INDIVIDUAL GAINS AND LOSSES FROM SOCIAL SECURITY BEFORE AND AFTER THE 1983 AMENDMENTS

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I. Introduction

Social Security is the major source of income support for retirement in the United States; the Old-Age, Survivors, and Disability Insurance programs (OASDI) will pay benefits of approximately $170 billion in 1983.[1] For many people, Social Security is the main source of retirement income. Exactly what an individual can expect to receive from Social Security is an important question on most people's minds. The purpose of this paper is to answer this question. Standard actuarial methods make it possible to calculate what Social Security benefits will be for a person of any age. This article will present calculations for individuals at different ages and at different levels of earnings in 1983. The individual cases examined here make it possible for readers to see how Social Security works and to obtain an idea of their own treatment under the system.

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A detailed explanation of the methodology of this paper, the "prototype model" used to compute benefits and taxes, and the basic data set are available from the authors upon request.

[1] *1983 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds* (Washington, D.C.: Social Security Administration, 1983).

What an individual can expect to receive from Social Security is an especially interesting question this year because of the major Social Security legislation (Public Law 98-21) enacted on April 20, 1983. (This legislation will be alternately referred to as the 1983 Social Security Amendments or the new legislation.) Much of the discussion of Social Security's financial problems and proposed solutions before the 1983 Social Security Amendments was in aggregate dollar terms. This paper includes calculations of individual treatment under Social Security both before and after the new legislation and illustrates the effects of this legislation on different individuals in dollar terms.

The concept of what an individual can expect to receive from Social Security is an important one. The Social Security benefits that an individual can expect to receive have a dollar value and, as such, represent a form of wealth. More precisely, Social Security wealth is the actuarial present value of the Social Security benefits to which an individual is entitled as a retired or disabled worker. *Actuarial* means that the likelihood of surviving to retirement years or becoming disabled is taken into account. *Present value* refers to the conversion of future income, in this case future Social Security benefit payments, into current dollar values; the way this conversion is done is described in section II. Thus, Social Security wealth is the total amount that an individual can expect to receive in Social Security benefits, expressed in today's dollars. This paper presents the value of Social Security wealth for both single and married individuals, by age and earning levels.

To receive benefits, an individual must pay payroll taxes into the Social Security system. However, there is no direct link between the taxes an individual pays and the benefits he receives. Like benefits, payroll taxes have a total dollar value—expressed by the actuarial present value of the payroll taxes a worker pays during his working life. "Actuarial" and "present value" mean what they did for Social Security wealth—with two slight modifications. One modification is that "actuarial" refers to the fact that surviving to work or becoming disabled in the years before retirement is taken into account. The other modification is that past payroll taxes are brought up to their value in today's dollars by adding the interest that would accumulate from these taxes between the year they were paid and the present. The interest rate at which past taxes are brought forward is described in section II. The present value of payroll taxes ("actuarial" will be dropped for the sake of convenience and assumed in "present value") is the amount that an individual pays into the system in actual dollars, plus forgone interest.

The difference between Social Security wealth and the present value of payroll taxes gives the total gain or loss from Social Security over an individual's lifetime. This difference can be interpreted as the amount of money that Social Security would be giving or taking away today if it were done all at once rather than spread over a lifetime.

The value of Social Security wealth, the present value of payroll taxes, and the resulting net gain and loss for individual cases are presented both before and after the 1983 Social Security Amendments in sections III and IV respectively. The calculations are the product of a computer-simulation model developed by the authors. The model is flexible in a number of important ways. The base year that defines present value can be freely set; in this paper it is 1983. The model is flexible with respect to the ages, earning levels, and family situations that define individual cases. The particular ages and smooth earnings patterns used below were chosen to cover a wide range of individual cases, but the simulation model is in no way restricted to these examples. It should be obvious from an examination of the calculations before and after the 1983 Social Security Amendments that the model can be used to examine changes in the Social Security system. The model has been called the "prototype model" because of its ability to examine prototypical individual cases.

An explanation of how the Social Security system works and how future benefits and taxes are converted into current dollar values is discussed in the next section. The section will help clarify the calculation of Social Security benefits, Social Security wealth, and the present value of payroll taxes.

II. Explanation of Social Security Calculations

Social Security benefits are based on an individual's earnings in employment that is covered by the system during his working life.[2] The system counts earnings up to a maximum amount of $35,700 this year (1983). Above this amount, earnings are not taxed or counted in the benefit formula. The maximum earnings levels used in the tax and benefit calculations for past years are given in column 2 of table 1. The combined employer and employee payroll-tax rates for past years are given in column 3.

The benefit calculation begins by computing an individual's average annual covered earnings. Past earnings are first converted to their

[2]For a more detailed discussion of the Social Security benefit calculation, see National Commission on Social Security Reform, "Basic Method of Computing Social Security Benefits," memorandum no. 1, March 9, 1982.

TABLE 1

MAXIMUM TAXABLE EARNINGS UNDER SOCIAL SECURITY, PAYROLL-TAX RATES, INTEREST RATES, AND PROPORTIONAL WAGE INCREASES IN PAST YEARS

Year	Maximum Taxable Earnings	Combined Payroll-Tax Rate	Interest Rate	Proportional Wage Increase
1937	$3,000	2.000%	2.25%	14.173
1938	3,000	2.000	2.25	15.486
1939	3,000	2.000	2.25	14.545
1940	3,000	2.000	2.25	13.752
1941	3,000	2.000	2.25	12.501
1942	3,000	2.000	2.25	11.056
1943	3,000	2.000	2.25	9.491
1944	3,000	2.000	2.25	8.765
1945	3,000	2.000	2.25	8.993
1946	3,000	2.000	2.25	8.544
1947	3,000	2.000	2.25	7.342
1948	3,000	2.000	2.25	6.649
1949	3,000	2.000	2.25	6.493
1950	3,000	3.000	2.25	6.102
1951	3,600	3.000	2.36	5.416
1952	3,600	3.000	2.46	5.099
1953	3,600	3.000	2.85	4.829
1954	3,600	4.000	2.40	4.804
1955	4,200	4.000	2.82	4.592
1956*	4,200	4.000	3.18	4.292
1957	4,200	4.500	3.65	4.163

1958	$4,200	4.500%	3.32%	4.127
1959	4,800	5.000	4.33	3.932
1960	4,800	6.000	4.12	3.783
1961	4,800	6.000	3.88	3.710
1962	4,800	6.250	3.95	3.533
1963	4,800	7.250	4.00	3.448
1964	4,800	7.250	4.19	3.313
1965	4,800	7.250	4.28	3.254
1966	6,600	7.700	4.92	3.070
1967	6,600	7.800	5.07	2.908
1968	7,800	7.600	5.65	2.721
1969	7,800	8.400	6.67	2.572
1970	7,800	8.400	7.35	2.451
1971	7,800	9.200	6.16	2.333
1972	9,000	9.200	6.21	2.125
1973	10,800	9.700	6.84	2.000
1974	13,200	9.900	7.56	1.888
1975	14,100	9.900	7.99	1.756
1976	15,300	9.900	7.61	1.643
1977	16,500	9.900	7.42	1.550
1978	17,700	10.100	8.41	1.436
1979	22,900	10.160	9.44	1.321
1980	25,900	10.160	11.46	1.212
1981	29,700	10.700	13.91	1.101
1982	32,400	10.800	13.00	1.046
1983	35,700	10.800	11.40	1.000

*The Disability Insurance (DI) program was begun in 1956, and a portion of the payroll-tax rate was added and earmarked for the DI program.

value in current dollars. This is done by taking earnings in a particular year and increasing them by the same proportion that average covered wages increased in the population as a whole since that year. The proportional increases in wages from past years are given in column 5 of table 1. Using these proportions, past covered earnings can be updated to their value in terms of current covered wages. For example, using the value of 2.451 for 1970, earnings of $10,000 in 1970 would be updated to a value of $24,510 in 1983. Earnings updated in this way are said to be *wage-indexed.* The average of wage-indexed annual earnings, after excluding the five years of lowest earnings, is used as the base for calculating benefits. This average annual amount is divided by 12 to put it in monthly terms; it is called the *average indexed monthly earnings* and is abbreviated AIME. In the technical language of the Social Security system, AIME is an individual's benefit base.

A person's basic benefit (i.e., the benefit amount received by an individual without dependents) is called the primary insurance amount and is abbreviated PIA. The formula in 1983 for calculating the basic monthly benefit (PIA) from the benefit base (AIME) is:

90 percent of the first $254 of AIME, plus
32 percent of AIME over $254 through $1,528, plus
15 percent of AIME over $1,528.

The percentage rates (90, 32, and 15 percent) are referred to as the *bracket replacement rates* or simply called the *bracket rates.* The AIME amounts related to the brackets ($254 and $1,528) are called the *bend points* of the formula. The formula is explicitly tilted toward those with lower lifetime earnings, replacing a higher proportion of low earnings (90 percent) than of high earnings (15 percent).

Two basic objectives are incorporated in the Social Security formula. The first objective is to reallocate an individual's lifetime income from working years to retirement years to provide support for his own retirement. Computing benefits from an average of a worker's earnings reflects this objective. The present value of payroll taxes represents a measure of the reallocation of individual lifetime income achieved through the system. This reallocation will be referred to as the *individual equity* in the system. The second objective is to redistribute lifetime income between individuals to provide adequate retirement support and achieve other social-insurance objectives. The tilt in the Social Security benefit formula and the payment of dependents and survivors benefits reflect the explicit intent of the system to allocate benefits partly on the basis of need. A measure of the redistributive elements of the system is reflected by the difference between the present value of payroll taxes and Social Security

wealth. The redistributive elements of Social Security will be referred to as the *social adequacy* of the system.

Current law requires that the bend points in the PIA formula be increased by the same proportion that average wages grow in the economy. Thus, the bend points are wage-indexed, as are earnings in the calculation of AIME. Because the law specifies the benefit formula into the indefinite future, the benefit for a person of any age can be computed as long as a rate of growth of earnings is known.

Whether an individual pays only the employee portion of the payroll tax or pays the combined employer and employee portions is an important issue in the calculation of the present value of payroll taxes. This question was addressed by Robert J. Myers in his presentation of similar calculations to the National Commission on Social Security Reform:

> A major element in the analysis is whether only the employee tax rate should be considered, or whether the combined employer-employee tax should be the basis for comparison. Many individuals believe that the latter basis is the appropriate one, because many economists view that the employer tax is borne entirely by the employee through lower wages than would otherwise be paid. Others believe, however, that—at least, in part—the employer tax is passed on to consumers in general (who, in the aggregate, largely consists of employees and their families) in the form of higher prices; under these circumstances, it is not possible to state that each employee fully bears, in an indirect manner, the employer taxes on his or her wages, but rather it could be more or less so.[3]

The calculations presented to the National Commission on Social Security Reform included both the employer and employee portions of the payroll tax in the calculation of the present value of individual payroll taxes. We have adopted this approach for our calculations.

The present value of payroll taxes is calculated by adding to taxes the interest that would have accumulated from the year they were paid. An appropriate interest rate for this calculation is the rate at which funds can be safely invested. The exact specification of such an interest rate is not clear cut. We used the approach followed by the National Commission on Social Security Reform. This approach uses the yearly average interest rate on new special-issue investments of the Social Security trust funds for 1951 through 1982 and an assumed 2.25-percent rate for 1937 through 1950. These rates are shown in column 4 of table 1.

[3]National Commission on Social Security Reform, "Money's-Worth Comparison for Social Security Benefits," memorandum no. 45, August 12, 1982.

For the individual cases examined here, benefits are based in part on earnings in the future. This involves projecting an individual's future earnings. Our approach uses projections for wages and prices from the *1983 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds* (hereafter referred to as the *1983 Trustees Report*). This report, required by law, provides an annual statement of the income and disbursements of the Social Security system. It includes projections of future income and disbursements under four sets of economic assumptions. The assumptions range from "optimistic" (Alternative I), to "intermediate" (Alternatives II-A and II-B), to "pessimistic" (Alternative III). The intermediate II-B assumptions are considered to be the most realistic of the four sets of assumptions and are used in our calculations.[4] The projected inflation rate and rate of growth of real earnings in future years under Alternative II-B are given in columns 2 and 3 of table 2. Although we chose to use projections from the *Trustees Report* because the National Commission on Social Security Reform used them, it is worth noting that our computer-simulation model (the prototype model) is not restricted to this set of projections.

In our calculation of Social Security wealth, the benefit amounts that individuals can expect to receive in future years are converted to their value in 1983 dollars. The present value of a benefit payment in a future year is defined as the amount that would have to be invested today to yield that future payment. To calculate this amount, interest rates in future years have to be specified. Rates included in the *1983 Trustees Report* were used. Projected future interest rates under Alternative II-B are given in column 4 of table 2. Based on these rates, a benefit payment of $10,000 in the year 2003 has a present value of $2,992. In other words, $2,992 would have to be invested in 1983 to yield a one-time payment of $10,000 in 20 years, at the interest rates in table 2.

The calculation of the present value of future benefit payments does not depend as much on the actual level of the interest rate as it does on the difference between the interest rate and the inflation rate. The "real" interest rate is the important factor in calculating the

[4]The effect of using economic assumptions that differ from Alternative II-B can be examined with our prototype model. For example, if price inflation is assumed to be greater relative to real wage growth, individual returns from Social Security would decline. The prototype model also allows us to depart from the assumption that rates of growth are constant after 1995 (see table 2) and incorporate business cycles in the economic forecast instead. The effect of business cycles on the calculations depends on the pattern of projected cycles and cannot be easily summarized.

TABLE 2

PROJECTED FUTURE INFLATION RATES, REAL EARNINGS GROWTH RATES, INTEREST RATES, AND PAYROLL-TAX RATES

Year	Inflation Rate	Real Earnings Growth Rate	Interest Rate	Old Law: Payroll-Tax Rate	Current Law: Payroll-Tax Rate
1983	3.1	1.5	11.4	10.80	10.80
1984	4.4	.2	9.3	10.80	11.40
1985	5.3	.2	8.0	11.40	11.40
1986	4.8	.8	7.1	11.40	11.40
1987	4.4	1.3	6.8	11.40	11.40
1988	4.1	1.3	6.6	11.40	12.12
1989	4.0	1.4	6.5	11.40	12.12
1990	4.0	1.6	6.4	12.40	12.40
1991	4.0	1.7	6.4	12.40	12.40
1992	4.0	1.6	6.3	12.40	12.40
1993	4.0	1.5	6.2	12.40	12.40
1994	4.0	1.5	6.2	12.40	12.40
1995	4.0	1.5	6.1	12.40	12.40
1996	4.0	1.5	6.1	12.40	12.40
1997	4.0	1.5	6.1	12.40	12.40
1998	4.0	1.5	6.1	12.40	12.40
1999	4.0	1.5	6.1	12.40	12.40
2000*	4.0	1.5	6.1	12.40	12.40

*Growth rates and payroll-tax rates remain at their year-2000 levels in subsequent years.

present value of benefits. This can best be illustrated with an example. Consider an individual age 25 in 1983 whose earnings in 1983 were $20,000 and whose future earnings are expected to grow according to the rates of inflation and real earnings growth projected in the *Trustees Report*. This individual's benefit in 2023, the year he turns age 65, would be $60,288. The present value of the benefit, computed using the interest rates in table 2, is $5,359. Recomputing this example at inflation rates and interest rates that are three percentage points higher than in table 2 yields a benefit level in 2023 that has a present value of $5,229. At inflation rates and interest rates that are three percentage points lower than in table 2, the benefit has a present value of $5,385. This example illustrates that the inflation and interest rates affect the calculation of present values very little, as long as the difference between the two rates remains about the same.

In summarizing, we have calculated benefits and payroll taxes for individual cases according to the law in 1983, both before and after the 1983 Social Security Amendments. Past payroll taxes are converted into 1983 dollars by adding the amount of interest that would accrue on these taxes between the time they were paid and the present. The rates of inflation and real earnings growth used in the *1983 Trustees Report* are used to project future earnings. Because Social Security law specifies how the system is to work into the indefinite future, an individual's future payroll taxes and benefits can be computed. Future payroll taxes and benefits are converted into dollars of present value for 1983 using the interest rates projected in the *1983 Trustees Report*. This information allows us to calculate an individual's expected Social Security benefits and taxes in terms of today's dollars.

III. Individual Gains and Losses before the 1983 Social Security Amendments

The concepts of Social Security wealth and the present value of payroll taxes have been introduced in section I and were described in more detail in section II. This section is devoted to a presentation of these calculations under the law before the 1983 Social Security Amendments. Table 3 presents calculations for individuals in the following family situations: a one-earner married couple in which either the husband works or the wife works; a two-earner married couple in which both husband and wife earn an equal amount; and a single individual, who may be either male or female. The age of the earners in each of these family situations is set at 40 years (calculations at ages 25 and 55 are presented later). All family types have

TABLE 3

GAINS AND LOSSES FOR INDIVIDUALS AGE 40 UNDER OLD LAW
(Expressed in Present-Value Dollars in 1983)[a]

Total Earnings in 1983[b]	Family Situation				
	Husband Works	Wife Works	Both Spouses Work	Unmarried Male	Unmarried Female
$10,000					
SSW	77,656	81,059	62,381	37,508	52,549
PVTAX	42,858	43,909	43,384	42,858	43,909
Gain/Loss	34,798	37,150	18,997	−5,350	8,640
$15,000					
SSW	101,889	106,363	76,558	49,220	68,961
PVTAX	64,287	65,864	65,075	64,287	65,864
Gain/Loss	37,602	40,500	11,482	−15,068	3,097
$20,000					
SSW	125,967	131,506	90,745	60,855	85,265
PVTAX	84,919	87,021	86,767	84,919	87,021
Gain/Loss	41,048	44,485	3,978	−24,064	−1,755
$25,000					
SSW	136,783	142,889	104,917	66,135	92,700
PVTAX	102,169	104,797	108,459	102,169	104,797
Gain/Loss	34,614	38,092	−3,542	−36,034	−12,097
$30,000					
SSW	145,586	152,279	119,084	70,510	98,912
PVTAX	116,279	119,431	130,151	116,279	119,431
Gain/Loss	29,308	32,848	−11,067	−45,769	−20,520
$35,700					
SSW	154,075	161,379	135,240	74,752	104,954
PVTAX	129,777	133,491	154,512	129,777	133,491
Gain/Loss	24,298	27,888	−19,269	−55,025	−28,537

[a]Some of the gain/loss calculations are off by one unit due to rounding.
[b]SSW = Social Security wealth; PVTAX = present value of payroll taxes; Gain/Loss = net gain or loss.

the same total 1983 earnings given in the indicated rows of the table. Table 3 provides a clear picture of the redistribution of lifetime income in today's dollars between individuals and married couples at different earnings levels.

To see the implications of the tilt in the Social Security benefit formula on a lifetime basis, consider the results for single individuals. The table shows a sharp decline in net gains from Social Security as

earnings increase. Single men incur losses at all earnings levels—losses that rise as earnings increase. At the $10,000 earnings level, Social Security wealth for a 40-year-old single male is $37,508, and the present value of the payroll taxes paid over his working life is $42,858, yielding a net loss in lifetime income of $5,350. The same male at the maximum taxable earnings level of $35,700 has Social Security wealth of $74,752 and a present value of payroll taxes of $129,777, yielding a loss in lifetime income of $55,025. For a 40-year-old single woman there is a gain in lifetime income of $8,640 at the $10,000 earnings level and a loss of $28,537 in lifetime income at the maximum taxable earnings level. The redistribution of lifetime income between individuals in the same family situation but at different earnings levels provides a lifetime perspective on the effect of the tilt in the benefit formula.

Table 3 also shows that women fare much better than men in their lifetime treatment under Social Security. At the $20,000 earnings level, a 40-year-old single male can expect to lose $24,064 in lifetime income, while a 40-year-old single female can expect to lose only $1,755 (with a Social Security wealth of $85,265 she is essentially breaking even).

The reason for this disparity between men and women is that women have higher survival rates than men. The survival rate for reaching age 65 for 40-year-old women is 86 percent, compared to 74 percent for 40-year-old men. On average, women can also expect to collect benefits about 4.5 years longer than men. Differences in survival rates are also responsible for the higher present value of payroll taxes for women than men at the same earnings levels (i.e., women have a higher chance of surviving to pay payroll taxes in the future). In general, identified groups of workers that live longer obtain higher gains in lifetime income from Social Security.

Table 3 illustrates the variation in expected benefits between single individuals and one-earner couples. Although a single man earning $20,000 at age 40 pays exactly the same taxes as a one-earner couple (when the husband works), he receives $65,112 less in total benefits—the equivalent of over 3.25 years of work. Because of differences in survival rates, single women fare somewhat better in relation to one-earner couples than single men do. Single women age 40 earning $20,000 receive $46,241 less in total Social Security benefits than a one-earner couple in which the wife works, which amounts to approximately 2.25 years of earnings.

One-earner couples also fare well in relation to two-earner couples. A one-earner couple in which the husband (age 40) earns $20,000 can currently expect a gain of $41,408 from Social Security, which is

$37,070 more than the gain for a two-earner couple (both age 40) in which each spouse earns $10,000. By any reasonable standard, the $20,000 one-earner couple is richer than the $20,000 two-earner couple, since the nonworking spouse in the one-earner couple could also work and earn income. Presumably the nonworking spouse provides household services that exceed in value the compensation from market work. Yet, in the above example, the current system provides the one-earner couple with $37,070 extra. This is equivalent to approximately two years of earnings. In other words, the current structure of Social Security requires the less-well-off two-earner couple to work an additional two years to end up with the same lifetime income that the one-earner couple receives.

It is also possible for two families to pay in different amounts and receive identical benefits. This is a consequence of the way the system awards benefits to dependents and survivors. Whether a wife works or not, as a dependent spouse she is entitled to receive a benefit based on half of her husband's own basic benefit, i.e., half of his PIA. Consequently, if her earnings entitled her to a benefit that is less than half of her husband's, she is entitled to no more than if she had not worked at all. If her benefit is more than half of her husband's, she gains only the difference between her benefit and half of his. Even if this is the case, she will switch to receiving her husband's benefit in the event of his death because as a surviving spouse she is entitled, whether she works or not, to her husband's full benefit. Thus, under Social Security, working does not entitle a wife whose earnings are less than her husband's to much more than if she never worked. The same holds true for a husband whose earnings are less than his wife's.

Benefits to dependents and survivor spouses are only part of an array of so-called ancillary benefits awarded by Social Security. These ancillary benefits are "add-ons" to a worker's own benefit (i.e., his PIA) and represent a departure from tying his benefits to the contributions he made into the system. The point here is not to suggest the elimination of such benefits. These benefits reflect a fundamental conflict between having benefits depend strictly on the degree to which a worker supported the system through payroll taxes (individual equity) and providing insurance to his family (social adequacy).

The calculations in table 3 for 40-year-olds were also done for 25- and 55-year-olds. The results are presented in tables 4 and 5. The pattern of redistribution shown for 40-year-olds (between individuals at different earnings levels, men and women, single individuals and married couples, and one-earner and two-earner couples) is repeated with these age groups. The tables present basically the same pattern

TABLE 4

GAINS AND LOSSES FOR INDIVIDUALS AGE 25 UNDER OLD LAW
(Expressed in Present-Value Dollars in 1983)[a]

Total Earnings in 1983[b]	Family Situation				
	Husband Works	Wife Works	Both Spouses Work	Unmarried Male	Unmarried Female
$10,000					
SSW	72,370	77,270	61,126	33,890	49,782
PVTAX	40,077	41,536	40,807	40,077	41,536
Gain/Loss	32,293	35,734	20,319	−6,187	8,246
$15,000					
SSW	94,956	101,392	75,009	44,475	65,331
PVTAX	60,116	62,304	61,210	60,116	62,304
Gain/Loss	34,840	39,088	13,799	−15,641	3,026
$20,000					
SSW	117,328	125,341	88,895	54,985	80,773
PVTAX	80,154	83,073	81,613	80,154	83,073
Gain/Loss	37,174	42,268	7,281	−25,169	−2,299
$25,000					
SSW	128,107	136,808	102,780	59,996	88,129
PVTAX	100,193	103,841	102,017	100,193	103,841
Gain/Loss	27,915	32,967	763	−40,197	−15,712
$30,000					
SSW	138,693	148,113	116,655	64,956	95,416
PVTAX	120,231	124,609	122,420	120,231	124,609
Gain/Loss	18,462	23,504	−5,765	−55,275	−29,193
$35,700					
SSW	149,934	160,170	132,359	70,249	103,204
PVTAX	140,784	145,936	145,680	140,784	145,936
Gain/Loss	9,150	14,234	−13,321	−70,535	−42,732

[a]Some of the gain/loss calculations are off by one unit due to rounding.
[b]SSW = Social Security wealth; PVTAX = present value of payroll taxes; Gain/Loss = net gain or loss.

of gains and losses within particular age groups, i.e., the same pattern of *intra*generational redistribution.

Comparisons among tables 3, 4, and 5 illustrate some important differences in the treatment of different generations by Social Security—the so-called *inter*generational redistribution of the system. Overall, there is redistribution of lifetime income from young to old. This is illustrated for any particular family type. A single male, age

TABLE 5

GAINS AND LOSSES FOR INDIVIDUALS AGE 55 UNDER OLD LAW
(Expressed in Present-Value Dollars in 1983)[a]

Total Earnings in 1983[b]	Family Situation				
	Husband Works	Wife Works	Both Spouses Work	Unmarried Male	Unmarried Female
$10,000					
SSW	88,168	89,053	69,301	43,063	57,761
PVTAX	37,730	38,164	37,974	37,730	38,164
Gain/Loss	50,438	50,889	31,354	5,334	19,597
$15,000					
SSW	115,711	116,886	85,062	56,525	75,822
PVTAX	56,595	57,245	56,920	56,595	57,245
Gain/Loss	59,117	59,640	28,142	−69	18,577
$20,000					
SSW	140,411	141,966	100,824	68,683	92,178
PVTAX	72,695	73,563	75,893	72,695	73,563
Gain/Loss	67,716	68,403	24,931	−4,013	18,615
$25,000					
SSW	148,828	150,478	116,586	72,798	97,703
PVTAX	83,139	84,223	94,867	83,139	84,223
Gain/Loss	65,689	66,255	21,719	−10,341	13,480
$30,000					
SSW	153,760	155,615	132,347	75,312	101,136
PVTAX	90,441	91,742	113,840	90,441	91,742
Gain/Loss	63,319	63,873	18,507	−15,128	9,394
$35,700					
SSW	158,060	160,135	150,248	77,532	104,181
PVTAX	96,662	98,197	134,268	96,662	98,197
Gain/Loss	61,398	61,937	15,980	−19,130	5,984

[a]Some of the gain/loss calculations are off by one unit due to rounding.
[b]SSW = *Social Security wealth*; PVTAX = present value of payroll taxes; Gain/Loss = net gain or loss.

25, earning $20,000 in 1983, can expect to lose $25,169. A single male age 40 at the same earnings level faces a loss of $24,064. A 55-year-old single male earning $20,000 can expect a loss of $4,013. If these males married and the wife had no earnings, they would all gain. The gains would be $37,174 at age 25, $41,048 at age 40, and $67,716 at age 55. The pattern of smaller gains or greater losses for younger generations is consistent for all types of families.

Although the results illustrate different treatment for different generations, they do not mean that as individuals get older their treatment under Social Security improves. A 25-year-old who is losing income today will be losing the same amount in 1983 dollars when he is 40 or 55.

Differences in the treatment of generations by Social Security are consistent with historical development of the system. The growth of the system has been documented and discussed in numerous articles and books on the subject,[5] so the discussion here will be brief. The redistribution of income to the elderly was greatest, in terms of total benefits compared to total taxes, when the system was initiated. Benefits were paid immediately to individuals who did not pay into the system. The economic environment of the 1930s had a great impact on this provision of the program. The Social Security system was conceived and established during the time of the Great Depression. The economic hardships brought upon the elderly who saw their lifetime savings severely reduced and who could not reasonably have prepared for such an event gave impetus to the establishment of a Social Security system that paid benefits immediately. The system represents, in part, a transfer from younger generations to the elderly harmed by the Great Depression—a transfer that conferred large gains in lifetime income on its initial beneficiaries.

The Great Depression imposed economic losses not only on the elderly of the time, but also on nearly the entire working and retired population. Thus, the payment of net gains of lifetime income through Social Security to people reaching retirement as late as 1983 can be justified on the grounds that they also suffered from the Great Depression.

Although the Great Depression had some influence on the initial development of the system, in the 1950s, 1960s, and 1970s the system responded to the economic and political environment of those times.

[5]For example, see Martha Derthick, *Policymaking for Social Security* (Washington, D.C.: Brookings Institution, 1979); Robert J. Myers, *Social Security*, 2d ed. (Homewood, Ill.: Richard D. Irwin, Inc., 1981); Sylvester J. Schieber, *Social Security: Perspectives on Preserving the System* (Washington, D.C.: Employee Benefit Research Institute, 1982).

The effect of Social Security on individual behavior and the economy has been the subject of considerable research. A review of the relationship between Social Security and savings is provided by Mordecai Kurz, "Analyzing Social Security and Intergenerational Capital Formation and Transmission," paper prepared for the Center for Economic Policy Research Conference on Social Security, Stanford University, May 1983. At the same conference, Michael Hurd reviewed the relationship between Social Security and retirement behavior in his paper, "The Effect of Social Security on Retirement: Results and Issues."

Retirees during these decades were awarded large gains in lifetime income from Social Security because the system and the economy were growing. That growth put surplus revenue into the Social Security trust funds. With those surpluses, it was easy for Congress to increase benefit levels through more generous benefit formulas and more ancillary benefits (i.e., more add-ons based on a worker's family situation).

Today the system has reached maturity—it covers nearly the entire U.S. population. Workers, even those near retirement, have paid into the system during an entire working life. The result of having more years of a person's working life covered by the system at higher payroll-tax rates is that the gains from the system are less for younger generations. Because the system now covers workers' entire careers at substantial rates of payroll taxation, there has been a significant shift in people's view of Social Security. People regard Social Security more as an investment they make over their entire life than as a system of transfers to the elderly, as the system was conceived to be. The question of individual gains and losses addressed by our paper arises naturally from the maturation of the Social Security system.

IV. Individual Gains and Losses under the 1983 Social Security Amendments

The results presented in the previous section attach dollar amounts to Social Security's two basic objectives, individual equity and social adequacy. The results express in dollar terms the distributional choices that underlay the structure of Social Security before the new legislation went into effect. Those figures also provide a backdrop for examining the new legislation. Taken together, the calculations in the last section and those presented in this section provide a quantitative picture of the changes in the distributional composition of Social Security. The calculations quantify the distributional choices made in the construction of this year's legislation.

The new legislation contains many specific provisions, some of which have only minor effects on our calculations. We have focused our analysis on the major provisions that have general applicability. The provisions we have added in this section to the calculations of section III are: (1) the increase in the payroll-tax rate; (2) the six-month delay in the cost-of-living adjustment of benefit payments; (3) the increase in the retirement age; and (4) the taxation of Social Security benefits.

1. Increase Payroll Taxes

Payroll-tax revenue is raised by advancing the payroll-tax increases previously scheduled for 1985 to 1984 and advancing part of the

scheduled 1990 increase to 1988. The combined tax rates for employers and employees under the previous law and under the new law are:

Year	*Previous Schedule*	*New Schedule*
1984	10.80%	11.40%
1985	11.40	11.40
1986–87	11.40	11.40
1988–89	11.40	12.12
1990 and after	12.40	12.40

As has been the case throughout this paper and its calculations, these payroll-tax rates refer to the OASDI portion of Social Security.

2. *Delay the Cost-of-Living Adjustment (COLA) of Benefit Payments*

The July 1983 COLA scheduled under the old law will be delayed to January 1984, and annual COLAs thereafter will take place each January. The July 1983 COLA would have been 3.6 percent, which is equal to the increase in the Consumer Price Index (CPI) from the first quarter of 1982 to the first quarter of 1983. This 3.6-percent increase will instead be applied to benefit payments in January 1984. The January 1985 COLA will equal the percentage increase in the CPI from the third quarter of 1983 to the third quarter of 1984. Subsequent January COLAs will be similarly based on the previous two third-quarter CPIs.

The six-month COLA delay affects both current and future retirees. Before the new legislation, prospective retirees could expect a COLA in the first year of retirement. This occurred because the July COLA was applied whether an individual retired at the beginning or at the end of the year. For example, consider two individuals who plan to retire at age 65; one was born in January and the other was born in December. The January retiree would start to receive benefits based on his PIA computed in January, and under the old law he would receive a COLA in July. The PIA of the December retiree would be computed in exactly the same way as that of the January retiree; if their AIMEs were the same, their PIAs would be equal. The COLA of the previous July would be applied to the December retiree's PIA, making his benefit payment the same as the January retiree's. In this way all cohorts (i.e., individuals born in the same year and retiring in the same year) were treated the same in terms of the calculation of their monthly benefit amounts, regardless of when in the year their birthdays fell.

By moving the COLA from July to January, the new legislation makes future retirees wait longer for their first and subsequent COLAs. As a result, a future retiree's benefit payments in any given year will be lower than they would have been under the old law. The total effect of this will be seen in lower values of Social Security wealth.

3. Raise the Retirement Age

The retirement age (more precisely, the age at which individuals are eligible for full retirement benefits) is raised from 65 to 67 in two steps: (1) from 65 to 66 by two months per year for people who reach age 62 in the years 2000–2005; (2) from 66 to 67 by two months per year for people reaching age 62 in the years 2017–2022. Reduced benefits remain available at age 62, but the reduction factor is increased from 20 to 25 percent when retirement age is 66 and to 30 percent when retirement age is 67.

4. Tax Social Security Benefits

The provision for taxing Social Security benefits begins in 1984. It includes in taxable income up to one-half of Social Security benefits if the taxpayer's income exceeds a threshold of $25,000 for a single taxpayer and $32,000 for married taxpayers. The income associated with these thresholds is adjusted gross income (AGI), plus nontaxable interest income, plus one-half of Social Security benefits. If the taxpayer's income exceeds the threshold, then the amount of Social Security benefits added to taxable income equals the lesser of either (1) one-half of the excess of the taxpayer's income that is over the threshold or (2) one-half of Social Security benefits. This amount multiplied by the taxpayer's marginal tax rate is the additional income-tax revenue that is aggregated to compute the amount of general revenue that will be transferred to the Social Security trust funds.

Taxation of Social Security benefits introduces the estimation of the income of beneficiaries into our calculations. There are various ways to impute income. We chose to assume that retirement income other than Social Security equals 15 percent of earnings in the last year before retirement. This is a conservative assumption, producing a low estimate of the additional income tax an individual will have to pay due to the taxation of Social Security benefits.[6]

Tables 6, 7, and 8 present the calculations of Social Security wealth and present value of payroll taxes after the 1983 amendments for

[6]Using a higher estimate of retirement income as a percentage of preretirement income would increase the additional taxes that individuals pay as a result of the taxation of Social Security benefits.

TABLE 6

GAINS AND LOSSES FOR INDIVIDUALS AGE 40 UNDER NEW LAW
(Expressed in Present-Value Dollars in 1983)[a]

Total Earnings in 1983[b]	Family Situation				
	Husband Works	Wife Works	Both Spouses Work	Unmarried Male	Unmarried Female
$10,000					
SSW	72,447	75,399	57,633	34,685	48,468
PVTAX	43,042	44,094	43,568	43,042	44,094
Gain/Loss	29,405	31,305	14,065	−8,357	4,374
$15,000					
SSW	95,053	98,936	70,730	45,515	63,605
PVTAX	64,563	66,141	65,352	64,563	66,141
Gain/Loss	30,490	32,794	5,378	−19,048	−2,537
$20,000					
SSW	117,515	122,322	83,837	56,274	78,643
PVTAX	85,286	87,391	87,136	85,286	87,391
Gain/Loss	32,229	34,931	−3,299	−29,912	−8,748
$25,000					
SSW	127,601	132,905	96,929	61,157	85,500
PVTAX	102,629	105,260	108,920	102,629	105,260
Gain/Loss	24,972	27,645	−11,991	−41,472	−19,760
$30,000					
SSW	135,750	141,545	110,016	65,028	91,008
PVTAX	116,830	119,987	130,704	116,830	119,987
Gain/Loss	18,920	21,558	−20,688	−51,802	−28,979
$35,700					
SSW	143,479	149,746	124,943	68,602	96,101
PVTAX	130,430	134,150	155,168	130,430	134,150
Gain/Loss	13,049	15,597	−30,226	−61,828	−38,049

[a]Some of the gain/loss calculations are off by one unit due to rounding.
[b]SSW = Social Security wealth; PVTAX = present value of payroll taxes; Gain/Loss = net gain or loss.

individuals aged 40, 25, and 55. The same patterns of lifetime income reallocation and redistribution that were manifest in tables 3–5 are present in tables 6–8 as well. The magnitudes of the values differ. Rather than describing the basic patterns of reallocation and redistribution again, this section will focus on the changes that occurred because of the provisions in the new legislation.

TABLE 7

GAINS AND LOSSES FOR INDIVIDUALS AGE 25 UNDER NEW LAW
(Expressed in Present-Value Dollars in 1983)[a]

Total Earnings in 1983[b]	Family Situation				
	Husband Works	Wife Works	Both Spouses Work	Unmarried Male	Unmarried Female
$10,000					
SSW	66,383	70,323	55,304	30,483	44,580
PVTAX	40,120	41,724	40,993	40,263	41,724
Gain/Loss	26,120	28,600	14,311	−9,780	2,857
$15,000					
SSW	87,099	92,274	67,863	40,002	58,503
PVTAX	60,395	62,585	61,490	60,395	62,585
Gain/Loss	26,704	29,689	6,373	−20,393	−4,082
$20,000					
SSW	107,446	113,816	80,424	49,041	71,784
PVTAX	80,526	83,447	81,987	80,526	83,447
Gain/Loss	26,920	30,369	−1,562	−31,486	−11,663
$25,000					
SSW	116,909	123,688	92,985	53,023	77,624
PVTAX	100,658	104,309	102,483	100,658	104,309
Gain/Loss	16,251	19,379	−9,498	−47,635	−26,685
$30,000					
SSW	125,936	133,149	105,537	57,000	83,436
PVTAX	120,790	125,171	122,980	120,790	125,171
Gain/Loss	5,147	7,978	−17,443	−63,790	−41,735
$35,700					
SSW	135,434	143,162	119,338	61,271	89,682
PVTAX	141,446	146,602	146,346	141,446	146,602
Gain/Loss	−6,012	−3,440	−27,008	−80,175	−56,920

[a]Some of the gain/loss calculations are off by one unit due to rounding.
[b]SSW = Social Security wealth; PVTAX = present value of payroll taxes; Gain/Loss = net gain or loss.

Tables 6, 7, and 8 show a small increase in the present value of payroll taxes for all ages. The largest increase is approximately $660, for individuals earning the maximum taxable amount of $35,700. At other earnings levels, the increases are less. In all cases, the payroll-tax increase is a small percentage of either the present value of payroll taxes or Social Security wealth. This is to be expected, since the

TABLE 8

GAINS AND LOSSES FOR INDIVIDUALS AGE 55 UNDER NEW LAW
(Expressed in Present-Value Dollars in 1983)[a]

	Family Situation				
Total Earnings in 1983[b]	Husband Works	Wife Works	Both Spouses Work	Unmarried Male	Unmarried Female
$10,000					
SSW	84,971	86,663	67,752	42,067	56,506
PVTAX	37,899	38,339	38,119	37,899	38,339
Gain/Loss	47,072	48,324	29,633	4,168	18,166
$15,000					
SSW	111,518	113,750	83,162	55,218	74,174
PVTAX	56,848	57,509	57,179	56,848	57,509
Gain/Loss	54,669	56,241	25,983	−1,631	16,665
$20,000					
SSW	135,464	138,169	98,572	67,098	90,178
PVTAX	73,034	73,915	76,238	73,034	73,915
Gain/Loss	62,314	64,255	22,334	−5,936	16,263
$25,000					
SSW	143,464	146,455	113,982	71,118	95,584
PVTAX	83,562	84,663	95,298	83,562	84,663
Gain/Loss	59,902	61,793	18,684	−12,444	10,921
$30,000					
SSW	148,249	151,469	129,392	73,580	98,946
PVTAX	90,948	92,269	114,357	90,948	92,269
Gain/Loss	57,300	59,200	15,035	−17,368	6,677
$35,700					
SSW	152,430	155,884	146,894	75,755	101,930
PVTAX	97,264	98,823	134,884	97,264	98,823
Gain/Loss	55,166	57,062	12,010	−21,509	3,107

[a]Some of the gain/loss calculations are off by one unit due to rounding.
[b]SSW = Social Security wealth; PVTAX = present value of payroll taxes; Gain/Loss = net gain or loss.

increases in the payroll-tax rates in 1984 and 1988–89 are a fraction of a percent.

A useful way to isolate the impacts of the other provisions in the 1983 amendments is to examine the changes in Social Security wealth for people who are now age 55 (in 1983). Individuals who are that age will not be affected by the increase in retirement age. Their benefit levels and other retirement income, particularly at low earn-

ings levels, are not likely to trigger taxation of their Social Security benefits. Changes in Social Security wealth for 55-year-old low earners largely reflect the six-month delay of the COLA. At the $15,000 earnings level, Social Security wealth decreases by approximately $1,500 for single individuals, $2,000 for two-earner couples, and $4,000 for one-earner couples. At low earnings levels for the other age groups, the decrease in Social Security wealth includes the effects of raising the retirement age and taxing benefits.

The increase in retirement age from age 65 to 66 over the years 2000–2005 will be fully implemented when today's 40-year-olds retire. Some understanding of the magnitude of this change can be obtained by looking at changes in Social Security wealth for 40-year-olds in relation to 55-year-olds at low earnings levels. Again, the reason for looking at low earnings levels is to exclude or minimize the effect of taxing benefits. At the $15,000 earnings level, Social Security wealth declines by $3,000 to $5,000 for single individuals, by approximately $6,000 for two-earner couples, and by about $7,000 for one-earner couples. These decreases are more than twice those for 55-year-olds with the same earnings and family situations. Thus, the magnitude of the effect of raising the retirement age by one year for 40-year-olds is as large as the effect of the COLA delay. These results, based as they are on total present-value dollars, show the reduction in total benefit payments caused by the increase in retirement age.

The results for young individuals show the growing impact of the taxation of Social Security benefits. The tax burden is a function of age because Social Security benefits are indexed to the price level, and the income thresholds for taxing benefits are not. Eventually the growth in prices and the concomitant growth in Social Security benefits and other retirement income will combine to push individuals over the thresholds. This is more likely to happen to younger individuals and in greater dollar magnitudes.

A way to focus at least partially on the impact of taxing benefits is to examine what happens at the maximum level of taxable earnings. For 40-year-olds the decrease in Social Security wealth at $35,700 is more than $10,000 for two-earner couples and $10,000 to $12,000 for one-earner couples. For 25-year-olds these decreases are approximately $13,000 and $15,000 to $17,000 respectively. An important implication to draw from the greater impact of benefit taxation on younger generations is the expansion of this taxation as a source of general-revenue financing for Social Security.

In summary, the 1983 Social Security Amendments decrease lifetime income for younger generations. While 55-year-olds are affected

only by the six-month delay in the COLA, 25-year-olds are affected not only by this delay but also by the two-year increase in retirement age and the taxation of Social Security benefits. Nonindexation of the thresholds in the taxation scheme will impose a growing burden on younger generations due to Social Security benefit taxation. As mentioned in the last section, when Social Security was established and as it grew in the early decades, large gains were conferred on beneficiaries. As the system reaches maturity and continues into the future, the treatment of younger generations will have to be less generous to amortize the start-up gains of the system.

V. Summary and Conclusion

We were motivated by a question that is important to virtually everyone: What can an individual expect to receive from Social Security? To answer this question, the concepts of Social Security wealth and the present value of payroll taxes were explained and their values were calculated for different individual cases. The results illustrate the amount individuals can expect to pay into the system and how much they can expect to receive from the system. The different examples indicate the amount of intragenerational and intergenerational redistribution taking place through the system. The results before and after the 1983 amendments document the impact of the legislation on different individuals in dollar terms.

Intragenerational redistribution can be summarized as follows.

- *Between individuals at different earnings levels.* Under the new law, there is a gain in lifetime income of $5,378 for two-earner couples (both age 40) at the $15,000 earnings level and a loss of $11,991 at the $25,000 earnings level.
- *Between men and women.* Under the new law, a 55-year-old single woman at the $25,000 earnings level can expect a $10,921 gain in lifetime income, while a 55-year-old single man at the same earnings level can expect to lose $12,444 in lifetime income.
- *Between single individuals and married couples.* Under the new law, a 40-year-old man at the $20,000 earnings level can expect to lose $29,912 if single but gain $32,229 if married to a nonworking woman of the same age. A single 40-year-old woman at the $20,000 earnings level would lose $8,748 but would gain $34,931 if she were married to a nonworking husband of the same age.
- *Between one-earner and two-earner couples.* Under the new law, a two-earner couple (both age 40) earning $25,000 split evenly between husband and wife can expect a loss of $11,991

in lifetime income, while a one-earner couple (both age 40) can expect to gain approximately $25,000 whether it is the husband or the wife who works.

Under the old law, Social Security redistributed lifetime income from young to old. The new law continues this intergenerational redistribution of income. All generations sustain some loss in lifetime income as a result of the new law, with the decreases being proportionately greater for younger individuals.

The specific effects of the new legislation are the following.

- The increase in payroll taxes for all generations is a very small fraction of the total present value of payroll taxes they pay into the system.
- The delay in the cost-of-living adjustment of benefit payments affects current and future retirees. Before the new legislation, a future retiree could expect a COLA in the first year of retirement because it occurred in July. As a result of the new legislation, all new retirees in a particular year (starting with 1983) will have to wait until January of the following year for their first COLA. All subsequent COLAs are equally delayed. Consequently, benefit payments in 1983 and in any future year, for either current or future retirees, will be lower than they would have been under the old law.
- The increase in the retirement age reduces the total benefits paid to younger generations. The results in section IV were used to give some idea of how the increase in retirement age from 65 to 66 would affect total benefits paid to 40-year-olds. The effect of the full increase to age 67 was harder to isolate for 25-year-olds. (However, it is possible to simulate the effect of this change alone by using the prototype model.)
- The taxation of Social Security benefits has a growing impact on younger individuals. The reason for this is that the thresholds in the taxation scheme are not indexed for price changes. They stay at their nominal levels of $25,000 for a single taxpayer and $32,000 for married taxpayers. As Social Security benefits and other retirement income grow over time, more individuals will be pushed over the threshold and have their benefits taxed. The younger an individual is, the more likely he is to pay tax on his benefits and the larger the tax will be.

An important result of the 1983 amendments is that benefit taxation will expand as a source of general revenues for Social Security. The fact that younger generations will pay greater taxes on their Social

Security benefits is not just a technical feature of the law. It is inevitable that today's young will have to bear most of the burden of achieving long-range financial solvency in Social Security. The baby boom which, because of its great numbers, is able to support the gains conferred on today's retirees cannot expect anywhere near similar gains when it retires, again because of its numbers. The gains conferred on today's retirees are the result of a Social Security system, population, and economy that were expanding and growing more rapidly in the past than can be expected in the future. The 1983 Social Security Amendments mark the beginning of the process of amortizing the start-up gains from Social Security by reducing the gains to younger generations.