

## 26. GENERATIONAL ACCOUNTS PRESENTATION

Government deficits and the composition of government receipts and expenditures affect the distribution of income and wealth among different generations. Generational accounting is a new method for comparing the fiscal treatment of different generations.<sup>1</sup> It is still being developed, and a number of the assumptions used to estimate the accounts are controversial. This chapter explains the concept and presents some illustrative results, which should encourage further development of generational accounting and other analyses of the intergenerational effects of the budget.

- Future generations are estimated to pay 79 percent more in taxes, net of social security and other transfers they receive, than the generation of people who have just been born. This result is the combined effect of Federal, State, and local government budgets, not the Federal budget alone.
- The Omnibus Budget Reconciliation Act of 1990 (OBRA) significantly reduced the imbalance between generations. If OBRA had not been enacted, future generations would be estimated to pay an additional 18 percent more in taxes, net of the transfers they receive, than the generation of people just born.
- The effect of OBRA depends crucially on whether it permanently affects budget outlays and receipts, as the above comparison assumes. If taxes and expenditures return to their previous path after 1995, future generations would be estimated to pay an additional 14 percent more in taxes net of transfers than the generation of people just born—almost as much as if OBRA had never been enacted.
- Returning to pay-as-you-go finance of social security would significantly increase the fiscal burden on children, people just born, and future generations compared to those who are now adults and earning income.
- A large part of the heavy net tax payment by future generations, compared to those just born, is because medicare and medicaid transfers are projected to grow faster than the economy well beyond the turn of the century. Suppose, instead, that this health care spending was stabilized as a percentage of GNP after the year 2000 (except for the effects of demographic change). The payment of taxes (net of transfers) by future generations, compared to those just born, would fall from 79 percent to 41 percent.

<sup>1</sup>Generational accounting was developed by Alan J. Auerbach, Jagadeesh Gokhale, and Laurence J. Kotlikoff. See Auerbach, Gokhale, and Kotlikoff, "Generational Accounts: A Meaningful Alternative to Deficit Accounting," in David Bradford, ed., *Tax Policy and the Economy*, vol. 5 (MIT Press for the National Bureau of Economic Research, 1991), pp. 55-110, and Laurence J. Kotlikoff, *Generational Accounting—Knowing Who Pays, and When, for What We Spend* (New York: The Free Press, forthcoming March 1992).

### The Nature of Generational Accounts

The budget normally measures receipts and outlays for one year at a time. It usually shows these estimates for only a few years into the future, and even the long-range projections displayed in Chapter 2 extend only to 2001. The standard budget presentation, moreover, while it divides up receipts and outlays in a number of complementary classifications, does not organize the results in a way that compares the effects of policy on different generations.

Generational accounts, in contrast, are forward looking over a period of many years; and they classify taxes paid and transfers received—social security, medicare, food stamps, and so forth—according to the generation that pays or receives the money. For an existing generation, they estimate the taxes and transfers year-by-year over its entire remaining lifespan; and they summarize these amounts for a generation in terms of one number, the present value of its entire annual series of average future payments and receipts.<sup>2</sup> For future generations, generational accounts estimate the net payments based on the proposition that the government's bills will have to be paid either by people who are now alive or by future generations. They calculate how much future generations will have to pay to the government, above the amounts they will receive in transfers, if the government's total spending is not reduced from the projected path and if the people now alive do not pay more than projected.

Defined more precisely, generational accounts measure, as of a particular base year, the present value of the future taxes that the average member of each given generation is estimated to pay to the government minus the present value of the future transfers that the average member is estimated to receive. This difference is called the "net payment" in the following discussion. A generation is defined as all the males or all the females who are born in one given year.

Generational accounts can be used to make two types of comparison. First, they can be used to compare the net payment by future generations and the generation of people just born. These groups are comparable because their generational accounts cover all the taxes they will pay and all the transfers they will receive during their entire lifetimes.

The net payments of generations born in past years, however, cannot be compared at the present stage of development of the accounts. This is because their future taxes and transfers are only part of the taxes

<sup>2</sup>The "present value" is the value to someone at the present time of amounts of money that he will pay or receive in the future. The value of \$1.00 to be paid or received today is simply \$1.00. Future amounts, however, are discounted for the fact that they are not yet available. The disadvantage of not having money available until the future is the loss of interest that could otherwise be earned on the money in the meanwhile. Therefore, the discounted value is based on the interest rate. The discounted value is smaller for years farther into the future, because the loss of interest earnings is greater as interest is lost for more years.

and transfers over their entire lifetimes. The portion remaining in the future differs depending on whether a generation is 10, 40, or 80 years old. Generational accounts therefore cannot be used to judge whether the government is treating a generation born in the past well or poorly compared to any other existing generation or future generations. Comparison of the lifetime net payment of existing generations is a goal for future research.

Secondly, generational accounts can be used to compare the effects of actual or proposed policy changes. These effects can be compared for all generations, including those born in past years, because the changes in lifetime taxes and transfers will all be in the future and thus are included in the comparison. This comparison can be made equally well for policies that change the totals of receipts or expenditures and those that change the composition of the budget without affecting the deficit.

When using generational accounts, their scope needs to be kept in mind. These accounts, unlike almost every other table in this budget, include the taxes and transfers of all levels of government alike—Federal, State, and local. The baseline generational accounts thus do not show the separate effect of the Federal budget as a whole. Since the difference in generational accounts due to a policy change can be confined to the Federal Government alone, this limitation does not affect the ability to use generational accounts in assessing the effects of a change in Federal policy.

Generational accounts reflect only taxes paid to the government and transfers received. They do not impute to particular generations the value of the government purchases of goods and services made to provide them with education, highways, national defense, and other services. Therefore, they do not show the full net benefit or burden that any generation receives from government policy as a whole, although they can show a generation's net benefit or burden from a particular policy change that affects only taxes and transfers. Imputations appear feasible for certain types of government purchases, such as for primary school education, and they could be included in future improvements of generational accounts.

Generational accounting also does not, as yet, incorporate any feedback effects of policy on the economy's growth and interest rates. Feedback effects can be significant, but they generally occur slowly, so their impact on the discounted values used in the generational accounts may be small. Moreover, there is reason to believe they would reinforce the conclusions derived here. For example, policies that decrease the net payment by current generations and increase the net payment by future generations are likely to reduce investment over time. This, in turn, will lower real wage growth and raise real interest rates, which on balance will harm future generations in absolute terms.

Even within the scope of generational accounts as now constructed, the results in this chapter should be viewed as illustrative. They are necessarily based on a number of simplifying assumptions, about which reasonable people may disagree, concerning the pattern of future taxes and transfers, the interest rate used

to discount future taxes and transfers to form present values, mortality rates, birth rates, and so forth. The absolute amounts of the generational accounts are sensitive to these assumptions. However, the generational accounts can be illuminating when considered in the light of their assumptions, as has been the case for the 75-year projections made every year by the social security trustees. Moreover, the most fundamental result holds for a wide range of reasonable changes in the assumptions: the net payment by future generations is relatively much larger than the net payment by the generation just born.

The following sections illustrate the results of generational accounting. An appendix explains the concepts, calculations, and other assumptions more fully.

### The Remaining Net Payments by Existing Generations

Tables 26-1 and 26-2 show the generational accounts as of calendar year 1990 for every fifth generation of males and females alive in that year. The first column, "net payment," is the difference between the present value of taxes that an average member of each generation will pay over his remaining life and the present value of the transfers he will receive. The other columns show the average present values of the different taxes and transfers. All Federal, State, and local taxes and transfers are included in these calculations. Because of the time needed to prepare these estimates, Federal spending and receipts are based on the baseline in the *Mid-Session Review of the 1992 Budget* rather than the policy in the present budget.

The young and middle aged generations will pay much more in future taxes in present value than they will receive in future transfers. For males who were age 40 in 1990, for example, the present value of future taxes is \$177,000 more than the present value of future transfers. These amounts are large because these generations are nearing their peak tax paying years. For newborn males, on the other hand, the present value net payment is much smaller, \$76,000. They will not pay much in taxes for a number of years. The older generations, who are largely retired, have negative net payments. They will receive more social security, medicare, and other future benefits than they will pay in future taxes. Females have smaller net payments than males, mostly because they earn less income and therefore pay less income and social security taxes.

As emphasized previously, the net payment by a generation does not include the taxes paid or the transfers received in the past. This needs to be kept in mind in considering the net payments by those now alive. The fact that 40 year-old males can expect to pay more in the future than they receive, in present value terms, while the reverse is true for 65 year-old males, does not mean that the Federal, State, and local governments are treating 40 year-old males unfairly. Males who are now 65 years old paid considerable taxes when they were younger, and these past taxes are not included in the accounts. Therefore, as noted above, the net payment by one existing generation cannot be directly compared with another.

Table 26-1. GENERATIONAL ACCOUNTS FOR MALES: PRESENT VALUE OF TAXES AND TRANSFERS AS OF 1990

(In thousands of dollars)

Generation's age in 1990	Net payment	Taxes paid				Transfers received		
		Labor income taxes	Capital income taxes	Payroll taxes	Excise taxes	Social security	Health	Welfare
0	76.4	28.6	10.9	30.3	26.3	5.5	10.9	3.3
5	98.1	36.7	14.1	38.9	30.5	6.8	11.1	4.2
10	123.6	46.9	17.9	49.7	34.8	8.2	12.1	5.4
15	154.8	59.9	23.0	63.5	38.9	10.0	13.7	6.9
20	182.2	71.3	28.7	75.9	41.4	11.9	15.1	8.1
25	196.8	76.5	35.5	81.5	42.5	14.1	16.6	8.5
30	201.1	77.1	42.7	82.3	42.8	17.1	18.5	8.1
35	195.2	74.0	49.8	79.1	42.3	21.2	21.3	7.5
40	177.4	67.5	55.3	72.3	40.7	26.6	24.9	6.9
45	146.3	58.1	58.2	62.3	37.8	34.5	29.3	6.4
50	103.9	46.7	57.8	50.2	34.0	44.9	34.2	5.8
55	52.2	34.5	54.2	37.1	29.9	58.5	39.8	5.2
60	-6.4	21.5	47.9	23.3	25.6	74.5	45.7	4.6
65	-58.3	9.7	40.0	10.5	21.4	83.0	52.9	4.0
70	-65.1	4.3	31.6	4.6	17.5	71.7	47.9	3.5
75	-58.2	1.9	23.9	2.1	14.0	55.7	41.6	2.8
80	-47.5	0.6	18.2	0.6	11.0	41.8	34.3	1.9
85	-35.8	—	15.1	—	8.9	31.6	27.3	0.8
90	-2.0	—	6.9	—	1.8	5.8	4.9	*
Future generations	136.9	—	—	—	—	—	—	—
Percentage difference: future generations and age zero ..	79.2	—	—	—	—	—	—	—

\* \$0.05 thousand or less.

Table 26-2. GENERATIONAL ACCOUNTS FOR FEMALES: PRESENT VALUE OF TAXES AND TRANSFERS AS OF 1990

(In thousands of dollars)

Generation's age in 1990	Net payment	Taxes paid				Transfers received		
		Labor income taxes	Capital income taxes	Payroll taxes	Excise taxes	Social security	Health	Welfare
0	29.7	16.1	4.1	17.0	24.0	6.1	18.7	6.6
5	41.0	20.6	5.2	21.8	27.9	7.5	18.6	8.5
10	53.5	26.3	6.7	27.9	32.5	8.9	20.1	10.9
15	67.8	33.5	8.6	35.6	37.2	11.0	22.3	13.8
20	79.4	39.4	10.7	42.0	40.6	13.2	24.3	15.7
25	83.4	40.5	13.3	43.3	42.5	15.8	26.2	14.1
30	81.4	39.0	16.7	41.6	43.1	18.7	28.7	11.6
35	74.8	36.4	20.4	38.9	42.6	22.1	32.2	9.3
40	62.5	32.7	23.7	35.0	41.1	26.0	36.7	7.3
45	42.6	27.9	26.2	29.9	38.5	31.9	42.4	5.6
50	15.4	22.3	27.4	23.9	35.1	40.1	48.9	4.3
55	-19.4	16.1	27.2	17.3	31.2	51.5	56.1	3.5
60	-58.0	10.0	25.4	10.8	27.1	64.8	63.4	3.0
65	-88.4	5.1	22.4	5.5	23.1	70.9	70.9	2.7
70	-90.0	2.2	18.5	2.3	19.4	64.9	65.0	2.4
75	-81.0	0.7	14.0	0.7	16.0	54.0	56.3	2.1
80	-67.5	*	9.3	*	13.0	42.5	45.7	1.7
85	-53.0	—	4.7	—	10.5	32.3	34.6	1.3
90	-8.1	—	0.5	—	1.8	5.0	5.2	0.2
Future generations	53.2	—	—	—	—	—	—	—
Percentage difference: future generations and age zero ..	79.2	—	—	—	—	—	—	—

\* \$0.05 thousand or less.

### The Net Payments by Future Generations

Future generations—those born in 1991 and later—are estimated to make a 79 percent larger net payment to the government, on average, than those born in 1990. The \$137,000 net payment by the average future male and the \$53,000 net payment by the average future female assume that the ratio of net payments by males to that of females is the same for future generations as for those born in 1990. They also assume that all those of a particular sex born in the future will make

the same net payment over their lifetimes after adjusting for economic growth.

A growth adjustment is needed because future generations can be expected to pay more in taxes, net of the transfers they receive, simply because their incomes will be higher. To properly assess the relative net payment by future generations, it is necessary to calculate the net payment they would make above and beyond the amount that would arise due to economic growth. Assuming that all future generations pay the

same amount after the adjustment for growth, one number in the table stands for all future generations of the same sex.

The size of the imbalance between future generations and the newly born is sensitive to the assumptions about the interest rate used for discounting and the growth rate of the economy. Table 26-3 shows the percentage differential under alternative assumptions. It considers interest rates of 3, 6, and 9 percent and productivity growth rates of 0.25, 0.75, and 1.25 percent. The central assumptions used in this chapter were an interest rate of 6 percent and a growth rate of 0.75 percent. This led to a 79 percent larger net payment by future generations than the newly born. Under the alternatives in table 26-3, the difference ranges from 51 percent to 146 percent. While this differential is large, the basic conclusion is unchanged. Future generations are estimated to make a much larger payment of taxes to the government, net of transfers received, than those just born.

Table 26-3. PERCENTAGE DIFFERENCE IN NET PAYMENTS OF FUTURE GENERATIONS AND AGE ZERO FOR ALTERNATIVE ASSUMPTIONS

Interest rate	Growth rate		
	0.25	0.75	1.25
3.0 .....	90	68	51
6.0 .....	107	79	58
9.0 .....	146	108	77

The generational imbalance also depends on the policy assumption that all future generations of the same sex have the same net payment (after adjusting for growth). Alternatively, suppose that the future generations born during 1991-2000 pay only the same amount as the generation born in 1990. Because these future generations pay less than previously assumed, those future generations born after 2000 will have to make a net payment that is 133 percent larger, rather than 79 percent larger, than the net payment of the 1990 generation. The longer the delay in changing policy, the larger the net payment by generations after the change is made.

### The 1990 Budget Agreement

The Omnibus Budget Reconciliation Act of 1990 (OBRA) enacted an agreement between the President and the Congress to reduce the Federal deficit by about half a trillion dollars compared to what it would otherwise have been over the period from fiscal year 1991 through fiscal year 1995.

The first column of tables 26-4 and 26-5 shows the impact of OBRA on the generational accounts. It equals the difference between the 1990 baseline generational accounts (column one of tables 26-1 and 26-2), which include OBRA, and the 1990 generational accounts that would have prevailed in the absence of OBRA. OBRA is assumed to permanently change the projected paths of spending and receipts. Had OBRA not been enacted, future generations of males would have had to pay \$10,700 more on average (on a growth-adjusted basis). Their net payment would have been 97 percent higher, instead of 79 percent higher, than the net payment by people born in 1990. The reduction of net payments

by future generations under OBRA came at the cost of higher net payments by existing generations. For males alive in 1990, the increased net payment ranged from \$1,500 for those born in 1990, to \$2,900 for 30 year-olds, to \$200 for 85 year-olds. In effect, OBRA imposed a relatively small sacrifice on living generations to achieve a significant reduction of the burden on future generations.

The effects of OBRA depend crucially on whether it permanently affects the budget. Column two shows the result if taxes and transfers return to their previous paths after 1995. Future generations would pay 93 percent more in taxes, net of the transfers they receive, than the generation of people just born. Except for older generations, most of the effect of OBRA on generational accounts depends on budget policy after 1995.

### Illustrative Policy Changes

The other columns of tables 26-4 and 26-5 further illustrate the use of generational accounts in analyzing policy changes. Column three shows the effect of returning social security to pay-as-you-go finance. Under this policy, social security taxes are adjusted each year so that the social security trust fund receipts from taxes, interest, and other sources are just enough to meet benefit payments. While this would reduce social security payroll taxes in the near-term and thus lower the net payments made by those who were in their twenties or older in 1990, their benefit would be at the expense of younger and future generations. For example, 40 year-old males would have a \$4,500 decrease in their remaining lifetime net payments to the government, whereas newly born males would have a \$4,000 increase. The absolute increase in net payment by future generations would be larger still, \$4,600, but in relative terms future generations and the newly born would remain nearly the same.

A large part of the heavy net payments by future generations in the baseline, compared to people just born, is because government spending for medicare and medicaid is growing exceptionally fast. The baseline generational accounts use the middle scenario through 2030 that was recently published by actuaries at HCFA (Health Care Financing Administration) in the Department of Health and Human Services.<sup>3</sup> After 2030 health care transfers are assumed to stabilize as a percentage of GNP, apart from the effect of changes in the composition of the population by age and sex.

The fourth and fifth columns of tables 26-4 and 26-5 show the impact on the generational accounts that would result from stabilizing health care spending (apart from demographic change) as a percentage of GNP after 1995 and after 2000, respectively, rather than after 2030. Existing generations would receive less transfers than under the HCFA projections used for the baseline and so would make a larger net payment to the government. This, in turn, would mean a smaller net payment by future generations. Early stabilization of health care spending can have quite significant effects. If it is stabilized as a percentage of GNP (apart

<sup>3</sup> For a discussion of this scenario and projections to 2000, see Sally Sonnfeld and others, "Projections of National Health Expenditures through the Year 2000," *Health Care Financing Review* (volume 13, Fall 1991).

Table 26-4. CHANGES IN GENERATIONAL ACCOUNTS FOR MALES DUE TO ALTERNATIVE POLICIES AS OF 1990

(In thousands of dollars)

Generation's age in 1990	OBRA not enacted	OBRA effects end in 1995	Pay-as-you-go social security	Stabilizing health care spending after—	
				1995	2000
0 .....	-1.5	-1.4	4.0	3.1	1.9
5 .....	-1.8	-1.6	3.4	3.6	2.2
10 .....	-2.1	-1.9	2.3	4.0	2.5
15 .....	-2.5	-2.1	0.7	4.7	2.9
20 .....	-2.8	-2.2	-1.2	5.2	3.3
25 .....	-2.9	-2.2	-2.7	5.9	3.8
30 .....	-2.9	-2.1	-3.7	6.8	4.4
35 .....	-2.8	-1.9	-4.3	8.0	5.3
40 .....	-2.6	-1.7	-4.5	9.5	6.3
45 .....	-2.3	-1.4	-4.2	11.1	7.2
50 .....	-2.0	-1.1	-3.5	12.3	7.4
55 .....	-1.6	-0.8	-2.7	12.7	6.5
60 .....	-1.2	-0.6	-1.7	11.2	4.9
65 .....	-0.8	-0.4	-0.8	8.6	3.2
70 .....	-0.6	-0.3	-0.3	6.0	1.8
75 .....	-0.4	-0.2	-0.2	3.5	0.7
80 .....	-0.3	-0.1	-0.1	1.7	—
85 .....	-0.2	—	—	—	—
90 .....	0.1	—	—	—	—
Future generations .....	10.7	8.0	4.6	-45.0	-26.6
Percentage difference in net payment: future generations and age zero .....	97.1	93.2	76.0	15.5	40.8

Table 26-5. CHANGES IN GENERATIONAL ACCOUNTS FOR FEMALES DUE TO ALTERNATIVE POLICIES AS OF 1990

(In thousands of dollars)

Generation's age in 1990	OBRA not enacted	OBRA effects end in 1995	Pay-as-you-go social security	Stabilizing health care spending after—	
				1995	2000
0 .....	-1.1	-1.0	2.0	5.1	3.1
5 .....	-1.3	-1.2	1.6	5.7	3.5
10 .....	-1.5	-1.4	0.9	6.4	3.9
15 .....	-1.8	-1.6	*	7.2	4.4
20 .....	-2.0	-1.6	-0.9	8.0	5.0
25 .....	-2.1	-1.6	-1.6	8.8	5.6
30 .....	-2.1	-1.5	-1.9	10.0	6.4
35 .....	-2.0	-1.4	-2.1	11.5	7.4
40 .....	-1.9	-1.2	-2.2	13.4	8.7
45 .....	-1.7	-1.1	-2.0	15.5	9.9
50 .....	-1.4	-0.9	-1.7	17.2	10.4
55 .....	-1.2	-0.7	-1.2	18.0	9.6
60 .....	-0.9	-0.5	-0.8	16.5	7.8
65 .....	-0.7	-0.4	-0.4	13.3	5.5
70 .....	-0.5	-0.3	-0.2	9.8	3.3
75 .....	-0.4	-0.2	-0.1	6.1	1.4
80 .....	-0.3	-0.1	—*	2.9	—
85 .....	-0.2	—	—	—	—
90 .....	*	—	—	—	—
Future generations .....	3.1	2.2	2.6	-13.0	-7.1
Percentage difference in net payment: future generations and age zero .....	97.1	93.2	76.0	15.5	40.8

\* \$0.05 thousand or less.

from demographic change) after 2000, the net payment by future generations of males is reduced by \$26,600; and the net payment is 41 percent more than the net payment of those just born, instead of 79 percent as

in the baseline. If health care spending is stabilized after 1995, the net payment by future generations of males is reduced by \$45,000; and relative to those just born the net payment would be only 16 percent higher.

## APPENDIX: CONSTRUCTION OF THE GENERATIONAL ACCOUNTS

### The Present Value Constraint

Generational accounting is based on the present value budget constraint of the government sector. In simple terms it says that the government must ultimately pay for its purchases of goods and services with resources it obtains from current and future generations or with its current assets (net of debt). If current generations pay less in taxes (net of transfers received) to cover government purchases, future generations will have to pay more. For illustration, suppose that through borrowing the payments for the government's bills were repeatedly shifted to future generations by each successive current generation. Then this debt would grow, with interest. Eventually the interest would exceed the lifetime income of future generations, which would result in default.

More precisely, the government's present value constraint says that, at any point in time, the present value of the government's future purchases of goods and services cannot exceed the sum of three items: (1) the present value of future taxes to be paid (net of transfers received) by existing generations (i.e., the sum of their generational accounts multiplied by the number of people in each generation), (2) the present value of taxes to be paid (net of transfers received) by future generations, and (3) the value of government assets that yield income, less the government debt. Generational accounting estimates the present value of the government's purchases of goods and services and the amounts (1) and (3). Amount (2), the present value of taxes to be paid by all future generations (net of transfers received), is calculated as the present value of future government purchases minus amounts (1) and (3).

The generational accounts for future generations are derived from the aggregate amount (2). For most of the illustrations in this chapter, different net payments (after adjusting for economic growth) are not estimated for different future generations. Rather, the aggregate present value net payment by future generations is divided on an even basis among all the future generations in such a way that the net payment by the average member of each generation keeps pace with the economy's growth in productivity. Thus, as shown in tables 26-1 and 26-2, one single (growth adjusted) average figure stands as the generational account for all future generations of a given sex. Because the generational account is calculated indirectly from the above aggregates, rather than from specific taxes and transfers, it can only be shown as a total amount.

### The Underlying Calculations

The calculation of the generational accounts is a three-step process. The first step entails projecting each currently living generation's average taxes and transfers to each future year in which at least some member of the generation will be alive. The second step converts these projected average taxes and transfers into a present value, using assumptions for the discount rate and the probability that the generation's members will be alive in each of the future years. The sum of these

present values, with transfers subtracted from taxes, is the generational account or "net payment" for existing generations shown in the first column of tables 26-1 and 26-2. The third step is to estimate the other terms of the present value constraint explained in the previous section so as to derive the average net payment by future generations. The calculations are based on projections to 2200.

**Projection of taxes and transfers.**—The projection of average future taxes and transfers begins with the national totals of all Federal, State, and local taxes and transfers as reported by the national income and product accounts (NIPAs) for calendar year 1990. (All years in this chapter are calendar years unless otherwise stated.) The relationship of the NIPA data to the Federal budget is described in Chapter 27. Employee retirement and veterans benefits paid by government are considered a form of employee compensation and classified as the purchase of a service rather than a transfer payment.

The base year NIPA totals are distributed to all existing generations, as defined by age and sex, based on the corresponding distributions in cross-section survey data. These surveys include the Survey of Income and Program Participation by the Bureau of the Census and the Survey of Consumer Expenditures by the Bureau of Labor Statistics. Those taxes not directly paid by persons and so not appearing in these surveys, such as the corporation income tax, are allocated. Since generational accounting attributes taxes and transfers to individuals, household taxes and transfers are attributed to the individuals in the household. The attribution rules affect the values of the baseline accounts but are not likely to alter the generational implications of policy changes.

The distribution of average taxes and transfers by age and sex in the future is assumed to equal the base year average amounts after adjustments for growth and projected policy. In the case of Federal taxes and transfers for 1991-95, the amounts correspond to the estimated tax and transfer totals in the *Mid-Session Review of the 1992 Budget* (July 1991), updated for the actual fiscal year 1991 results. These estimates take into account the provisions of OBRA. In the case of State and local taxes and transfers for 1991-95, the amounts are based on the GNP assumptions in this budget and the assumption that the ratios of State and local tax and transfer aggregates to GNP remain constant at the 1990 levels. After 1995 the average taxes and transfers by age and sex are assumed, with two exceptions, to increase at the assumed rate of productivity growth. Productivity (both labor and multi-factor productivity) is assumed to increase at 0.75 percent a year, which is close to the average annual rate of multi-factor productivity growth since 1970.

Social security and health care transfers are the two exceptions. The projected social security transfers take account of the provision in current law that gradually raises the age at which full retirement benefits are available beginning in 2000. The projected medicare

and medicaid transfers through 2030 are the HCFA middle scenario estimates, as explained above. They are assumed to increase subsequently at the rate of productivity growth with an adjustment for demographic change.

**Assumptions for present value.**—The appropriate discount rate for calculating the present value of future amounts depends on whether or not these amounts are known with certainty. Future government receipts and expenditures are risky, which suggests that they be discounted by a rate higher than the real rate of interest on government securities. On the other hand, government receipts and expenditures appear to be less volatile than the real return on capital, which suggests that they be discounted by a lower rate than that. The baseline calculations assume a 6 percent real discount rate, which is intermediate between the roughly 2 percent average real return available in recent years on short-term Federal securities and the roughly 10 percent real return available in recent years on capital.

The present values of future average taxes and transfers are also discounted for mortality probabilities. The probabilities through 2066 are those embedded in the social security trustees' intermediate projection (alternative II) in 1991 of the population by age and sex. The mortality probabilities in 2066 were used for later years.

**Other projections.**—Federal purchases of goods and services through 1995, like Federal taxes and transfers,

are from the latest *Mid-Session Review* updated for the actual fiscal year 1991 results. State and local purchases through 1995 are kept at the same ratio to GNP as in 1990. Federal, State, and local purchases after 1995 were divided between (1) those made on behalf of specific age groups—the young, middle aged, and elderly—such as educational expenditures; and (2) those that are more nearly pure public goods, such as defense and public safety. Purchases per person in each of the three age groups, and purchases of public goods per capita, increase at the assumed rate of productivity growth.

The economic value of the government's assets that yield income, less the government debt, was estimated by capitalizing the government's net interest in the NIPAs (with some minor adjustments, including one for the current surplus of government enterprises). Net interest was divided by a nominal interest rate calculated as the sum of the assumed real interest rate (6 percent) and the 4.1 percent rate of inflation in 1990 as measured by the GNP deflator.

The average growth-adjusted net payment to be made by future generations was determined by the aggregate present value of the net payment (as derived through the present value budget constraint), by the assumed productivity growth, and by the projected size of future generations. The size of future generations was estimated using the social security alternative II projection through 2066 and the demographic assumptions for 2066 applied to later years.