.

Table 5 shows the shares of total resources and net worth held by different ranges of the total resources and net worth distributions, for both 1962 and 1983. We confine our analysis to individuals aged 65 and over. As one would expect, the distribution of net worth is more skewed than the distribution of total resources. For example, among men the top decile of the resource distribution held 51% of total resources in 1962 and 53% in 1983, while the top decile of the net worth distribution had 65% of net worth in 1962 and 66% in 1983. Since net worth and resources are correlated, this implies (and the next table shows) that people with low resources also have high fractions of their resources held in annuitized form.

Table 6 shows for both years the degree of annuitization for men and women over 64 in different ranges of the total resource distribution. It shows that the fraction of resources held in annuitized form declines markedly as one moves up the resource distribution. Thus differences in annuitization act to make the distribution of bequests more skewed than the distribution of resources: the richer a person is, the higher the fraction of his or her wealth bequeathed.

For all but one of the groups examined, the degree of annuitization rose between 1962 and 1983. The rise in annuitization is especially pronounced among women. The annuitization rate among women is particularly significant for intergenerational wealth transmission because women are most commonly the last surviving member of a household. Women in the 50th through 89th percentiles of the resource distribution increased their rate of annuitization by approximately 50% of its initial value, while for women in the top decile, the rate of annuitization more than doubled. On the other hand, the rate of annuitization for women in the top 5% of the

resource distribution rose very little as a fraction of total resources (from 4.4% of resources to 9.4% of resources) when compared with other parts of the resource distribution: for example women in the rest of the top half of the resource distribution saw their rate of annuitization rise by at least 15% of total resources. Thus it seems that changes in annuitization acted to increase the inequality of the distribution of bequests.

To further examine how changes in the form in which resources are held have affected the size and distribution of the bequest flow, we projected expected bequests by the elderly in 1983 (in the manner of section V above) by different parts of the distribution of total resources. We then inflated bequeathable wealth of individuals so that the bequest/resource ratio in each resource class would match the bequest/resource ratio for that class in 1962, and re-estimated the flow of bequests in 1983. The results of this exercise are presented in Table 7. The table shows that if the elderly had held bequeathable resources in the same proportion to total resources in 1983 as they had in 1962, the flow of bequests from the elderly would have been 20% higher in 1983.[10] The table also shows how changes in the fraction of resources that are bequeathable have changed the distribution of bequests. Among men, the fraction of bequests coming from men in top five percent of the resource distibution is the same using either the 1962 or the 1983 pattern of resource holding. Among women, by contrast, the change in resource holding has made the distribution of bequests more unequal: using 1962 patterns of asset holding, women in the top five percent of the resource distibution would have accounted for 33.0% of total bequests; using the 1983 pattern of asset holding, they accounted for

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[10] The gross size of the bequest flow in this table is slightly smaller than that presented in section V because here we are considering only those 65 and above.

40.2% of the total flow.

VII. Summary and Conclusion

This paper documents a significant increase in the annuitization of the resources of America's elderly over the period 1962-1983. The increase in annuitization is most dramatic for the older elderly. The increased annuitization reflects the growth of social security and private pensions, and is somewhat offset by a decline in labor force participation. Our estimate of the growth of the annuitization share is biased downward for several reasons, the most important of which is that the very sizable annuity provided in 1982 by Medicare is not included in the analysis.

A larger annuitized share of resources implies that a smaller fraction of resources will be bequeathed absent increases in the purchase of life insurance. Such offsetting increases in life insurance purchase did not, however, occur over the period. On the contrary, both the face and term values of life insurance were substantially smaller relative to the elderly's resources in 1983 than they were in 1962. According to our estimates, the 1983 flow of bequests would have been approximately 20% larger had the elderly had the same total resources, but the 1962 degree of annuitization. Given the conservative nature of the assumptions we made in calculating the change in the degree of annuitization, we guess that bequests in 1983 would have been as much as 30% higher if the degree of annuitization had remained at its 1962 level.

The estimated reduction in bequests in 1983 ($11.1 billion by one estimate, $13.7 billion by another) amounts to a substantial sum when compared to the $106.2 billion of total net national saving in 1983. The implied reduction in national saving in 1983 was not a one time event. Rather the increased annuitization means an ongoing reduction in national

saving and the national investment that saving finances. While increased annuitization can not explain all of the remarkable recent decline in U.S. saving, it appears to be an important piece of the puzzle.

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Table 1

Total Resources and Resource Components

(Average Values in 1983 Dollars)

Men in 1962 in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
R	473864	376138	248666	212326	164410	113319	105461	291712	163623
NW	81302	108990	74826	116032	114737	81175	88990	95486	105429
AW	392563	267148	173840	96294	49674	32143	16471	196226	58195
SSPPW	46401	45761	48364	44053	35641	25626	16471	41823	34111
HW	346162	221387	125476	52241	14032	6518	0	154404	24084

Men in 1983 in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
R	603823	505990	388401	335964	224309	176353	153331	383877	252267
NW	125208	148038	148590	192947	131678	113993	115979	145999	151806
AW	478615	357952	239811	143017	92631	62359	37351	237877	100461
SSPPW	108532	108159	100121	89310	65725	56812	37351	89254	69937
HW	370084	249793	139691	53707	26906	5548	0	148624	30524

Women in 1962 in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
R	224107	191452	146270	133894	130777	103658	77268	155692	119399
NW	97342	100278	83491	96695	100146	84469	63567	91916	90700
AW	126765	91174	62779	37199	30631	19189	13701	63776	28699
SSPPW	46812	42620	37835	30942	27763	19132	13701	34847	25418
HW	79953	48554	24945	6257	2868	57	0	28929	3281

Women in 1983 in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
R	334115	297508	246597	289035	180926	150011	119485	251692	204077
NW	112508	118242	127721	190890	102983	89814	72266	122978	126825
AW	221607	179266	118876	98145	77943	60196	47220	128715	77253
SSPPW	121728	107984	90424	91637	75375	59966	47220	91635	74128
HW	99878	71282	28452	6509	2569	230	0	37079	3125

R - Total Resources
NW - New Worth
AW -Total Annuitized Wealth (Human Capital plus Social Security and Private Pension Wealth)
SSPPW - Social Security and Private Pension Wealth
HW - Human Wealth

Table 2

The Annuitized Share of Total Resources

Men and Women in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 AR	0.787	0.702	0.658	0.549	0.506	0.461	0.382	0.625	0.497
1983 AR	0.793	0.738	0.681	0.614	0.610	0.569	0.575	0.673	0.599
1962 RA	0.754	0.634	0.577	0.371	0.272	0.230	0.166	0.575	0.301
1983 RA	0.740	0.662	0.559	0.385	0.422	0.380	0.316	0.571	0.388

Men in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 AR	0.873	0.774	0.758	0.619	0.538	0.488	0.350	0.699	0.532
1983 AR	0.863	0.762	0.727	0.633	0.610	0.590	0.525	0.700	0.604
1962 RA	0.828	0.710	0.699	0.454	0.302	0.284	0.156	0.673	0.356
1983 RA	0.793	0.707	0.617	0.426	0.413	0.354	0.244	0.620	0.398

Women in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 AR	0.684	0.625	0.587	0.499	0.472	0.441	0.409	0.559	0.468
1983 AR	0.736	0.719	0.644	0.595	0.610	0.553	0.617	0.651	0.594
1962 RA	0.566	0.476	0.429	0.278	0.234	0.185	0.177	0.410	0.240
1983 RA	0.663	0.603	0.482	0.340	0.431	0.401	0.395	0.511	0.379

AR - Average Ratio of Annuitized Resources to Total Resources
RA - Ratio of the Average Value of Annuitized Resources to the Average Value of Total Resources

Table 3

The Annuitized Share of Total Resources by Marital Status

Married Couples, by Age of Husband

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 AR	0.848	0.749	0.722	0.611	0.526	0.475	0.378	0.688	0.534
1983 AR	0.842	0.738	0.694	0.620	0.621	0.583	0.525	0.685	0.603
1962 RA	0.755	0.625	0.614	0.411	0.289	0.271	0.162	0.598	0.335
1983 RA	0.740	0.643	0.555	0.382	0.408	0.362	0.280	0.558	0.380

Single Men in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 AR	0.829	0.639	0.765	0.474	0.603	0.576	0.302	0.629	0.517
1983 AR	0.841	0.724	0.803	0.707	0.566	0.603	0.550	0.700	0.596
1962 RA	0.814	0.606	0.673	0.329	0.275	0.288	0.158	0.531	0.273
1983 RA	0.751	0.661	0.689	0.581	0.321	0.252	0.224	0.598	0.350

Single Women in Age Group

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 AR	0.839	0.771	0.603	0.476	0.491	0.492	0.439	0.569	0.477
1983 AR	0.770	0.833	0.739	0.671	0.628	0.590	0.660	0.691	0.637
1962 RA	0.833	0.679	0.500	0.250	0.321	0.174	0.215	0.451	0.243
1983 RA	0.782	0.772	0.697	0.543	0.474	0.448	0.510	0.621	0.495

AR - Average Ratio of Annuitized Resources to Total Resources
RA - Ratio of the Average Value of Annuitized Resources to the Average Value of Total Resources

Table 4

Ratios of Face and Term Values of Life Insurance to Total Resources

Married Couples, by age of Husband

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 F/R	0.079	0.099	0.095	0.077	0.066	0.047	0.032	0.084	0.066
1983 F/R	0.074	0.079	0.068	0.031	0.045	0.021	0.022	0.060	0.032
1962 T/R	0.070	0.088	0.079	0.060	0.045	0.031	0.014	0.071	0.048
1983 T/R	0.069	0.071	0.057	0.023	0.034	0.014	0.016	0.052	0.024

Single Men and Women

	50-54	55-59	60-64	65-69	70-74	75-79	80+	50+	65+
1962 F/R	0.073	0.096	0.048	0.068	0.022	0.035	0.064	0.063	0.050
1983 F/R	0.061	0.085	0.036	0.016	0.014	0.011	0.013	0.041	0.014
1962 T/R	0.061	0.086	0.043	0.062	0.014	0.032	0.051	0.054	0.043
1983 T/R	0.058	0.082	0.029	0.011	0.009	0.008	0.009	0.037	0.009

F/R - Ratio of face value of life insurance to resources
T/R - Ratio of term value of life insurance to resources

Table 5

The Distributions of Total Resources and Net Worth of the Elderly, 1962 and 1982

(Share of Resources or Net Worth)

Men

	Resources		Net Worth	
	1962	1983	1962	1983
First Quartile	0.041	0.045	0.008	0.010
Second Quartile	0.093	0.094	0.051	0.045
Third Quartile	0.161	0.153	0.126	0.111
75th-89th Percentile	0.198	0.175	0.163	0.172
90th-94th Percentile	0.108	0.114	0.156	0.111
94th-99th Percentile	0.399	0.419	0.496	0.552

Women

	Resources		Net Worth	
	1962	1983	1962	1983
First Quartile	0.052	0.056	0.011	0.009
Second Quartile	0.098	0.112	0.058	0.054
Third Quartile	0.170	0.184	0.142	0.127
75th-89th Percentile	0.192	0.188	0.176	0.172
90th-94th Percentile	0.101	0.106	0.135	0.126
94th-99th Percentile	0.388	0.354	0.478	0.512

Table 6

The Elderly's Annuitized Shares of Resources by their Position in the Resource Distribution

	Men		Women	
Position in the Resource Distribution	1962	1983	1962	1983
First Quartile	0.705	0.778	0.712	0.755
Second Quartile	0.519	0.657	0.515	0.659
Third Quartile	0.483	0.543	0.381	0.556
75th-89th Percentile	0.460	0.440	0.289	0.453
90th-94th Percentile	0.341	0.389	0.156	0.391
94th-99th Percentile	0.183	0.232	0.044	0.094

Table 7

Projected Bequests by the Elderly in 1983

Using 1962 and 1983 Ratios of Bequests/Resources

(Billions of Dollars)

	Men		Women	
Bequest/Resource ratio:	1962	1983	1962	1983
Position in the Resource Distribution				
First Quartile	0.6	0.4	1.1	0.8
Second Quartile	1.3	0.9	2.8	1.8
Third Quartile	5.6	4.6	6.1	4.3
75th-89th Percentile	3.5	3.5	5.5	4.1
90th-94th Percentile	4.8	4.3	3.6	2.4
94th-99th Percentile	11.4	10.4	9.4	9.0
Total	27.1	24.2	28.5	22.4

Note: This second and fourth columns of this table present projections of the flow of bequests in 1983 using the methodology described in section V of this paper. The first and third columns inflate bequeathable wealth for individuals in each resource class in 1983 such that the mean ratio of bequeathable wealth to total wealth is the same as that for the corresponding resource class in 1962. All of the calculations are performed only for men and women aged 65 and over.