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9 Trends in Social Security Wealth by Cohort

Robert Moffitt

This paper has a simple and straightforward purpose: to calculate the present value of Social Security payroll taxes and benefits received for a series of cohorts who have reached retirement age since the system began in 1937. Such a calculation is of interest for at least two reasons. First, despite the great ink spillage on Social Security in the 1970s, one will search in vain for a simple historical calculation of the type presented here. While a number of calculations have been made of the internal rates of return to Social Security taxes and of related present values (e.g., Aaron 1977; Brittain 1972; Burkhauser and Warlick 1979; Feldstein and Pellechio 1977; Freiden, Leimer, and Hoffman 1976; Pechman, Aaron, and Taussig 1968; and others), none have systematically examined trends in Social Security wealth for the entire period since 1937, nor have any presented a systematic analysis of the causes of the trends in Social Security wealth. This is not to say, however, that there is not already widely perceived conventional wisdom on what the postwar trends have been. This conventional wisdom (as several fellow economists at the University of Maryland and the Brookings Institution have confirmed) is that (a) cohorts retiring to date have received more in present-value terms than they have paid in; (b) that the magnitude of the net present value of benefits minus taxes, representing the across-cohort or intergenerational transfer provided by the system, was greatest for the earliest cohorts and has steadily fallen over time (at least in some relative sense); and (c) that (a) and (b) are simple reflections of a pay-as-you-go system, for in such a system the benefits of each group of retirees are

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financed by the taxes of the contemporaneous group of workers, implying that the first few retiring cohorts will have paid in very little and therefore will do very well relative to their contributions. The calculations in this paper confirm these prior concepts in their broad outlines, but the exact senses in which they are true are clarified considerably. In addition, in at least one particular (whether the transfer has increased or decreased over time) the calculations show that in a sense the conventional wisdom is quite misleading, if not incorrect.

A second motivation for this exercise—which provided the stimulus for my original interest in these calculations—relates to the behavioral question of whether the Social Security system has historically had any effects on savings and hence the capital stock (Feldstein 1974) or on labor supply or retirement (Burkhauser and Turner 1978). Most of the time-series studies of these questions (see Danziger, Haveman, and Plotnick 1981 for a review) have relied on a calculation of the total value of Social Security wealth, which is very unlike that calculated here. The wealth series calculated by Feldstein (1974) and Munnell (1974), and updated more recently by Leimer and Lesnoy (1980)—I shall call it the FMLL series—calculates for each group of individuals of a certain age the present value of future benefits minus only the present value of future taxes to be paid; past taxes are not included. The exclusion of past taxes is suggested by analogy with the Ando-Modigliani-Brumberg model of life-cycle consumption, in which consumption is assumed to be a function of the present value of two variables: that of the future income stream, plus that of assets as of the current time, rather than as of the beginning of the life cycle. In a fully funded Social Security system, one in which past taxes are accumulated in a reserve fund for future retirees, the economy-wide value of contemporaneous assets would include the value of this reserve fund and hence the present value of past taxes. But in a pay-as-you-go system, one in which taxes are quickly paid out as benefits, no reserve fund is present and hence the model in no way represents past taxes. This would seem to call for some modification of the Ando-Modigliani-Brumberg model for an examination of Social Security, for it is rather difficult to see how the life-cycle effects of Social Security can be estimated when the value of past taxes paid in is assumed to have no effect on behavior. This paper in no way directly addresses this modeling issue, but clearly an alternative approach to examining the time-series evidence on Social Security would be to start with a more strictly cohort-defined Social Security wealth variable of the type developed here.[1]

9.1 Preliminaries

The Social Security Act of 1935 established the basis for the Old Age, Survivors, and Disability Insurance program in the United States. However, the 1935 Act merely provided the basis for the present program; it has changed enormously since then. For example, the 1935 Act provided only for retirement benefits—benefits for survivors of covered workers and for dependents were enacted at later dates. Also, under the initial Act benefits were much lower than now, payroll tax rates were considerably less, and coverage of the working population was below what it is today. In a series of amendments to the Act since 1935, benefits have been increased and liberalized, tax rates have been raised, and coverage has been broadened.

Nevertheless, the structure of the program for present purposes has always been roughly the same. Covered workers are required to pay a legislated percent of their earnings up to a legislated amount, termed the taxable maximum earnings level. Employers are required to pay an equal percentage of their employees' earnings up to the same maximum. At the age of 65, or somewhat earlier since early retirement has been permitted, individuals who have accumulated sufficient quarters of coverage are entitled to benefits of various types. Four types of benefits represent the bulk of the system's expenditures. One represents payments to retired men who are entitled to benefits under their earnings records; another is the equivalent payment to women entitled under their earnings records; a third is the payment to wives who choose to take the amount to which they are entitled under their husbands' earnings records; and the fourth is the payment to aged widows who are entitled to survivor benefits under their late spouses' earnings records. In all cases the single most important characteristic of the system is that benefits are not directly based on taxes paid in. Rather, they are based on a weighted average of lifetime earnings, the weights being determined by a fairly complicated formula which has changed over time. Hence the relationship between contributions and benefits is indirect and often very loose.

The conceptual basis for the calculations of the net present value of benefits minus taxes is simple. Taxes began to be paid in 1937; benefits began to be paid in 1940. For each birth cohort that has reached retirement age since 1940, the calculation desired requires a stream of tax payments and benefit payments at each age in that cohort's lifetime. Summed and discounted, the requisite net present value is obtained. However, the available published data are not in perfect form for this calculation. Benefits of various types are generally available by age and sex in each year, as are the number of benefit recipients of each type. In the upper age ranges the data are often grouped into broad age intervals, requiring some interpolation to obtain amounts for smaller age intervals. Unfortunately, tax payments by age and sex are not available. Consequently, data on annual earnings by age and sex are used in conjunction with the relevant payroll tax rate to estimate tax payments.[2] Since payments are made only up to a certain maximum, and since only median earnings are available, some assumption regarding the distribution of earnings must be made to determine how many individuals are and are not at the maximum.

For the purposes of this paper, life-cycle streams of taxes and benefits are calculated for eight cohorts spaced at five-year intervals. The tax and benefit payments are in turn grouped into five-year age intervals beginning at age 15 and running up to age 74. The final 75+ category is open-ended. All data sources and algorithms are reported in appendix A.

This is perhaps the appropriate point to note several caveats to the analysis. First, since aggregate data are used in the calculations, inferences regarding individuals within cohorts are difficult and, at times, hazardous. Whether the present value of benefits equals that of taxes for any individual or group of individuals within a cohort cannot be ascertained. A fortiori, only intergenerational transfers created by Social Security are presented here; intragenerational transfers are not examined. Second, it should be pointed out that welfare inferences based on these calculations are also hazardous. Since individuals can adjust their saving behavior, their dates of retirement, their earnings amounts over their lifetime, and their family types (they can sometimes alter the type of benefit they receive), the ultimate value of the net transfer is to a certain extent endogenous. This problem is common to virtually all studies of the distributional impact of transfers. Third, no wealth values are calculated for cohorts who have not yet reached retirement age. Since their future taxes and benefits are subject to legislative changes, their wealth values are inherently a matter of speculation.[3]

9.2 Results

9.2.1 Benefit and Tax Trends

Table 9.1 shows the mean real monthly benefit paid to each of the eight cohorts when they reach the 65–69 age category. Each cohort is denoted by the year in which the cohort reached the median age in this category (67). All dollar amounts in this paper are in real 1967 dollars. As the table indicates, benefits have always been greatest for retired male workers, as should be expected on the basis of their high earnings profiles. However, neither benefits for men nor for the three categories of women have risen smoothly over time. Nominal benefits were unchanged between the Social Security Amendments of 1939 and 1950, causing real benefits to fall over this period. Hence the 1947 cohort began at a lower level than the 1942 cohort. However, the 1950 Amendments greatly increased benefit levels, the percentage increase ranging from 47 to 63 percent depending on the benefit type. These benefit increases applied across the board and increased the benefits of all retirees at all ages, not just new

Table 9.1 Benefit Amounts and Replacement Rates by Cohort[a]

	Monthly Benefit at Age 65–69				Benefit Replacement Rate at Age 65–69[b]			
Cohort[c]	Retired Males	Retired Females	Wives	Widows	Retired Males	Retired Females	Wives	Widows
1942	47	41	27	41	.23	.36	.13	.20
1947	44	32	22	32	.20	.36	.10	.15
1952	67	47	35	52	.23	.34	.12	.18
1957	91	67	44	63	.29	.45	.14	.20
1962	101	72	46	77	.29	.45	.13	.22
1967	96	74	43	82	.25	.38	.11	.21
1972	149	117	69	116	.25	.49	.15	.25
1977	155	119	71	126	.32	.46	.14	.25

[a]All dollar amounts are in real 1967 dollars.

[b]Benefit as percent of earnings at age 62. Male earnings used for all but retired females.

[c]Year in which cohort is age 67.

retirees. Real benefit growth was substantially lower in the subsequent years, and even fell again in real terms in the early 1960s, another period of a faster price growth than nominal benefit growth. A second explosion of benefits occurred in the late 1960s and early 1970s, generating real benefit increases comparable in percentage terms to those of the early 1950s.

The table also shows the replacement rates of those in the 65–69 age category for each cohort, representing the ratio of benefits to the earnings of the same cohort five years earlier. Although replacement rates have wavered quite a bit, they have very slowly increased for some benefit types. On the whole, however, there have been no major changes in their values.

Figure 9.1 shows the benefit profiles of male retirees of each cohort as it aged from the 65–69 category. Benefits change over time for a cohort for several reasons: new members of the cohort retire, perhaps at different (presumably larger) benefit levels; other members of the cohort die, probably with lower benefit levels; women change from dependent to

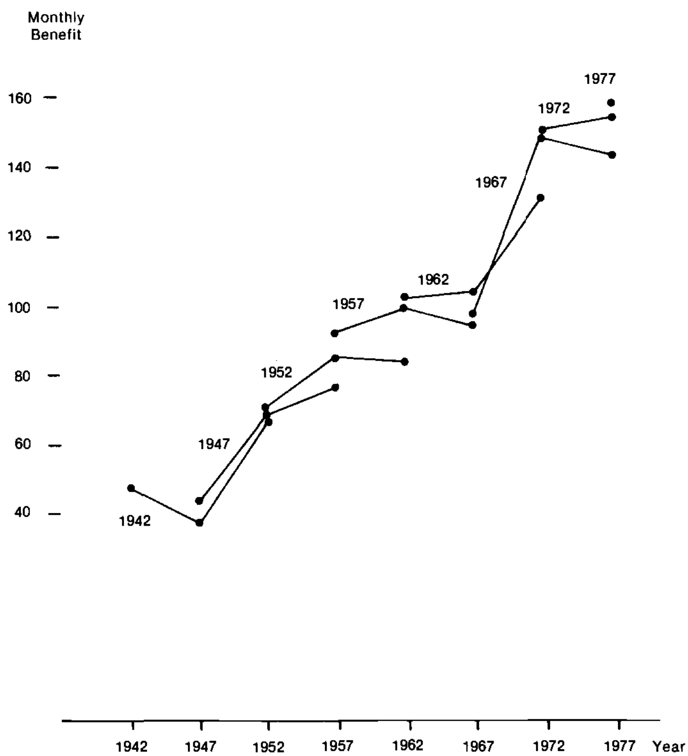

Fig. 9.1 Benefit profiles for retired-male cohorts (cohort year = year of age 67): ages 65–69, 70–74, 75+

survivor status, probably with an increase in the benefit level; and legislation or lack of it allows the real value of benefits for the same individual to change. The figure indicates the last of these effects completely dominates the life-cycle growth of benefits during retirement. Sharp increases in benefits occurred in the early 1950s and late 1960s, regardless of the age of the recipient. In addition, the shape of the profile varies greatly from cohort to cohort; it is sometimes convex, sometimes concave, sometimes relatively flat (as during the late 1950s and early 1960s). This extreme unevenness would seem to pose some problems for the standard life-cycle model with complete certainty, for it is difficult to see how these benefit profiles could have been correctly anticipated.

Table 9.2 shows the number of recipients per capita of each type at the base age range 65–69. Although more than 80 percent of men and women in the 1977 cohort received benefits, only 8 percent of men and 5 percent of women in the 1942 cohort did. These extremely low recipiency rates should cast some doubt on the extent to which early cohorts did well under the system, for while those actually receiving benefits may have done famously, very few actually received them (presumably because they had not accumulated sufficient quarters of covered earnings). Unlike the standard model of a pay-as-you-go system in which all the elderly are immediately blanketed into the system at its start, in the U.S. system eligibility was highly restricted in the beginning.

Figure 9.2 shows the recipiency rate profiles for male retirees in each cohort. Unlike the benefit profiles, here the shapes are consistently concave over time. Recipiency rates rose more rapidly for the early cohorts as they aged, probably because a disproportionately large number became eligible (i.e., attained insured status) at later ages. In addition, as recipiency rates approach 100 percent, there must by necessity be a leveling-off of the profiles.

Table 9.3 shows some of the relevant trends affecting tax payments

Table 9.2 Recipients Per Capita at Age 65–69

		Females			
Cohort	Retired Males	Total	Retired Females	Wives	Widows
1942	.08	.05	.01	.03	.01
1947	.12	.11	.02	.06	.03
1952	.30	.29	.11	.12	.06
1957	.52	.58	.26	.22	.10
1962	.66	.74	.35	.25	.14
1967	.70	.78	.41	.22	.15
1972	.78	.83	.47	.20	.16
1977	.84	.87	.52	.19	.16

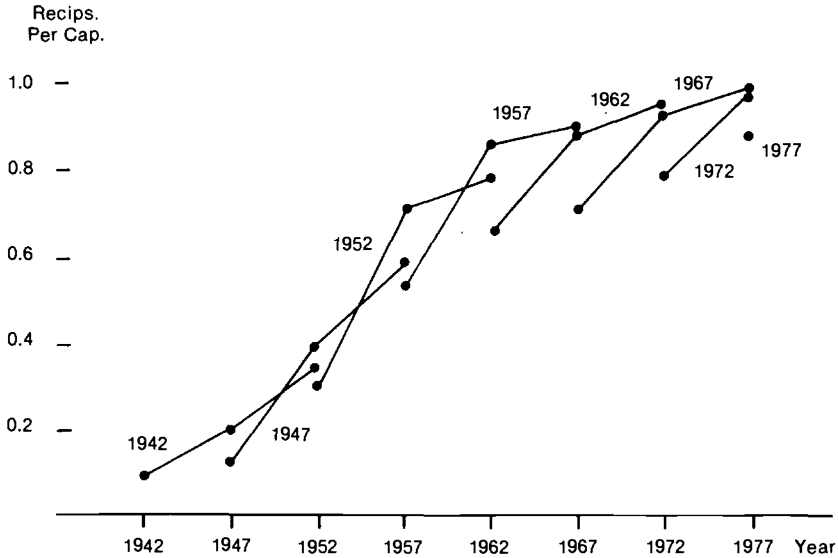

Fig. 9.2 Cohort profiles of male recipients per capita: ages 65–69, 70–74, 75+

over the period since 1937. Notably, tax rates stayed quite low until the early 1960s, when they began to rise steadily. As a consequence, the cohorts considered here paid very little tax into the system. Even the latest cohort considered in this paper, that aged 67 in 1977, was already 50 years old in 1960 when the tax rates began to rise. Hence, the peak of the earnings profile had passed or was near to passing. The table also shows that the real value of the taxable maximum has gone through uneven

Table 9.3 **Trends in Tax Payments and Coverage**

Year	Tax Rate[a]	Annual Taxable Earnings Maximum	Fraction of Covered Workers at Maximum	Covered Male Workers Age 40–44 Per Capita
1937	.010	9,646	.03	.54
1942	.010	8,174	.08	.69
1947	.010	5,682	.21	.67
1952	.015	5,816	.27	.82
1957	.020	6,213	.29	.92
1962	.029[b]	6,522	.30	.91
1967	.036[b]	8,118	.25	.91
1972	.041[b]	9,000	.24	.89
1977	.044[b]	11,752	.14	.89

[a]OASI only. Employers and employees each.
[b]Rounded off from a number with more significant digits.

changes over the period, also presumably difficult to forecast. The real maximum declined from 1937 to 1947 and rose thereafter. But apparently it did not rise as fast as earnings, for the percent of covered workers paying the maximum tax rose steadily until 1962, after which it declined as the real maximum accelerated. The increases in the percentage of workers hitting the taxable maximum reinforces the effect of low marginal taxes and lowers further the percentage of earnings actually paid in the form of taxes for these cohorts.

9.2.2 Social Security Wealth

The value of Social Security wealth, S, is calculated as the difference between the present value of benefits, SB, and taxes, ST. The term "Social Security wealth" as used in this paper will always refer to *net* wealth (net of taxes, that is). It will be zero in an actuarially fair system. The benefit value is calculated as:

$$\text{(1)} \qquad SB = \frac{1}{N_{17}} \sum_{k=1}^{4} \sum_{a=62}^{75+} \frac{R_a^k \, B_a^k}{(1+r)^{a-17}},$$

where R_a^k denotes the number of recipients of benefit type k at age a, B_a^k is the mean real benefit of type k at age a, N_{17} is the population size at age 17, and r is the real rate of interest. In most of the calculations, r is assumed to equal .03, as assumed by FMLL, although S is also calculated for other interest rates. The trends in wealth across cohorts are not significantly affected by this choice, although obviously the absolute amount of calculated wealth will be. It should be noted too that a few projections of benefits are required for the calculation of SB, namely (1) the benefits of those aged 75+ for the 1972 cohort and (2) the benefits of those aged 70–74 and 75+ for the 1977 cohort. For these projections, benefits are assumed to grow over these age ranges at the same rate as they did for the previous cohort. As an approximation this should be sufficiently close to probable actual experience.

It should also be noted that SB is divided by the number of individuals alive at age 17, putting the wealth measure on a per capita basis. Thus SB represents the aggregate value of all benefits received by all members of a cohort, but on a per capita basis. This definition will become important below, for it is not the same as the wealth value of recipients only—it includes all those who die before reaching retirement age and those who reach retirement age but do not receive benefits. As a result, the measure SB can grow as a result of increased life expectancy and increased coverage and recipiency rates, as well as from increased benefit levels for those who receive benefits. Although the growth of benefits for recipients alone is of some interest by itself, the measure here is the more comprehensive one necessary to compare each cohort as a whole to each other cohort as a whole.

The present value of tax payments is the following:

(2) $$\mathrm{ST} = \frac{1}{N_{17}} \sum_{a=17}^{75+} \frac{C_a \, T_a}{(1+r)^{a-17}},$$

where C_a is the number of covered workers at age a, and T_a is the mean tax payment at age a per covered worker. Both are equal to zero if the cohort is at an age prior to 1937. The tax payment is calculated as:

(3) $$T_a = p_a \left[u_a \, Y_a + (1 - u_a) \, YM_a\right] + p_a \left[u_a \, Y_a + (1 - u_a) \, YM_a\right](1 - s_a),$$

where u_a is the estimated fraction of the cohort at age a whose earnings are below the taxable maximum, p_a is the payroll tax rate at age a, Y_a is the value of earnings conditional on being below the maximum, YM_a is the value of the taxable maximum earnings at age a, and s_a is the non–Social Security personal tax rate on earnings. The tax payment is composed of an employee component and an employer component, with the latter deflated by $(1 - s_a)$ because it is not subject to tax. Note that the usual assumption of complete shifting of the employer portion onto the employee is followed here. Finally, the value of Social Security wealth is $S = \mathrm{SB} - \mathrm{ST}$.

Before presenting the results of the wealth calculation, the basic principles of a developing pay-as-you-go system should be briefly mentioned (Samuelson 1958; Diamond 1965; Aaron 1966). In a simple economy in which real wages grow at the rate g and the labor force grows at the rate n, a pay-as-you-go system in which all tax receipts are immediately paid out as benefits can attain a long-run equilibrium under which each individual obtains a rate of return $(n + g)$ on his payroll contributions. Both productivity growth and labor-force growth allow each cohort to "borrow" against future generations at this rate in Ponzi fashion. If the interest rate r is equal to $(n + g)$, the cohort could have done equally well with private savings and hence the program is actuarially fair. If r is greater (less) than $(n + g)$, the program is less (more) than actuarially fair and each cohort receives a negative (positive) lifetime net wealth increment. However, in the beginning such a system must give the first generation of retirees a net rate of return greater than $(n + g - r)$, for these cohorts did not pay a full lifetime of taxes but receive the full amount of receipts from current workers. Therefore in the immature phase of the system the value of the intergenerational transfer should fall, at least relative to wage growth, and should approach some equilibrium level.

Main Results

The results of the net wealth calculation for the eight cohorts are shown in table 9.4. As the table indicates, each member of the cohort born in 1892 who was alive at age 17 (i.e., in 1909) received a net present value of

Table 9.4 **Trends in Social Security Wealth By Cohort (1967 dollars)**

Cohort	*S*	Absolute Change	Five-Year Growth Rate (%)
1942	$ 24	$ 39	163
1947	63	82	130
1952	145	95	66
1957	240	116	48
1962	356	88	25
1967	444	100	23
1972	544	53	10
1977	597	—	—

$24. The absolute size of this number is small because (1) it is discounted back to age 17 since that is the beginning of the life cycle (multiply by about four to get age-65 values); (2) it is in 1967 dollars; and (3) it includes many nonrecipients, almost 70–90 percent of the members of the first cohort (see figure 9.2). More important is the *relative* size of the wealth values across cohorts. For the 1977 cohort, *S* was $597, about 25 times greater—implying an average annual growth rate (in real terms) of about 14 percent. The results immediately answer some of the basic questions regarding trends in Social Security wealth. First, it has risen in absolute value for all cohorts reaching retirement age up to 1977. This is not incompatible with an immature, or developing, pay-as-you-go Social Security system, but it is also not necessary; in the usual model of such a system the absolute value of wealth falls over time. To the extent that the caveat about welfare implications mentioned above is ignored, it appears that the absolute size of the intergenerational transfer received by more recent cohorts is larger that that received by early cohorts. Second, however, the growth rate of the wealth value has indeed slowed over time, consistent with expectations. The absolute value of the difference from one cohort to the next rose until the 1960s and appears to have begun falling by 1977. The growth rate of wealth, exceedingly large at first, has fallen with every succeeding cohort.

Components of Growth

Equally important is the determination of what has caused this particular growth pattern. Table 9.5 breaks down the net wealth values into their benefit and tax components (SB and ST) and subcomponents. The table shows that growth in benefits has dominated the growth in net wealth, for changes in net wealth were almost entirely determined as a result of significant benefit growth combined with tiny tax growth (SB grew from $27 to $815 while ST only from $4 to $218). ST remained small and grew very little in absolute terms until the 1970s. The subcomponents of SB

Table 9.5 Components of Growth in Social Security Wealth (S = SB − ST)

	SB[a]					ST[a]		
Cohort	Total	Retired Males	Retired Females	Wives	Widows	Total	Males	Females
1942	$ 27	$ 19	$ 3	$ 3	$ 3	$ 4	$ 3	$ 0[b]
1947	71	46	10	7	9	8	7	1
1952	161	97	30	15	20	17	14	2
1957	270	149	62	25	34	30	25	5
1962	408	202	108	33	65	52	41	11
1967	533	246	158	37	92	89	68	21
1972	693	321	224	43	105	148	110	38
1977	815	365	262	43	144	218	156	61

[a]Components may not add up exactly because of rounding error.
[b]0.3.

show that over most of the period the benefits of male retirees contributed the most in absolute terms to its growth. However, since the 1960s, benefits claimed by women on the basis of their own earnings records (retired females) have grown in approximately the same amounts as those of men. Correspondingly, the growth of benefits claimed by dependent wives has virtually halted. This is an interesting result, presumably caused by the increase in the number of working wives with significant lifetime wage profiles. As wives' earnings increase, the benefits for which they are eligible alone also increase. Since the law automatically grants wives the larger of either the benefit for which they are eligible alone or that for which they are eligible under their husbands' records (usually about 50 percent of his benefit), wives' earnings growth should result in a gradual switching from the wives category to the retired females category.

Table 9.6 shows the results of further decomposing the change in S from cohort to cohort into several parts. The formula for SB can be rewritten as:

$$(4) \qquad \text{SB} = \frac{N_{17}^m}{N_{17}} \sum_{a=62}^{75+} \frac{N_a^m}{N_{17}^m} \frac{R_a^1}{N_a^m} \frac{B_a^1}{(1+r)^{a-17}} + \frac{N_{17}^f}{N_{17}} \sum_{a=62}^{75+} \sum_{k=2}^{4} \frac{N_a^f}{N_{17}^f} \frac{R_a^k}{N_a^f} \frac{B_a^k}{(1+r)^{a-17}},$$

where N_a^m is the size of the male population at age a, and N_a^f is the size of the corresponding female population, and where $k = 1$ denotes male retired-worker benefits, and $k = 2$, 3, and 4 denote the three female benefit types. The change in SB from cohort to cohort may thus be decomposed into changes in (a) the fraction of the cohort that is male at age 17; (b) the sex-specific life probabilities (fraction of population

Table 9.6 **Decomposition of Growth of Social Security Wealth[a] (percentages × 100)**

	Benefits per Recipient				Recipients per Capita			Taxes per Capita					
Cohorts	Total	Replacement Rate[b]	Benefit Growth	Earnings[c]	Total	Basic[b]	Growth	Total	Taxes per Covered Worker	Coverage Rate[d]	Level of Employment	Life Probabilities	Age in 1937
1942–1947	16	−9	28	1	65	55	11	−4	0	−4	1	6	−7
1947–1952	19	12	−19	33	58	148	−30	−4	0	−3	0	7	−6
1952–1957	29	41	−21	13	61	143	−43	−7	−3	−1	−2	7	−7
1957–1962	57	0	28	26	34	69	−27	−11	−7	−2	−2	6	−8
1962–1967	65	−63	72	67	36	38	−1	−27	−16	−7	−2	19	−14
1967–1972	101	155	−120	102	18	53	−33	−40	−27	−6	−3	26	−15
1972–1977	87	−62	35	117	86	85	5	−99	−84	−13	4	44	−35

[a]Numbers for each cohort pair calculated as $(S^i_{t+1} - S_t)/(S_{t+1} - S_t)$, where S_t is the actual net wealth value for cohort t (see table 9.4), and S^i_{t+1} is the value of wealth which cohort $t+1$ would have had if variable i had changed but all other variables had remained at cohort t values. Since the decomposition is only a first-order Taylor series approximation, horizontal sums do not sum to 100.

[b]At age 65–69.

[c]At age 60–64.

[d]Number of covered workers divided by level of employment.

surviving to each age); (c) the benefit recipiency rate per capita; and (d) the size of the benefit.

The formula for ST can be rewritten as the following:

$$\text{(5)} \qquad \text{ST} = \frac{N_{17}^m}{N_{17}} \sum_{a=17}^{75+} \frac{N_a^m}{N_{17}^m} \frac{C_a^m T_a^m}{N_a^m} \frac{1}{(1+r)^{a-17}} + \frac{N_{17}^f}{N_{17}} \sum_{a=17}^{75+} \frac{N_a^f}{N_{17}^f} \frac{C_a^f T_a^m}{N_a^f} \frac{1}{(1+r)^{a-17}}.$$

Thus the growth in ST can be decomposed into changes in the fraction of the population that is male at age 17; changes in life probabilities; and changes in per capita taxes paid.

Table 9.6 shows the results of computing the fractions of the change in *S* from cohort to cohort that result from each of these factors alone. To interpret the table, compare the relative magnitudes and signs of the percentages horizontally, across the rows. (The percentages need not add to 100—see the table.) For example, 65 percent of the change in *S* from the 1942 cohort to the 1947 cohort was a result of a change in the recipiency rate; only 16 percent was a result of changes in the benefit. Increased taxes account for only a small −4 percent of the change; growth in life expectancy for only a +6 percent; and the fact that the later cohort started paying taxes at an earlier age and hence paid more taxes accounted for a relatively small −7 percent. The table also shows a decomposition of benefit growth into growth in the basic 65–69 benefit replacement rate, changes in benefits over the retirement period, and changes in earnings; a decomposition of the change in the recipiency rate into changes in the basic recipiency rate at age 65–69 and the growth of recipiency over the retirement period; and a decomposition of changes in per capita taxes into portions resulting from changes in taxes paid per covered worker, coverage as a percent of employment, and the employment rate (employment per capita). See appendix A for an exact statement of the decomposition. The results show that the growth in benefits between the 1942 and 1947 cohorts was mostly a result of what is called benefit growth—that is, growth of benefits *during* retirement (i.e., after age 69). This can be seen back in figure 9.1 as well. On the other hand, the growth in the recipiency rate appears to be mostly a result of growth in the basic (i.e., age 67) recipiency rate, rather than in the growth rate of recipiency during retirement. Finally, the wealth-depressing effect of tax growth appears to be almost entirely a result of growth in coverage for the 1942–1947 change rather than from changes in tax rates or employment growth.

Moving down the table, the magnitudes often grow in absolute value. This is just a result of the fact that, as taxes grow, benefits must also grow to produce an equivalent net wealth increase. The more important point is that the relations between the magnitudes within horizontal rows of the table change over time.[4] In the early years of the program most of the growth was a result of increases in the recipiency rate, rather than changes in the benefit, as just mentioned for the 1942–1947 change. However, the importance of the latter has gradually increased and that of the former has fallen, with the result that benefit growth has been more important quantitatively since the 1950s. This should be expected on the basis of the leveling-off of recipiency growth discussed previously. Also, it appears that the determinants of the change in the benefit itself have fluctuated dramatically, sometimes more a result of a higher age 65–69 benefit (the replacement rate column) and sometimes more a result of a higher growth rate of benefits at later ages (the benefit growth column). Again, figure 9.1 demonstrates why this instability is to be expected. Simple growth in earnings has also apparently accounted for an increasing share of the growth in benefits: with a fixed replacement rate, benefits will naturally rise at the same rate as earnings. There is no particular rationale for this pattern, for it has resulted from the different ways the Social Security formula has been changed over time. The table also shows the determinants of the recipiency rate, where it seems that increases in the basic rate (i.e., age 67) has been more important than the growth of recipiency during retirement in raising net wealth from cohort to cohort.

The depressing effect of taxes paid in has been relatively slight over most of the period presented here, at least until the 1970s. Also, although in the early years what growth did occur in taxes was mainly a result of coverage growth (0 vs. −4 and 0 vs. −3), tax growth since then has resulted more from the basic change in tax payments per covered worker. The growing importance of taxes paid in is also reflected by the growing negative percentage accounted for by age at entry in 1937, for this implies more years of tax payments in the lifetime.

Finally, the results indicate that changes in life expectancy have a net positive effect on the growth of S, although increases in life expectancy increase both benefits and taxes. Although its importance was slight during the early years of the program, it has grown to such an extent that the impact of increased life expectancy amounts in magnitude to almost 50 percent of the net change in S from the 1972 to the 1977 cohorts.

Life-Cycle Patterns of Wealth

Figure 9.3 shows the life-cycle path of cumulative net Social Security wealth for the most recent cohort. The paths of the other cohorts are similar in shape, although each cohort of an older age began paying taxes at a later date. S is negative until the cohort reaches retirement age because only taxes have been paid in. For the cohort in the figure, as well as all the other cohorts, (1) S is always still negative in the 60–64 age range, despite the increased frequency of early retirement, and (2) S is

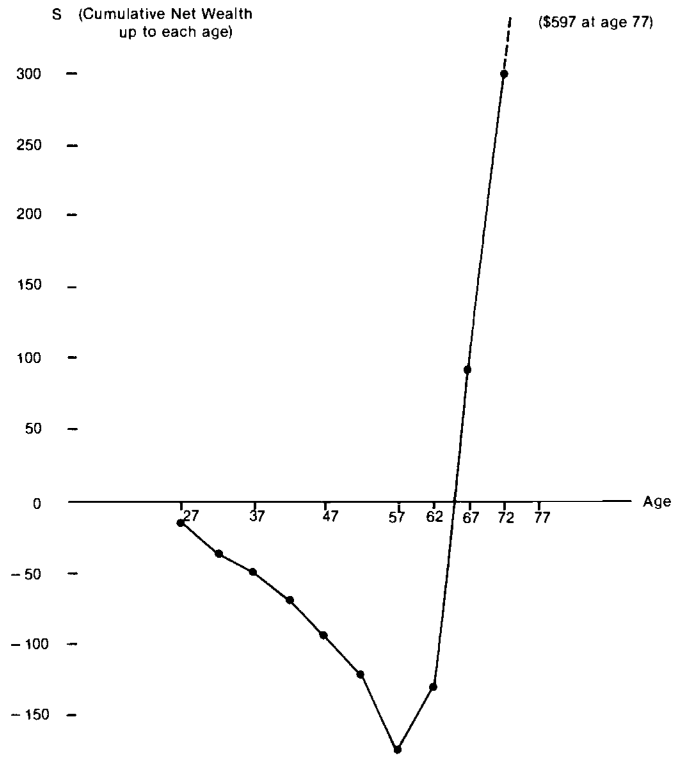

Fig. 9.3 Life-cycle net Social Security wealth profile for 1977 cohort

always positive in the subsequent, 65–69 age range. Thus from the perspective of the cohort as a whole—although not necessarily from that of a particular individual—the system has paid off already by age 69. It is also interesting to note that there is an enormous growth of S in the last age category of 75+. That this holds for all cohorts, not just that in the figure, is demonstrated in table 9.7, which shows the value of S during retirement age for each cohort. The growth rate at the final point, often more than 100 percent, implies an extremely large payoff at older ages. Put differently, if all members of the cohort were to die at age 75, net wealth would often be only one-half of what it actually turns out to be. Thus the receipt of benefits by those aged 75+ constitutes a large fraction, if not the largest, of net wealth.

Alternative Wealth Measures

Table 9.8 provides additional evidence on the growth of S. The first columns show the values of S calculated for different values of r. While the magnitude of S changes in the expected direction, the trends in

Table 9.7 **Life-Cycle Growth of Social Security Wealth (*S*)**

	Age			
Cohort	60–64	65–69	70–74	75+
1942	−2	2	7	24
1947	−5	1	21	63
1952	−12	15	72	145
1957	−24	47	136	240
1962	−29	72	171	356
1967	−46	61	217	443
1972	−97	100	284	544
1977	−137	90	290	597

Table 9.8 **Additional Wealth Measures: Internal Rates of Return, Benefit-Cost, and Earned-Wealth Indicators**

	S			Internal Rate of		Relationship to Earned Wealth	
Cohort	$r = .02$	$r = .03$	$r = .04$	Return	SB/ST	*V*	*S*/*V*
1942	42	24	13	.195	6.8	4,600	.005
1947	112	63	36	.196	8.9	4,565	.014
1952	254	145	83	.197	9.5	4,375	.033
1957	420	240	137	.165	9.0	4,376	.055
1962	627	356	203	.141	7.8	4,839	.074
1967	789	444	249	.116	6.0	5,398	.082
1972	975	544	301	.099	4.7	6,566	.083
1977	1,089	597	321	.085	3.7	7,767	.077

absolute amounts and in growth rates obtained previously are not affected. The table also shows the internal rates of return for each cohort. After remaining more or less constant at around 20 percent (in real terms, recall) for the early cohorts, the rate of return has fallen steadily to about 8 percent for the most recent cohort. That these real rates are considerably higher than .03 or any other possible real rate of return to private savings over this period is just another indication of the large net intergenerational transfer that has been provided to cohorts retiring to date. The decline of these rates of return is again to be expected in a developing system as described above. The table also shows the ratio of SB to ST, the benefit-cost ratio frequently employed as a measure of the generosity of the system. This particular ratio rose for the first three cohorts but, like the rate of return, has fallen since then.

The final columns in the table show the results of an attempt to gauge the importance of Social Security wealth relative to private, earned wealth. Suppose that the present value of lifetime earnings is *V* and that total wealth is thus $W = S + V = V(1 + S/V)$.[5] There is also presumably some cohort utility function $U(W)$. In a growing economy we should expect V and hence W to grow, but in an immature pay-as-you-go Social Security system we should also expect S/V to gradually fall (to zero if the equilibrium is at an actuarially fair level). A case could be made on this basis that it is the change in S/V—rather than the change in the internal rate of return, benefit-cost or cost-benefit ratios, or absolute sizes or growth rates of S—that should determine the relative well-offness of successive cohorts.

Estimates of V are not possible to obtain directly because earnings data by age, which are needed to construct cohort-specific earnings profiles, are not available before 1937. However, these pre-1937 age-earnings profiles can be estimated by extrapolating backward from the post-1937 age-earnings profiles, with due allowance for the general level of economic activity and hence for the Depression. To do this the post-1937 age-earnings data were pooled into a single regression, and an age-earnings profile was estimated (with dummies for World War II and including an index of the general level of earnings) and then used to generate an age-earnings profile for each cohort from which a value for after-tax lifetime earned wealth, V, was obtained (see appendix B).

The results of this exercise are shown in table 9.8. As the table indicates, the ratio S/V appears to have risen all the way up to the 1972 cohort, contrary to expectations. Thus, it appears that S has risen at a sufficiently high rate so that successive cohorts through the early 1970s appear to actually have been made better-off by the system than previous cohorts! This arises simply because S, though growing at steadily lower rates, has nevertheless continued to grow at a faster rate than earnings.

This result does not appear to be a consequence of an underestimate of the growth rate of V. To be sure, the results of the regression exercise produce a V that actually fell for the first three cohorts in the table. The explanation for this trend arises from the fact that the Depression occurred at a more crucial stage in the lifetime working careers of the 1947–1957 cohorts than the 1942 or later cohorts. Whereas, for example, the 1942 cohort was already 54 years old in 1929—the working career almost over and the earnings profile already dipping—the three successive cohorts were anywhere from 39 to 49 years old in 1929, at the peak of their earnings profiles. The depressing effect on lifetime earnings was consequently disproportionately large for the latter groups. Nevertheless, to check the accuracy of the S/V calculation, ratios of S to cohort earnings at various 1937 wages were also calculated, ratios requiring no estimation procedures at all. The results, shown in appendix B, show precisely the same pattern as that of S/V in table 9.8.

For the eight cohorts examined here this also means that a conventional inequality calculation will show that the Social Security system has increased inequality. For example, the coefficient of variation of V over the eight cohorts is 16, whereas that of $(S + V)$ is 18. Across these particular eight cohorts, that is, the better-off have been made still better-off. Of course, this is to a great extent a misleading analogy with conventional distributional criteria, for there has been no redistribution from earlier cohorts to more recent cohorts except in the negative sense that there was a failure to redistribute more, intergenerationally speaking, toward the early cohorts. The point is, however, that all the net wealth increments are intergenerational transfers from future cohorts to current cohorts, and the fact that S/V has been rising implies only that the more recent cohorts have been redistributing more, proportionately speaking, from future cohorts than previous generations did. Moreover, since an increase in S/V cannot continue indefinitely in a pay-as-you-go system—indeed, it has already begun to fall—it is to be presumed that an extension of this analysis to future cohorts would be capable, at some point, of generating a reduction in the coefficient of variation measured across all cohorts.

One puzzle remains: How could S/V rise at all for so long in a pay-as-you-go system? The answer, it turns out, is that the system was not in fact pay-as-you-go until the mid-1960s. When benefits began to be paid in 1940, benefit levels were far below what they could have been if all tax receipts (or even most of them) had been disbursed. In 1940, in fact, the trust fund was 40 times the size of benefit payments. The fund gradually fell over the following two decades until the mid-1960s, where it has stabilized at a level deemed appropriate for contingencies only (i.e., sudden shortfalls in revenues). Thus the intergenerational transfer was intentionally kept low for the early cohorts.

9.2.3 Remarks on Interpretation and on Future Trends

It may be helpful in interpreting these results to put them into context by comparing them with other Social Security wealth measures. The wealth measure presented here is simple in concept: it measures the amount each cohort put in and the amount each got out. Aside from having to project a few benefit amounts for the most recent cohorts, all the numbers used in these calculations are actual magnitudes of taxes and benefits historically paid and received. This is a much simpler and more straightforward task than is the calculation of other wealth measures in the literature, most of which require assumptions regarding the expectations of individuals. For example, estimating the wealth of cohorts not yet retired requires not only estimating what benefits and taxes will be in the future, but also how cohorts at each age will perceive those benefits and taxes. Even in the wealth measure considered by FMLL, which is intended to be a historical measure, it is assumed that each cohort at each age forms a perception of its own wealth only loosely based on actual past experience or actual future experience. Thus, for example, much of the discussion of the FMLL wealth measure has revolved around the appropriateness of different expectational assumptions. In the wealth measure constructed in this paper, on the other hand, no such issues arise because no decisions of this type are necessary in its construction. The study here is closely analogous to studies of the distribution of transfer benefits, inasmuch as both are examinations, to the greatest extent possible, of actual benefits received. In addition, although different wealth measures are appropriate for different purposes, a measure showing simply how well different cohorts have actually done historically seems quite important to examine. In fact, as mentioned at the beginning of the paper, it is surprising that it has not been examined before.

The wealth measure here is also similar to those used in transfer-benefit studies in the respect that both generally ignore behavioral effects. For example, to the extent that individuals have retired early to obtain higher wealth increments, the present values presented here are an exaggeration of true welfare measures. It is for this reason that the FMLL measure estimates wealth assuming an age 65 retirement for all, but such a restriction is not appropriate when one is simply measuring actual benefits received.[6] As mentioned at the beginning of the paper, the welfare implications of the measures presented here are consequently clouded by this possibility, and by the questions of the extent to which private saving is displaced and the extent to which a stream of unexpected changes in wealth yields lower utility than the same stream had it been expected.

Although future trends in Social Security wealth have not been considered here, the results may have some implications for such trends. There are again two different questions: What will actually happen? What do current cohorts perceive will happen? What will actually happen is, of course, up to the U.S. Congress and can only be a matter of political speculation. What is more interesting is the nature of the constraints within which Congress will have to operate. Clearly the net wealth increment for future cohorts must be smaller than it has been for those considered in this paper, as a result of the maturation of a pay-as-you-go system. But unless productivity growth and labor-force growth are extremely low over the next 30–40 years, a positive net wealth increment will be possible on average. However, since the lump in the age distribution will pass through the high-earnings range in the next decade or two, maintaining a more-or-less constant net wealth increment will require building up a transitional trust fund for the financing of later benefits. To have a pay-as-you-go system on average, the surplus and deficit years must cancel out in the long run only.

Regarding how current cohorts perceive their future wealth, and therefore how their current behavior is affected, the calculations here raise the question of the relative importance individuals attach to past historical trends rather than to the future possibilities just mentioned. If individuals only examine past historical trends, the results presented here should generate the expectation of a much more generous system in the future than now, for the absolute value of the net wealth increment has risen continuously for all cohorts retired to date. Although the growth rate of that increment has fallen, it is still positive and large. Any type of adaptive expectations model would presumably generate this kind of result. Yet the more unfavorable possibilities for the future appear to have gained widespread recognition. Consequently, where the average citizen's opinion of the future lies—between the extremes of a more generous system and a possibly bankrupt one—is a question I leave to more intrepid analysts.

9.3 Summary

Net Social Security wealth, equal to the present value of benefits minus taxes, has risen in absolute value for all cohorts having reached retirement age since the inception of the Social Security system. However, the absolute change in wealth and its rate of growth have fallen. The growth of wealth thus far has been predominantly a result of benefit growth; taxes have affected net wealth very little, though this will change for future cohorts. Beyond this, the exact determinants of the growth in wealth have fluctuated a great deal over time, being a result at differing times of changes in recipiency rates, benefit-replacement rates, growth rates of benefits over the retirement period, and life probabilities. The one unexpected finding was that net Social Security wealth grew faster than earnings all the way into the 1970s, implying that cohorts retiring later have been made better-off in proportionate terms than cohorts retiring earlier.

Appendix A *Wealth Algorithms and Data Sources*

The value of net Social Security wealth, S, is calculated for each cohort as the difference between the present value of benefits, SB, and the present value of taxes, ST. The formula for SB is:

$$\begin{aligned} \mathrm{SB} = {} & F_{17}^{m} Y_{62}^{m} \mathrm{RR}_{67}^{1} \mathrm{BR}_{67}^{1} \sum_{a=62}^{75+} \frac{P_a^m G_a^1 H_a^1}{(1+r)^{a-17}} \\ & + F_{17}^{f} Y_{62}^{f} \mathrm{RR}_{67}^{2} \sum_{a=65}^{75+} \frac{P_a^f G_a^2 H_a^2}{(1+r)^{a-17}} \\ & + F_{17}^{f} Y_{62}^{m} \sum_{k=3}^{4} \mathrm{RR}_{67}^{k} \mathrm{BR}_{67}^{k} \sum_{a=65}^{75+} \frac{P_a^f G_a^k H_a^k}{(1+r)^{a-17}}, \end{aligned}$$

where

$F^i_{17} = N^i_{17}/N_{17}$ (see text), sex i;

Y^i_{62} = annual earnings of workers of age 60–64, sex i;

RR^k_{67} = recipiency rate of benefit type k, equaling R^k_{65-69}/N^i_{65-69}, where $i = m$ for $k = 1$, and $i = f$ for $k = 2, 3, 4$;

$BR^k_{67} = B^k_{65-69}/Y^i_{62}$, where $i = m$ for $k = 1$; and $i = f$ for $k = 2$; and $i = m$ for $k = 3, 4$;

$P^i_a = N^i_a/N^i_{17}$, sex i;

$G^k_a = B^k_a/B^k_{67}$;

$H^k_a = RR^k_a/RR^k_{67}$.

Here $k = 1$ if a male retired worker; $k = 2$ if a female retired worker; $k = 3$ if a wife; and $k = 4$ if a widow. This formula was used in the decomposition reported in table 9.6, with BR representing the replacement rate; G representing the growth rate of benefits during retirement; Y^i_{62} representing earnings in that table; RR^k_{67} representing the basic recipiency rate; and H representing the growth rate of recipiency during retirement.

The formula for ST is:

$$ST = F^m_{17} \sum_{a=17}^{75+} P^m_a E^m_a W^m_a T^m_a \frac{1}{(1+r)^{a-17}}$$

$$+ F^f_{17} \sum_{a=17}^{75+} P^f_a E^f_a W^f_a T^f_a \frac{1}{(1+r)^{a-17}},$$

where

E^i_a = employment of sex i at age a, divided by N^i_a;

W^i_a = number of covered workers of sex i at age a, divided by E^i_a;

T^i_a = estimated tax payments of covered workers of sex i at age a

$= p_a(2 - s_a)\,[u^i_a\, YB^i_a + (1 - u^i_a)\, YM_a]$;

p_a = payroll tax rate at age a;

s_a = non-Social-Security tax rate at age a;

u^i_a = fraction of workers of sex i at age a below the taxable maximum;

YB^i_a = mean earnings of sex i at age a if below YM_a;

YM_a = taxable maximum earnings level at age a.

The estimate of u^i_a assumes that earnings among covered workers is distributed exponentially, as appears to be the case (see the *Annual Statistical Supplement of the Social Security Bulletin, 1977–1979*, p. 93). Under the exponential assumption it can be shown that

$$u_a^i = 1 - \exp[-\mathrm{YM}_a/(1.44\, Y_a^i)],$$

where the factor of 1.44 is introduced to convert median earnings to mean earnings. The formula for the truncated mean of an exponential distribution can also be used to generate a value for earnings below the maximum:

$$\mathrm{YB}_a^i = 1.44\, Y_a^i\, u_a^i - \mathrm{YM}_a\,(1 - u_a^i).$$

The above formulation of ST was used in the decomposition reported in table 9.6, with taxes per covered worker represented by T_a^i, coverage represented by W_a^i, and employment by E_a^i.

The data sources are as follows:

(1) Population by age and sex, post-1937: Leimer and Lesnoy 1980 (LL), appendix G; pre-1937: interpolated from decennial census figures from 1900–1940 Censuses.

(2) Number of recipients of each benefit type by age: LL, appendix G.

(3) Number of covered workers by sex and age: LL, appendix G.

(4) Payroll tax rate from 1937: *Annual Statistical Supplement (ASS) of the Social Security Bulletin, 1977–1979.*

(5) Taxable maximum earnings levels: *1977–1979 ASS.*

(6) Median earnings by age and sex since 1937: *1977–1979 ASS*, p. 90; *1972 ASS*, p. 63; and *1968 ASS*, p. 55.

(7) Non-Social-Security tax rate by year: ratio of tax payments to personal income from National Income and Product Accounts.

(8) Employment by sex and age: *1980 Handbook of Labor Statistics*, table 18, for post-1947; interpolated from employment and age-specific, labor-force data for 1937–1946 reported in *Historical Statistics of the United States*, U.S. Bureau of the Census.

(9) Benefits by type by age: *annual ASS* and *Social Security Yearbooks* from 1940 to date.

(10) Current Price Index used to deflate all nominal values: *Historical Statistics*, p. 210.

Appendix B *Estimation of After-Tax Earned Wealth*

The formula for V, the after-tax value of cohort earnings discounted to age 17, is:

$$V = F_{17}^{m} \sum_{a=17}^{75+} P_a^m E_a^m \frac{(Y_a^m + \mathrm{TE}_a^m)(1 - s_a)}{(1+r)^{a-17}}$$

$$+ F_{17}^{f} \sum_{a=17}^{75+} P_a^f E_a^f \frac{(Y_a^f + \mathrm{TE}_a^f)(1 - s_a)}{(1+r)^{a-17}}$$

where TE_a^i is the employer portion of the payroll tax, and all other variables are as defined in appendix A. Note that the employer portion of the tax is added to observed earnings to be consistent with the shifting

Table 9.A.1 Post-1937 Earnings Regressions[a]

	Male	Female
Age (A)	.36*	.33*
Age Splines:[b]		
22+	−.20*	−.33*
27+	−.11*	−.02
32+	−.02	.06
37+	−.03	−.02
42+	.00[d]	.00[d]
47+	−.02	−.04
52+	.00[d]	.00
57+	−.03	−.06*
62+	−.17*	−.09*
67+	.08*	−.06*
72+	−.01	.02
Log W[c]	1.28*	2.10*
Max (log W − 4.5, 0)	−.93*	−.43*
World War II dummy: = 1 if year is 1942, 1943, 1944, or 1945	.06	−.19*
Constant	−6.29*	−10.00*
R^2	.94	.93

*Significant at the 10 percent level.

[a]Dependent variable: logarithm of $E_a^i(Y_a^i + \mathrm{TE}_a^i)$.

[b]Of the form: Max ($A - A_i$, 0), where A_i is the denoted age.

[c]W = real average weekly earnings of production workers in manufacturing by year (source: *Historical Statistics*, p. 169, and 1980 *Handbook of Labor Statistics*, p. 188).

[d]Less than .005 in absolute value.

Table 9.A.2 **Wealth-Earnings Ratios by Cohort**

Cohort	S/Y^m_{60-64}	S/Y^m_{55-59}	S/Y^m_{50-54}
1942	.010	[a]	[a]
1947	.024	.024	[a]
1952	.042	.047	.051
1957	.064	.063	.070
1962	.085	.085	.089
1967	.095	.094	.099
1972	.098	.103	.107
1977	.099	.096	.105

[a]Earnings data not available.

assumption employed in the calculation of ST. Note too that Y represents conditional earnings (i.e., of workers only); it must be deflated by the employment rate to obtain per person earnings in the entire cohort.

The terms in V involving ages after 1937 can be obtained from the data reported in appendix A, but portions of each cohort's profile prior to 1937 cannot. Nor are employment data by sex and age available prior to 1937. Instead, all the cohort age data post-1937 were pooled into a single regression and the earnings equations shown in table 9.A.1 were estimated. The results were used to impute a value for expected earnings pre-1937 (or, more precisely, a value for the employment rate times the sum of full earnings—see the footnotes to the table). Implicitly it is assumed that the shape of the age profile remained unchanged prior to 1937; only the intercept, changing as a result of the average manufacturing wage, was altered. Because this imputation is obviously subject to some error, ratios of V to available post-1937 annual male earnings were also calculated. The results are shown in table 9.A.2. As the table indicates, the trends are the same as those in S/V reported in the text.

Notes

1. There is also the question of the extent to which the net transfer eventually received by any cohort was actually perceived at younger ages, and there is the need for determining how cohorts not yet retired perceive their Social Security wealth. Still, it would seem preferable to assume that wealth perceptions are based on the actual experience of existing retirees rather than on the latest projections of the Social Security Administration. For one attempt to model perceptions in this fashion, see Moffitt (1981).

2. Another major difference between the wealth value calculated here and that calculated in the FMLL algorithm is that the latter assumes that all individuals at each point in time have the same income, regardless of age. This undoubtedly distorts the shape of true cohort earnings profiles and hence the calculation of tax payments.

3. However, a few projections are made in the calculations below, although only for the remainder of the lifetimes of those who have already retired by 1977.

4. The sex ratio is not shown in table 9.6 because it has stayed virtually constant over the period and hence accounts for none of the change in *S*.

5. Assume no inheritance or other forms of non-life-cycle unearned income.

6. In any case, it would be difficult to do in the context of this paper. Although the benefits of those retiring at age 65 in each year can be obtained separately in the data, the benefit streams of this subset of individuals as they age and their particular lifetime earnings streams cannot be broken out from aggregate data.

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Comment Joseph F. Quinn

The paper by Robert Moffitt has two goals, to provide a systematic examination of the trends in Social Security wealth since the beginning of the system in 1937 and to analyze the causes of these trends. The paper begins with a discussion of the conventional wisdom on Social Security wealth; that

(1) the cohorts that have retired up to now have received far more than an actuarial return on their contributions;

(2) the size of the bonus (the intergenerational transfer) has fallen over time; and

(3) this pattern is exactly what you would expect in a pay-as-you-go system.

Early generations had little time to contribute, and they were able to profit from the growth in productivity and population over the subsequent decades—the chain-letter effect. This paper basically confirms the conventional wisdom, with an exception noted below.

The paper begins with a short description of OASI—the retirement and survivors' components of Social Security. It emphasizes the important point that the relationship between contributions and benefits is very loose. This is certainly true for individuals. Some die early or work forever and therefore never receive benefits; others retire early and live and collect for decades. There are individual winners and losers. But this is also true for cohorts, in which these individual differences wash out. The analogies between Social Security and welfare programs are stronger, I believe, than those between Social Security and pension or insurance plans. This is important because it is the main reason for a study such as this—cohorts as a whole can gain or lose.

The paper follows the actual flows of Social Security contributions

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(from employees and employers) and benefits for eight cohorts of Americans, and asks whether each cohort gained or lost, how much, and why. The cohorts are defined by five-year intervals—the first includes those aged 65–69 in 1942, and the last those aged 65–69 in 1977. No calculations are done on those who have not reached the traditional retirement age of 65, since the books are not yet closed on them. Actually, the books are not yet closed on anyone still alive. Despite the emphasis on actual benefits paid, therefore, some future projections have to be made for the last two cohorts. Moffitt assumes that benefits will grow in the future at the same rate that they did for the previous cohort during the same age intervals (70–74 and 75 +). This probably exaggerates the growth, since it projects the dramatic increases of the early 1970s into the late 1970s and early 1980s. But this is unlikely to alter the basic flavor of the results. All the data, by the way, are aggregate.

Table 9.1 and figure 9.1 show that real benefits have been rising over time, but by no means smoothly. In fact, there were several periods of real decline, and two periods of dramatic increase—the early 1950s and the early 1970s. (This was back in the days when Congress would bring home the bacon periodically [after each 6–8 points of accumulated inflation, it appears] with well-publicized and universally applauded benefit increases. Unfortunately for current representatives, one Congress decided to capture the present discounted value of all future applause and indexed the benefits once and [perhaps] for all.) Since earnings were rising over time along with benefits, the replacement rates in table 9.1 have risen less dramatically than benefit levels alone.

Table 9.2 and figure 9.2 document the dramatic increase in recipiency rates—from under 10 percent of the total cohort aged 65–69 in 1942 to near 90 percent by 1977. Part of this is explained by individuals reaching eligibility by obtaining the necessary quarters of coverage, but most is from the extensions of coverage to new categories of individuals over the years.

Moffitt then turns to the debit side of the ledger—taxes. This side is more difficult, since the aggregate tax data are not available by age and sex. The contributions are therefore estimated on the basis of earnings data (which are available by age and sex) and tax rates. Since only median earnings are available, Moffitt has to assume a functional form for the earnings distribution to determine how many people are over the maximum taxable amount. It is interesting to note how low the maximum contributions were until the 1960s. The youngest group in this sample (those 65–69 in 1977) was already 50 when Social Security taxes really began to rise. This is why they all made out so well, and why we will not.

The heart of this paper brings the two sides together and calculates Social Security *wealth* for each cohort—defined as the difference between the present discount values of benefits and taxes. This is a confusing name, given how wealth is usually defined in the literature. Moffitt is calculating net or windfall wealth, the *increment* in wealth which the system has provided or the excess over what the cohort "deserved." If the cohorts' taxes equaled their benefits, Moffitt's calculated wealth would be 0.

The basic results are given in table 9.4 and are described in somewhat unusual terms. Both the benefit and tax streams are discounted down, with a 3 percent interest rate, to the year in which the cohort was aged 17. The difference (the cohort windfall) is then divided by the entire population of the cohort at age 17. This makes for small numbers. For example, the oldest cohort, aged 15–19 in 1909, received an average increment of $24 each, in 1967 dollars. This is not the annual flow. This is the per capita stock equivalent of all the windfall ahead. Admittedly, $24 long enough ago can be a lot of money. I've read that the $24 the Indians received for the Island of Manhattan, if wisely invested, would be worth more than the entire island is worth today. Oh, for an IRA in 1626.

The age to which one discounts obviously makes no difference to relative magnitudes, which is the central focus of the paper. But dividing by the population rather than by the number of people in the system or the number of eventual recipients does. In the early years, Moffitt is averaging together a much larger average subsidy to those people in the system with the zeros of those who were not. Whether this is appropriate depends on what the purpose of these numbers is—a topic to which I'll return.

With this definition, Moffitt finds that the net Social Security transfer to each succeeding cohort has grown over time, to nearly $600 per person (at age 17 in 1967 dollars) for the last group. This is nearly a tenfold increase in the thirty years since 1947. The increase would be less dramatic if restricted to those in the Social Security system. The rate of growth of the wealth increment has fallen steadily, down to about 2 percent per year by 1977.

Moffitt then decomposes these basic trends in a number of ways. He shows that the increase in the wealth bonus has been dominated by the benefit side—huge benefit increases partially offset by much more modest tax increases. In table 9.6 both the benefit and tax components are further decomposed into such elements as the coverage of the system, benefit and tax rates per person covered, and life expectancy. It is difficult to know what to carry away from this table. Some of the components change so drastically from period to period that generalization seems impossible. For example, the initial replacement rate component of benefits per recipient in table 9.6 changes from −63% to +155% to −62% over the last three cohorts, while benefit growth changes from +72% to −120% to +35%. What do we learn from such erratic movements?

Table 9.8 includes some miscellaneous wealth indicators. It shows that the patterns of wealth bonuses over time are similar under various discount rates (2, 3, and 4 percent). The main point of the paper is restated in terms of internal rates of return. They are always positive, obviously, and far in excess of any realistic real rate of return. They have dropped, however, from nearly 20 percent (in real terms) for the first three cohorts to just under 10 percent for the last two. The chain letter, it appears, is coming to a halt.

In a final interesting set of calculations, Moffitt estimates the proportion of total lifetime earnings that the Social Security bonus represents. In an actuarially fair system, it would be 0. He finds, surprisingly, that the ratio actually rose through 1972 (when it reached 8.3 percent), and has only fallen since then. Although this wealth bonus has been growing at slower and slower rates, it has nonetheless, until just recently, been growing faster than earnings.

This paper describes and discusses a new series on Social Security wealth. It is basically an accounting paper—appropriate for this conference—and an interesting one. It does not focus on either explaining or predicting behavior. My comments have less to do with what is in the paper than with what is not. I would like to suggest how this work might be incorporated into a larger piece which I think would be a very significant contribution to this growing literature.

A lot of concepts of Social Security wealth are in circulation. At the aggregate macro level, there are series by Feldstein (1974), Munnell (1974), Barro (1978), Leimer and Lesnoy (1980), and others. With individual microdata, wealth definitions have been developed by Blinder, Gordon and Wise (1983), David and Menchik (1981), Hurd and Shoven (1981), and Burkhauser and myself (1983). They are proliferating, and it is beginning to become confusing.

Is one of these definitions of Social Security wealth right and the others misguided? No. It is not an issue of right and wrong, but rather of appropriate and inappropriate—to a specific policy question. As I see it, there are two main reasons for a series on Social Security wealth. The first concerns income and wealth distributions. The Social Security system is picking and filling a great number of pockets, and the sums involved are large. One is tempted to ask how it all comes out. How do the rich fare? The poor? Men and women? Single and married persons? Early and later generations? These are interesting questions which require a certain definition of Social Security wealth.

The second major focus is the explanation and prediction of behavior. The Social Security Administration transfers huge sums of money, and it is inconceivable that this transfer does not have behavioral impacts. The major areas studied thus far have been savings behavior, labor supply and retirement decisions and, more recently, bequests. These research problems also require definitions and calculations of Social Security wealth.

What is conspicuously absent from the literature is an exposition of how these various concepts of Social Security wealth differ and which is appropriate for which policy issue.

In the estimation of any of these series, a number of decisions have to be made. These decisions affect the final numbers. Let me mention three.

How should benefits be measured, by what was actually dispersed or by what was expected at some previous time? As an example, there were huge real increases in benefits in the early 1970s, as Moffitt documents. These were huge windfall gains to recipients which, I suspect, were not anticipated. How should they be treated? It depends, obviously, on the question being asked. If the distributional impact of Social Security is being studied, the windfalls should be included in the calculation, as Moffitt does. On the other hand, if one is analyzing the actual retirement decisions of individuals in 1969, these unanticipated real gains are irrelevant. It would be better to base wealth calculations on expected future benefits, regardless of whether these expectations proved accurate or not.

Should benefits be measured as actual or potential? By working beyond 65, an individual reduces his Social Security wealth below what it would have been if he had chosen earlier retirement. Social Security wealth is endogenous because it depends on labor supply decisions. The distributional impact depends on the Social Security benefits actually claimed by an individual or a cohort. Yet it would be a grave error to use this concept in a behavioral study, where an exogenous concept is needed. To use the actual amount would be to reverse causation. Those who continue to work, even if totally unaffected by their retirement income options, will obviously end up with lower Social Security wealth than those who do not. But to deduce that the low wealth (thus misdefined) forced or induced the additional work would be wrong.

A final issue is the treatment of past taxes. Most Social Security wealth series ignore them completely and define current wealth as the discounted stream of future benefits minus any future taxes to be paid. Moffitt's series is different, because all taxes and benefits are counted. Which approach is correct? As always with economic questions, it depends.

It is not clear from this paper what the purpose of these calculations is. Moffitt mentions two motivations: First, this series had never been calculated. Second, the author has an interest in the impact of Social Security on aggregate savings and capital stock. Yet most of the paper seems to deal with intergenerational income redistribution rather than savings behavior.

I will summarize this point, specifically and in general. This paper is weak on why this particular series is of interest. How and why does it differ from other series? What policy question is it designed to answer? In general, wealth series are proliferating. In the absence of an effective freeze movement to counter this proliferation, a paper elucidating the differences between and uses of these series would be a welcome addition.

My last suggestion for additional research is much easier said than done. This is one prerogative of being a discussant—to suggest to others what you know you would not do yourself. The once nearly unanimous support for Social Security is eroding. Much of the current political upheaval on this topic stems from precisely the issue that Moffitt has addressed here. Due to long-run changes in demographic structure and productivity growth, the chain letter is coming to a halt. Many members of the current generation of contributors feel that Social Security will leave them net losers. Do we learn anything from this analysis about whether this conventional wisdom is true or when it will become true? This would obviously require projections of future benefits—an undertaking that Moffitt has wisely avoided. But it might well explain, in very simple terms, an extremely important current additudinal shift.

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