

## ***Proposals to Modify the Taxation of Social Security Benefits: Options and Distributional Effects***

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This article presents simulation estimates of the income-distributional effects in 1994 of several proposals to modify the taxation of Social Security benefits under the Federal personal income tax.

Under the benefit-taxation provisions that have been in effect since 1984, up to 50 percent of benefits are included in taxable income for taxpayers with incomes above certain thresholds. In 1994 about 20 percent of beneficiary families will pay a larger income tax as a result of these provisions. Because of the benefit taxation thresholds, the affected families are concentrated in the upper half of the income distribution: about 70 percent of these families have incomes that put them in the top 30 percent of families by income.

If the current taxation thresholds were kept and the percentage of benefits includable in taxable income were raised above 50 percent, the tax effect would remain concentrated on the upper income families. If, on the other hand, the percentage includable were kept at 50 percent while the taxation thresholds were lowered or eliminated, more beneficiary families with incomes in the middle deciles would become affected. The lowest income beneficiary families, however, would remain unaffected, because their benefits would be protected from income taxation by exemptions and the standard deduction. The simulations indicate that only a very few families in the bottom 20 percent of families by income would be affected even if the benefit taxation thresholds were eliminated entirely.

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Before 1984, Social Security benefits were not taxable under the Federal personal income tax. Many tax analysts had for a long time considered this exemption from taxation unnecessary and inequitable, arguing that there were no compelling reasons to tax Social Security benefits more lightly than other forms of income. Partly in response to these longstanding calls for a more equitable taxation of benefits, and partly in response to an immediate need to find new sources of financing to relieve projected Social Security trust fund deficits, the U.S. Congress in 1983 enacted legislation to include in the tax base, starting in 1984, up to half of the Social Security benefits of taxpayers with incomes above certain threshold levels, with the proceeds from the tax to be put into the Social Security trust funds.<sup>1</sup>

Many of the advocates of benefit taxation have not found the equity arguments for benefit taxation to be fully satisfied by the limited taxation of benefits introduced in the 1983 reform. As a result, there have been continued calls for an increase in the taxation of benefits.<sup>2</sup> Furthermore, although the immediate trust fund problems have been taken care of, the continuing deficits in the combined budget and today's more stringent requirements for balancing legislated changes in Social Security financing and expenditures have made the as-yet untaxed portion of Social Security benefits a tempting source for deficit reduction or for the financing of other Social Security reforms.<sup>3</sup>

The equity argument for the taxation of benefits is one of *horizontal equity*, comparing the tax treatment of retirees with equal total incomes. Before 1984, for example, a retiree whose income was made up of 40 percent Social Security benefits and 60 percent pension income would typically have paid less in income taxes than a retiree with the same total income but whose income was made up of 20 percent Social Security benefits and 80 percent pension income. The 1983 reform closed part of this gap between the treatment of pensions and the treatment of Social Security benefits, at least for high-income retirees.<sup>4</sup>

Although the introduction of benefit taxation in 1984 and the further modifications that have been proposed since then

have usually been advocated for reasons of horizontal equity, they also raise questions of vertical equity, having to do with the appropriate tax treatment of taxpayers with different total incomes. Before 1984, upper-income retirees gained the most from the non-taxation of Social Security benefits, both because their Social Security benefits tended to be higher and because, due to the progressive structure of the personal income tax rates, a tax exemption of a given size is worth more to a taxpayer in the higher tax brackets. The reduction of the horizontal inequity in 1984, therefore, when measured in terms of dollars per taxpayer, fell most strongly on upper-income taxpayers, and would have done so even without the taxation thresholds, which focussed the impact even more narrowly on the upper deciles of taxpayers. As will be shown in this article, even when measured as a percent of taxpayers' income, a widely used yardstick for the analysis of vertical equity, the current-law taxation of benefits tends to rise with income at all but the highest incomes. This income-distributional pattern of impact will not necessarily hold constant under further modifications of the taxation of benefits.

This article, accordingly, presents estimates (produced by the Social Security Administration's (SSA's) Simulated Tax and Transfer System—STATS—microsimulation model) of the income-distributional effects for 1994 of both current-law benefit taxation and some of the more common proposals for modifying the taxation of Social Security benefits. The article is organized as follows: first we survey the range of proposals for changing the taxation of benefits and select some of them for simulation. Next we discuss the simulation population and the simulation of current-law benefit taxation. We then examine one of the main options for changing the taxation of benefits—raising the inclusion percentage from 50 percent to 85 percent. After that we examine eliminating the taxation thresholds. Following that we simulate a number of other possible variants for changing the taxation of benefits. The final section summarizes some of the patterns among the various plans.

## Background and Proposals for Reform

Under the current taxation of Social Security benefits, up to 50 percent of benefits are included in taxable income. The full 50 percent, however, is included only for taxpayers whose incomes exceed the benefit taxation threshold by an amount that depends on their benefits. (For married filers filing a joint return, the benefit taxation threshold is \$32,000; for married filers who are not living separately and who do not file a joint return, the threshold is \$0; for everyone else, the threshold is \$25,000. This last category includes single persons, head-of-household filers, qualifying widows, and separate returns for married persons who do not live with their spouses.) To determine the amount of taxable benefits, a taxpayer first calculates adjusted gross income (AGI) without including any Social Security benefits. The taxpayer then adds 50 percent of his or her Social Security benefits, plus any tax-exempt interest income, to this preliminary AGI. If the sum exceeds the taxation threshold the taxpayer must include in AGI 50 percent of the excess, but not more than the maxi-

imum includable amount of 50 percent of benefits.

This procedure for calculating the includable benefit is designed to phase in the taxation of benefits. If non-Social-Security AGI plus tax-exempt interest income is less than the taxation threshold by at least half of Social Security benefits, none of the benefits will be included in AGI. If non-Social-Security AGI plus tax-exempt interest income exceeds the taxation threshold by at least half of benefits, the full 50 percent of benefits will be included. For non-Social-Security AGI between these two limits, the includable benefit will be greater than zero but less than the full 50 percent. Chart 1 demonstrates these variants. (The benefit will be called the "includable benefit" (rather than the "taxable benefit") because under proposals that eliminate the thresholds many taxpayers with benefits includable in AGI will still have taxable incomes after exemptions and deductions of zero, and would therefore not pay any tax on their benefits. This article will refer to benefits as being included in gross taxable income even when taxable income is zero.)

Chart 1.—The benefit taxation phase-in under current law

For comparison with other proposals to tax Social Security, it is helpful to have the phase-in calculation written as a formula.

If

$B$  is the tax unit's Social Security benefits,

$Y$  the tax unit's non-Social-Security AGI,

$TF$  the tax unit's tax free interest income and

$T$  the benefit taxation threshold (\$32,000 or \$25,000),

then the amount of benefits includable in gross taxable income is

$$\text{Includable Benefit} = \text{MIN}\{.5B, \text{MAX}(0, .5 [Y + TF + .5B - T])\}.$$

This can be comprehended more easily by dividing income into ranges:

If  $Y + TF \leq T - .5B$ , then the Includable Benefit is 0.

If  $Y + TF \geq T + .5B$ , then the Includable Benefit is  $.5B$ .

Otherwise, the Includable Benefit is  $.5 [Y + TF + .5B - T]$ .

The 1983 solution was a compromise, and pressure has continued since then to move the point of compromise. Proposals to alter the taxation of benefits take one or both of two forms: changing the taxation thresholds, and/or raising the percentage of benefits includable in gross taxable income.

In a sense, the thresholds are already being lowered, gradually but automatically, because they are given in fixed nominal amounts. As incomes rise, whether through growth in real incomes or through inflation, an increasing proportion of the beneficiary population will have incomes above the thresholds and will therefore have at least some of their benefits taxed.

The lack of an indexing provision for the thresholds was not an oversight by Congress. When the 1979 Advisory Council for Social Security first proposed taxing 50 percent of benefits, there were no taxation thresholds. After this proposal encountered immediate and widespread resistance from Congress, it was suggested by some advocates (see Munnell 1982) that benefit taxation might be made politically more feasible if taxation thresholds were used similar to the ones then in use for the taxation of unemployment compensation. (The income taxation of unemployment compensation had been enacted in 1978, using phase-in thresholds of \$25,000 for married couples and \$20,000 for individuals.) By leaving the thresholds unindexed for inflation, they would diminish in importance as the years passed, with the result, as Munnell pointed out, that "as incomes and Social Security benefits increase gradually over time, the revenue gain will approach that of including half of Social Security benefits in taxable income for all retirees."<sup>5</sup> The 1983 National Commission on Social Security Reform followed this suggestion, proposing the same thresholds as were used in the taxation of unemployment compensation, but specifying that benefits be taxable only for those with AGI's above the threshold "before including therein any OASDI benefits." (Unemployment compensation was taxed if income plus half of unemployment compensation was above the threshold.) In order to use the phase-in mechanism

while at the same time meet the Commission's specification that no taxpayers with non-Social-Security income below the unemployment compensation thresholds be affected, the thresholds enacted in the 1983 law were set higher, to \$32,000 for couples and \$25,000 for single taxpayers. Amendments to index the thresholds were rejected by Congress (Myers 1985).

Congress, therefore, fixed the thresholds quite deliberately and has left them unindexed, although bills to index the thresholds for inflation have been introduced in Congress from time to time since 1983. Because of this abiding interest in indexation by some legislators, one proposal that will be simulated in this article is a proposal to raise the thresholds in 1994 to the level they would have been if they had been price-indexed since 1984.

The remaining simulated threshold-modification proposals will be those to lower the thresholds or eliminate them immediately. Such proposals have a precedent in the taxation of unemployment compensation. In 1983 legislation, the unemployment compensation thresholds were reduced to \$18,000 for couples and \$12,000 for individuals. A few years later, the 1986 Tax Reform Act eliminated the unemployment compensation thresholds entirely, effective in 1987. The unemployment compensation thresholds, enacted in 1978 to start in 1979, lasted only 8 years.

The rationale given by those who advocate eliminating the thresholds is that the income tax personal exemptions and standard deductions are designed to protect low-income families from taxation, and there is no reason to add special protections for Social Security beneficiaries. The 1979 Advisory Council for Social Security determined that almost no elderly persons or couples for whom Social Security was the only source of income would pay additional taxes if half of benefits were taxed, even without income thresholds. Although the tax treatment of the aged has changed since then (the double exemption for the aged has been eliminated, but the aged have been given a larger standard deduction), it still remains true that benefits are low enough compared with income tax stan-

dard deduction and exemption that very few of those elderly with nothing but Social Security income would pay taxes if the thresholds were eliminated.

The other possibility for a change in the taxation of benefits is a change in the percentage of benefits includable in gross taxable income. A minority of the 1979 Advisory Council proposed including more than 50 percent of benefits in gross income, and proposals continue to be made to raise the inclusion percentage. Inclusion percentages higher than 50 percent are advocated based on an analogy with the "exclusion ratio" method used in the taxation of annuities and those pensions that include contributions from employee after-tax income.<sup>6</sup> The exclusion ratio is an attempt to adjust the taxation of the pension or annuity payment based on the fact that the taxpayer has already paid taxes on some of the funds that went into building up the annuity. The exclusion ratio is defined as the ratio at retirement of past employee contributions to an estimate of expected future benefits. (Most private pensions, and many public pensions,<sup>7</sup> in contrast, are funded entirely from untaxed contributions, and have an exclusion ratio of zero.) A pension of \$15,000 a year, for example, might under Internal Revenue Service guidelines have expected lifetime payments of 20 times that amount, or \$300,000. If the employee had paid \$40,000 in contributions to the pension over his or her working career, he or she would be allowed under the exclusion ratio procedure to exclude 13.3 percent of his or her pension benefit each year from taxation (\$40,000 is 13.3 percent of \$300,000). Although the income tax regulations regarding pensions are formulated in terms of *exclusion* ratios, Social Security taxation is usually formulated in terms of the percent of benefits *included* in gross taxable income. The 13.3 percent *exclusion* percentage in the example would be equivalent to an 86.7 percent *inclusion* percentage.

The inclusion ratios for pensions are calculated for each individual worker and vary from worker to worker. Proposals for applying the inclusion ratio to Social Security benefits have tended to adopt a single inclusion percentage for all work-

ers, set at a level low enough that no worker would be taxed more than he or she would have been if the percentage had been calculated individually. Across groups disaggregated by gender, marital status, and earnings, the group with the lowest inclusion percentage is that of high-earning, never-married males. Calculations by SSA have indicated that for a wide range of cohorts—those entering the labor force between 1965 and 2000—the inclusion ratio for these high-earning, never-married males would be about 85 percent.<sup>8</sup> All other types of workers, those who have lower earnings, or who are female or married, or who come from earlier or later cohorts, would have an inclusion percentage equal to or higher than 85 percent (see Goss 1989). Hence, many proposals for increasing the inclusion percentage have adopted the 85 percent figure.<sup>9</sup>

The analogy with pensions takes into account the excess of retirement benefit payments over the past after-tax contributions by the retiring employee. Only this excess is subject to tax. Part of the excess, however, is due to inflation. In its tax reform proposals of 1984, the Treasury Department proposed adjusting pension exclusion ratios for inflation.<sup>10</sup> This type of adjustment, if applied to Social Security benefit taxation, results in much lower benefit inclusion percentages, usually estimated in the range of 60-70 percent.<sup>11</sup>

From the range of options that have been proposed or could be proposed, several have been selected for simulation in this article. Two major variants are analyzed first: raising the percentage to 85 (in the section “85-Percent Inclusion, Current-Law Taxation Thresholds”), and eliminating the thresholds (in the section “Other Proposals for the Taxation of Benefits”). The section “Other Proposals for the Taxation of Benefits” will then consider a range of other possibilities. The combination of proposals that raise the percentage to 85 while eliminating the thresholds will be dealt with first. Two proposals that keep the percentage at 50 will then be considered: one indexes the thresholds to inflation, and the other reduces but does not eliminate them. In the summary discussion at the conclusion

of this article, four other plans (65-percent and 100-percent inclusion, each with or without current-law taxation thresholds) will be referred to, even though detailed estimates for these proposals are not presented.<sup>12</sup>

The 1994 distributional effects of these various proposals to modify the taxation of benefits were estimated using the STATS model developed by SSA’s Office of Research and Statistics.<sup>13</sup> The STATS model uses information from the Census Bureau’s Current Population Survey (CPS) to estimate the Federal personal income taxes that are paid by families under the current tax law or that would be paid if some proposed change in the tax law were adopted. The CPS contains information drawn from interviews of a nationally representative sample of over 50,000 households containing more than 150,000 persons. The STATS model uses information on the relationships among persons within each household, their incomes, and their demographic traits to calculate the taxes of each family interviewed in the CPS. Basically, the STATS model replicates the process of filling out the tax forms. This requires that the STATS model first allocate individuals into tax filing units using information on family relationships and incomes. The taxes of each tax filing unit are then calculated using information on income from the CPS as well as some information imputed from other sources. Since a family can contain more than one tax unit, the current taxes paid by a family are the sum of the taxes paid by the family’s tax filing units. The STATS model can also estimate the taxes that would be paid if some change were made to the tax law. In this case, the model replicates the process of filling out a new set of tax forms, those that would exist if the change were adopted.<sup>14</sup>

For several reasons the CPS survey file is used for these estimates rather than an administrative file of tax returns. First, the administrative file would contain benefits only for those returns with benefits already taxable under current law, making estimates of the effects of removing thresholds more difficult. Second, the CPS family unit and the CPS income concept are considered more suitable for

the study of relative economic status, because CPS income includes some components of income not reported on tax returns and because for some families the income of the family is not represented on any one tax return but is split up among several tax returns that cannot be gathered together on the administrative file. Third, the CPS contains information not available from tax returns, such as the age of the taxpayer and the presence in the family of other persons not indicated on the tax return.

The simulation results presented in this article were created using the March 1992 public-use CPS. While the CPS contains most of the information necessary to simulate taxes, some information was also imputed from other data sources. The procedures used to replace top-coded income; to impute capital gains, tax-free interest income, and pension income; to adjust for underreported income; and to project to 1994 are described in the Appendix.

The simulation tables contain a column with estimates of the aggregate dollar effects of the various proposals. These aggregate amounts are presented to give an idea of the relative size of the proposals and of the distribution of the aggregate revenues by family income deciles. They should not be taken as the best estimates of the aggregate revenues from these proposals. Although some attempt has been made to adjust income amounts on the simulation to those found in administrative data, the goal has been to improve the distributional estimates rather than the aggregate revenue estimates. The adjustments focused entirely on calibrating average income amounts in taxable units to those found in administrative data; no attempt was made to adjust for coverage differences between the survey population and the administrative data population. The survey file is missing as many as 9 percent of elderly tax-paying units due to institutionalization of the elderly and to death that occurred before the time of the survey. How many of these units would pay a tax on benefits and how much they would pay is not known. Generally, however, the distributional estimates, both those referring to average dollar amounts per unit and those

referring to the distribution of amounts by family income decile, are not nearly as sensitive to small adjustments as are the estimates of aggregate revenues. If the survey file were adjusted to bring the aggregate dollar and number of return estimates exactly into line with estimates from other sources, the estimates of distributional patterns would probably not change by very much.

### ***Current-Law Taxation of Social Security Benefits***

The simulation population is described in table 1. Altogether, there are about 108 million families included (column 1). For the tabulations, a set of income categories has been defined that divides the overall population of families into 10 groups of family income (column 1).<sup>15</sup>

Average family income rises by decile (column 2) as would be expected. Because of the progressive rate structure of the income tax, income taxes rise by decile even faster than income, so that the income tax as a percent of family income (column 3) also rises by decile.

About 28 million families, or 26 percent of all families, contain persons receiving Social Security benefits (columns 4 and 5). These beneficiary families are not evenly distributed by family income, but are disproportionately represented in the second through sixth deciles of family income (column 4). Comparing the income tax of beneficiary families (column 8) with that of families in the whole population (column 3), it can be seen that beneficiary families tend to pay lower income taxes than other families within the same family income decile, particularly in the lower deciles. This is because beneficiary families tend to have tax filers aged 65 or older, who qualify for larger standard deductions, and because a large portion of beneficiary income, particularly in the lower deciles, is composed of Social Security benefits, some or all of which is exempt from the income tax.

The 28 million beneficiary families contain about 52 million persons (tabulation not shown), of whom about 37 million are receiving Social Security ben-

efits. (Because the CPS does not contain income information for children under age 15, many child beneficiaries in the population are not tabulated as beneficiaries in the CPS.) The remaining non-beneficiaries in the beneficiary families are either married to beneficiaries or are other family members living with beneficiaries.

Tabulations not shown here indicate that about 75 percent of the 28 million beneficiary families are beneficiaries living on their own, that is, they live in Census families that include no persons other than beneficiaries or spouses of beneficiaries. The remaining 25 percent have other relatives in their Census family, typically either parents or children of the beneficiaries. In one-third of these cases the beneficiaries or spouses of beneficiaries are the only income recipients in the family; in the other two-thirds, income is received by other family members.

This last group, beneficiaries living in families with other income recipients, is important to keep in mind in interpreting the tables in this article. Although the group makes up about 17 percent of all beneficiary families, it also makes up about 40 percent of beneficiary families in the top two deciles. On income tax returns, these beneficiaries will include only their own incomes, which are often quite low even though the income of the Census family as a whole is high. Because the taxation thresholds look only at the incomes of persons in the tax-filing unit, these beneficiary units can have non-taxable benefits even when the Census family income puts them into one of the upper deciles in the tables. A tabulation of income tax returns, classifying them by AGI rather than by family income, would show a greater percentage of high-income units paying a tax on their benefits than is shown in this article, in which the tabulation is by Census family, classifying by family income.

One final group of beneficiary families is singled out in table 1—those in which the family income is composed solely of Social Security benefit income. Almost 10 percent of beneficiary families are in this group (column 9, compared with column 5). Half of them are in the

second decile, and 98.5 percent are in the lowest four deciles. None of these families pays income taxes under current law (column 11). (The characteristics of the units in the upper middle deciles, who have extremely high benefits reported on the CPS, are not known. These units might have several related beneficiaries, or may be receiving benefit adjustments from earlier years, or perhaps are simply misreporting the amount of benefits.)

The results from simulating the current-law taxation of benefits are shown in table 2. According to column 3, 20 percent of families with Social Security benefits pay taxes on their benefits. No families in the bottom four deciles, and very few in the fifth decile, pay a tax on benefits. Above the fifth decile—above the median family income—the proportion of families paying taxes on their benefits increases with income up to the highest incomes. In the top decile, four-fifths of beneficiary families pay taxes on their benefits. A tabulation not shown here verifies that if beneficiaries living with other family members are excluded from the tabulation, almost all remaining beneficiary families in the top decile are taxed on their benefits.

According to column 9, the average increase in income tax attributable to the taxation of benefits is \$213, averaged over all beneficiary families, even those not paying a tax on benefits. Taken only over those families paying a tax on benefits (column 7) the average is \$1,064. The average tax on benefits rises with family income in the taxed deciles whether the average is taken over affected families (column 7) or over all beneficiary families (column 9).

Column 11 in table 2 gives the tax change for beneficiary families as a percent of disposable income, where disposable income is defined as expanded family income minus the Federal personal income tax and any employee or self-employment Social Security contributions. (Earned income credits for eligible families are added to disposable income.)

Comparing this ratio of tax change to disposable income as income increases from decile to decile gives an indication of the degree of progressivity of the benefit tax.<sup>16</sup> In this case, the tax as a percent

Table 1.—Simulation population, 1994

Decile by expanded family income	All families				All families with benefits				Families with only benefit income		
	Number (in thousands) (1)	Average expanded family income (2)	Income tax as percent of expanded family income (3)	Percent with benefit (4)	Number (in thousands) (5)	Average income (6)	Average benefit (7)	Income tax as percent of expanded family income (8)	Number (in thousands) (9)	Average benefit (10)	Income tax as percent of expanded family income (11)
Total .....	107,557	\$40,566	11.5	25.6	27,524	\$33,395	\$11,271	7.8	2,618	\$9,784	0.0
1: \$1-\$7,213 .....	9,510	\$4,421	.1	21.9	2,079	\$5,558	\$4,601	.0	731	\$5,197	.0
2: \$7,213-\$12,098 .....	10,754	9,626	1.5	41.0	4,410	9,591	7,982	.0	1,315	9,297	.0
3: \$12,098-\$17,389 .....	10,758	14,736	3.1	35.8	3,854	14,709	10,271	.2	371	14,272	.0
4: \$17,389-\$23,353 .....	10,756	20,328	4.6	32.7	3,521	20,259	11,972	1.0	163	19,823	.0
5: \$23,353-\$29,672 .....	10,754	26,413	6.0	28.2	3,030	26,375	12,660	2.2	26	25,434	.0
6: \$29,672-\$37,134 .....	10,758	33,180	7.2	26.8	2,880	33,134	13,633	3.3	10	31,787	.0
7: \$37,134-\$45,801 .....	10,755	41,217	8.7	21.2	2,275	41,099	13,412	5.3	2	41,195	.0
8: \$45,801-\$58,337 .....	10,754	51,640	9.7	18.9	2,034	51,616	13,814	7.2	(1)	(1)	(1)
9: \$58,337-\$79,467 .....	10,755	67,543	11.7	15.1	1,625	67,867	13,328	9.6	(1)	(1)	(1)
10: \$79,467 or more .....	10,758	137,190	18.0	16.8	1,807	140,302	14,246	16.8	(1)	(1)	(1)

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

Table 2.—Effect of current-law taxation of benefits, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions) (1)	Percent of column total (2)	Taxed on benefits (3)	With change in tax		Number of families (in thousands) (6)	Average change in income tax (7)	Change in income tax as percent of benefit (8)	Average change in income tax (9)	Change in income tax as percent of benefit (10)	Change in income tax as percent of disposable income (11)	Change in income tax as percent of disposable income (12)
				Newly taxed (4)	Already taxed (5)							
Total .....	\$5,857	100.0	20.0	20.0	0.0	5,503	\$1,064	8.0	\$213	1.9	0.70	0.16
1: \$1-\$7,213 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
2: \$7,213-\$12,098 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
3: \$12,098-\$17,389 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
4: \$17,389-\$23,353 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
5: \$23,353-\$29,672 .....	6	.1	2.1	2.1	.0	65	91	2.1	2	.0	.01	.00
6: \$29,672-\$37,134 .....	100	1.7	16.8	16.8	.0	484	206	2.3	35	.3	.11	.03
7: \$37,134-\$45,801 .....	465	7.9	43.2	43.2	.0	982	474	4.2	205	1.5	.54	.12
8: \$45,801-\$58,337 .....	964	16.5	65.3	65.3	.0	1,328	726	5.1	474	3.4	1.01	.21
9: \$58,337-\$79,467 .....	1,469	25.1	71.6	71.6	.0	1,163	1,263	8.9	904	6.8	1.52	.25
10: \$79,467 or more .....	2,854	48.7	82.0	82.0	.0	1,482	1,926	12.7	1,580	11.1	1.38	.25

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

of disposable income rises or does not fall over all intervals except between the ninth and tenth deciles; the tax on the tenth decile is below that on the ninth decile but above that on the eighth decile. Hence, the current-law tax on benefits can be considered as progressive from the middle deciles almost to the top.<sup>17</sup>

Progressivity measured over beneficiary families does not necessarily extend to progressivity measured over all families, since above the second decile the probability of receiving benefits generally decreases with income (table 1, column 4). The fact that lower income families are more likely to receive benefits reduces the overall progressivity of the tax on benefits. Column 12 of table 2 indicates, however, that even taken over all families in the population, the current taxation of benefits is progressive except between the ninth and tenth deciles. The top three deciles pay 90 percent of the tax (column 2), with the seventh decile paying another 8 percent and the sixth decile paying the remaining 2 percent. The fifth decile pays only a trace.

The analysis of progressivity given above is an analysis from the perspective of vertical equity. It is important to remember, when interpreting these and later tables, that there are other criteria than vertical equity that must be taken into account; it is not necessarily true that the only desirable changes in benefit taxation are those that increase progressivity. From the perspective of horizontal equity, the simulation of the benefit taxation by income decile gives an indication of the size of the horizontal inequities at each income level that are corrected by the tax change, assuming that the tax change is equitable. As table 2 indicates, the changes introduced by the current-law taxation of benefits are particularly large in the top two deciles, whether measured in dollar amounts (column 1) or relative to family disposable income (column 11 or 12).

Because corrections for horizontal equity are likely to vary by income level, any such tax changes are likely to introduce changes in the progressivity of taxation. These changes in progressivity, if undesirable, need not rule out the improvement in horizontal equity, since the

changes in vertical equity can be corrected by changes in tax brackets and tax rates. In practice, the tax rates and brackets cannot be fine-tuned every time a tax change is made, and the tabulation of the distribution of tax-rate changes, like those in columns 11 and 12 of table 2, serves the purpose of monitoring the resulting changes in the vertical distribution of tax rates. In conjunction with tabulations of the existing tax structure, like those in columns 3 and 8 of table 1, these distributions help policymakers determine whether the changes in the vertical distribution, if they are in undesirable directions, are large enough to trigger compensating changes in, for example, the special standard deduction for aged filers.

A tabulation not shown here indicates that the 5.5 million families affected by the tax on benefits contain almost 8 million beneficiaries, or 22 percent of all beneficiaries in the simulation population. The proportion of affected beneficiaries (22 percent) is slightly higher than the proportion of affected beneficiary families (20 percent) because families containing two beneficiaries tend to have higher incomes and a greater likelihood of paying taxes on benefits than families containing only one beneficiary.

### ***85-Percent Inclusion, Current-Law Taxation Thresholds***

Perhaps the most common proposal for changing the taxation of benefits is to raise to 85 percent from 50 percent the proportion of benefits includable in gross taxable income, while maintaining the current-law taxation thresholds. The 85-percent inclusion level, as was mentioned in the section "Background and Proposals for Reform," is derived by excluding from taxation a portion attributable to taxable employee contributions.

We will simulate two variants of that proposal here, differing in their phase-in provision for incomes near the taxation threshold. (Chart 2 demonstrates these variants.) The first, the "85-percent phase-in," calculates the excess of modified AGI over the threshold the same way as under current law, but takes 85 percent of the excess rather than 50 percent. For all taxpayers, this means

that the amount of Social Security benefits included in gross taxable income under current law will be increased by 70 percent under the proposal (because 85 percent is 70 percent larger than 50 percent). Taxpayers who include no benefits under current law will include no benefits under the proposal, while taxpayers who include the full 50 percent of benefits under current law will include a full 85 percent of benefits under the proposal. This proposal is said to have an "85-percent phase-in rate" because for taxpayers whose incomes are such that some benefits, but not the full 85 percent of benefits, are included, each additional dollar of non-benefit income will increase includable benefits by 85 cents. Gross taxable income for these taxpayers will go up by \$1.85 for each additional dollar of non-benefit income, so that the marginal tax rate will be 1.85 times higher than it would have been without benefit taxation.<sup>18</sup>

The results of the simulation are given in table 3. The percentage of beneficiary families taxed remains at 20 percent (column 3), as under current law. The average affected family pays an additional tax of \$796 (column 7), an increase of 75 percent over the current-law tax on benefits of \$1,064 (table 2, column 7). (Although the includable benefit will increase by 70 percent, the tax can increase by a larger percentage because for some taxpayers part of the new addition to taxable income can be in a higher tax bracket than the increment to taxable income from the current-law taxation of benefits.) For beneficiary families as a whole, the tax increase averages only \$159 (column 9), equal to about 1.4 percent of benefits (column 10). As a percent of disposable income, the additional tax averages 0.5 percent for beneficiary families, rising from zero for deciles below the fifth to a peak of 1.2 percent in the ninth decile (column 11). The bottom four deciles would pay nothing, the next three deciles would pay 10 percent (concentrated in the upper end of the range), and the top three deciles would pay 90 percent (column 2).

This pattern is very similar to that found under current law. The effect for most taxpayers will be roughly propor-

tional to the effect of current-law taxation of benefits, so that the proposal will have distributional effects roughly proportional to the distributional effects from current-law taxation of benefits. Exactly the same numbers of families and persons are affected as under current law.

In the other variant of 85-percent inclusion simulated here, the "50-percent phase-in," modified AGI would be calculated by adding 85 percent of benefits, rather than 50 percent, to non-benefit AGI plus tax-free interest; and 50 percent, rather than 85 percent, of the excess of modified AGI over the tax threshold would be included in taxable gross income, up to a maximum, in both versions, of 85 percent of benefits. This variant has the advantage over the 85-percent phase-in of keeping marginal tax rates for beneficiaries with incomes near the taxation threshold down to the levels under current law. Under current law and this variant, marginal tax rates are held to 1.5 times the rate on the income tax schedule, while under the 85-percent phase-in marginal tax rates are 1.85 times the rate on the tax schedule. A beneficiary in the 15-percent bracket, in other words, would have an effective marginal tax rate under current law and under the 50-percent phase-in version simulated here of 22.5 percent, while under the 85-percent phase-in simulated in table 3, the effective marginal tax rate would be 27.75 percent.

The simulation results are shown in table 4. The percentage of beneficiary families paying a tax on benefits would rise from 20 percent under current law to 25 percent under the proposal (column 3).<sup>19</sup> Most of the effects of the proposal are in the form of an increase in taxes on those already paying a tax on benefits, rather than an increase in the number of families paying taxes on their benefits. Among the affected families, the additional tax would average \$663, equivalent to 4.8 percent of their benefits (columns 7 and 8). Among all beneficiary families the average additional tax is \$166, equal to 1.5 percent of benefits (columns 9 and 10). As a percent of disposable income, the additional tax averages 0.6 percent for beneficiary families, rising from zero for deciles below the fifth to a peak of 1.1 percent in the ninth decile

Chart 2.—The benefit taxation phase-in under 85-percent inclusion

Because different phase-in formulas can be applied, there is more than one way to increase the inclusion percentage to 85 percent. In the formula in chart 1, there are three occurrences of the value 0.5 (50 percent), which will here be denoted  $P_{max}$ ,  $P_{rate}$ , and  $P_0$ .  $P_{max}$  is the maximum proportion of includable benefit, 0.50 under current law and 0.85 under the proposal.  $P_0$  is the proportion of benefits added to non-Social-Security AGI to compare with the taxation threshold.  $P_{rate}$  is the "phase-in rate," the proportion of the excess over the threshold that is included. The formula in these terms is written:

$$\text{Includable Benefit} = \text{MIN}\{P_{max}B, \text{MAX}[0, P_{rate}(Y + TF + P_0B - T)]\}.$$

The formula can be divided into ranges by income:

If  $Y+TF \leq T - P_0B$ , then the Includable Benefit is 0.

If  $Y+TF \geq T + (P_{max}/P_{rate} - P_0)B$ , then the Includable Benefit is  $P_{max}B$ .

Otherwise, the Includable Benefit is  $P_{rate}(Y + TF + P_0B - T)$ .

For 85-percent taxation,  $P_{max}$  is set to 0.85 rather than 0.5. Under the "85-percent phase-in,"  $P_0$  would remain at 0.5, while  $P_{rate}$  would be increased to 0.85. Under the "50-percent phase-in,"  $P_0$  would be raised to 0.85, while  $P_{rate}$  would be left at 0.5. Both of these possibilities keep the phase-in of benefits centered on the taxation threshold. There are other possibilities not simulated here.

(column 11). The bottom four deciles would pay nothing, the next three deciles would pay 17 percent of the additional taxes (concentrated in the upper end of the range), and the top three deciles would pay 83 percent (column 2).

The tax increase under this proposal is predominantly an increase in taxes among those who are already paying taxes under current law. The first four deciles remain, as under current law, completely immune from benefit taxation, as do all those beneficiary families with no non-benefit income.

Comparing the 50-percent phase-in with the 85-percent phase-in, we find that the 50-percent phase-in increases taxes by about 4.4 percent more than the 85-percent phase-in (column 1, tables 3 and 4). In addition to the 20 percent of beneficiary families already paying taxes, all of whose taxes are increased (column 5, tables 3 and 4), there is an additional group of 5.1 percent of beneficiary families who become newly taxable on their benefits under the 50-percent phase-in but not under the 85-percent phase-in (col-

umn 4, tables 3 and 4). This group is heavily concentrated in the fifth through seventh deciles. The tax increase among beneficiary families (comparing columns 9 or 10 in tables 3 and 4) tends to be higher under the 50-percent phase-in in the fifth, sixth, and seventh deciles, about the same in the eighth decile, and lower in the ninth. (Taxpayers in the tenth decile, who are usually above the phase-in region under either variant, are affected about the same under either proposal.)<sup>20</sup>

### ***Elimination of Thresholds, 50-Percent Inclusion***

As mentioned in the opening section on background and proposals for reform, the original proposal for taxation of benefits by the 1979 Advisory Council on Social Security called for including 50 percent of benefits in taxable income, with no thresholds. That proposal could be achieved now by eliminating the current-law thresholds. Table 5 presents the results from simulating this policy change for 1994.<sup>21</sup> Under the proposal, 60 percent

Table 3.—85-percent inclusion, current thresholds, 85-percent phase-in, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions)	Percent of column total	Taxed on benefits	With change in tax		Number of families (in thousands)	Average change in income tax	Change in income tax as percent of benefit	Average change in income tax	Change in income tax as percent of benefit	Change in income tax as percent of disposable income	Change in income tax as percent of disposable income
				Newly taxed	Already taxed							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
Total .....	\$4,383	100.0	20.0	0.0	20.0	5,503	\$796	6.0	\$159	1.4	0.53	0.12
1: \$1-\$7,213 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
2: \$7,213-\$12,098 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
3: \$12,098-\$17,389 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
4: \$17,389-\$23,353 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
5: \$23,353-\$29,672 .....	4	.1	2.1	.0	2.1	65	63	1.5	1	.0	.01	.00
6: \$29,672-\$37,134 .....	76	1.7	16.8	.0	16.8	484	157	1.7	26	.2	.08	.02
7: \$37,134-\$45,801 .....	361	8.2	43.2	.0	43.2	982	367	3.3	159	1.2	.42	.10
8: \$45,801-\$58,337 .....	725	16.5	65.3	.0	65.3	1,328	546	3.8	356	2.6	.76	.15
9: \$58,337-\$79,467 .....	1,153	26.3	71.6	.0	71.6	1,163	992	7.0	710	5.3	1.19	.19
10: \$79,467 or more .....	2,063	47.1	82.0	.0	82.0	1,482	1,392	9.2	1,142	8.0	1.00	.18

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

of beneficiary families would be paying taxes on their benefits (column 3). Only 49 percent have a tax increase (column 4 plus column 5); the other 11 percent are beneficiaries already paying taxes under current law on the full 50 percent of benefits. Those families paying increased taxes would pay, on average, \$667 more in taxes (column 7), which would be equivalent to losing 5.1 percent of their Social Security benefits (column 8).

For beneficiary families as a whole, table 5 illustrates that the tax would rise an average of \$324, equal to 2.9 percent of benefits (columns 9 and 10). The implicit cut in benefits, as a percent of benefits, rises through the sixth decile and then falls—a pattern reinforced by the fact that many high-income families are already paying taxes on half their benefits. The additional taxes would reduce the disposable income of beneficiary families by, on average, 1.1 percent (column 11). The percentage reduction in disposable income increases with income up to the sixth decile, and then falls. Very

few families with incomes in the lowest two deciles would pay taxes on their benefits since their taxable incomes would still be too low to generate any tax payments. Many high-income families would also be unaffected since half their benefits are already included in taxable income. The burden of this policy change, therefore, would fall primarily on middle-decile families. The lowest three deciles would pay 7 percent of the additional taxes (almost all of it from the third decile), the middle four deciles would pay 73 percent, and the top three deciles would pay 20 percent (column 2).<sup>22</sup>

In summary, the effect of eliminating the taxation thresholds would be felt most by beneficiaries in the fourth through seventh deciles, increasing taxes by about 2 percent of disposable income in these deciles. The effect falls off above and below these middle deciles, so that the overall tax change on beneficiary families is about 1 percent of disposable income. Almost 4 percent of those beneficiary families with only benefit income (tabu-

lation not shown) would pay increased taxes under the proposal, although none of these would be in the bottom two deciles. (Many of the benefits-only families that do pay more taxes are the beneficiaries in the upper middle deciles with extremely high-benefit incomes on the survey file.)

As was mentioned in the discussion of the current-law taxation of benefits, the vertical distribution of the tax impact is not necessarily the best criterion for judging a tax change that is introduced on grounds of horizontal equity. Part of the strength of the relative impact on the middle deciles in this proposal is attributable to the taxation of benefits having been introduced in two stages. In the first stage, taxation was introduced for the upper deciles, with the middle deciles partly protected by the taxation thresholds. In the second stage, taxation is introduced to the middle deciles by removing the threshold. Looking only at the second stage, the relative impact falls, not surprisingly, on the middle deciles. Looking

Table 4.—85-percent inclusion, current thresholds, 50-percent phase-in, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions) (1)	Percent of column total (2)	Taxed on benefits (3)	With change in tax		Number of families (in thousands) (6)	Average change in income tax (7)	Change in income tax as percent of benefit (8)	Average change in income tax (9)	Change in income tax as percent of benefit (10)	Change in income tax as percent of disposable income (11)	Change in income tax as percent of disposable income (12)
				Newly taxed (4)	Already taxed (5)							
Total .....	\$4,574	100.0	25.1	5.1	20.0	6,897	\$663	4.8	\$166	1.5	0.55	0.13
1: \$1-\$7,213 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
2: \$7,213-\$12,098 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
3: \$12,098-\$17,389 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
4: \$17,389-\$23,353 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
5: \$23,353-\$29,672 .....	35	.8	11.5	9.3	2.1	348	102	1.0	12	.1	.05	.01
6: \$29,672-\$37,134 .....	193	4.2	33.7	16.9	16.8	970	199	1.7	67	.5	.21	.06
7: \$37,134-\$45,801 .....	533	11.7	63.5	20.3	43.2	1,443	369	2.7	234	1.7	.61	.14
8: \$45,801-\$58,337 .....	746	16.3	70.2	4.9	65.3	1,428	523	3.6	367	2.7	.78	.16
9: \$58,337-\$79,467 .....	1,041	22.8	74.2	2.6	71.6	1,205	864	6.0	641	4.8	1.08	.17
10: \$79,467 or more .....	2,025	44.3	83.1	1.1	82.0	1,502	1,348	8.9	1,121	7.9	.98	.18

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

Table 5.—50-percent inclusion, no thresholds, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions) (1)	Percent of column total (2)	Taxed on benefits (3)	With change in tax		Number of families (in thousands) (6)	Average change in income tax (7)	Change in income tax as percent of benefit (8)	Average change in income tax (9)	Change in income tax as percent of benefit (10)	Change in income tax as percent of disposable income (11)	Change in income tax as percent of disposable income (12)
				Newly taxed (4)	Already taxed (5)							
Total .....	\$8,923	100.0	59.9	39.9	8.7	13,368	\$667	5.1	\$324	2.9	1.07	0.24
1: \$1-\$7,213 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
2: \$7,213-\$12,098 .....	20	.2	3.6	3.6	.0	158	127	2.2	5	.1	.05	.02
3: \$12,098-\$17,389 .....	610	6.8	48.4	48.4	.0	1,864	327	3.4	158	1.5	1.08	.40
4: \$17,389-\$23,353 .....	1,203	13.5	62.3	62.3	.0	2,192	549	5.0	342	2.9	1.71	.60
5: \$23,353-\$29,672 .....	1,681	18.8	84.1	82.0	1.7	2,535	663	5.2	555	4.4	2.17	.66
6: \$29,672-\$37,134 .....	2,132	23.9	87.9	71.1	14.5	2,465	865	6.0	740	5.4	2.34	.68
7: \$37,134-\$45,801 .....	1,514	17.0	89.7	46.6	29.4	1,728	876	5.8	666	5.0	1.74	.40
8: \$45,801-\$58,337 .....	1,013	11.4	91.7	26.4	38.4	1,318	769	4.7	498	3.6	1.06	.22
9: \$58,337-\$79,467 .....	477	5.3	94.7	23.1	19.4	691	690	4.4	294	2.2	.49	.08
10: \$79,467 or more .....	272	3.1	96.3	14.3	8.7	416	655	4.6	151	1.1	.13	.02

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

at both stages in combination, the upper deciles bear a more proportionate share of the change. Nevertheless, even in the combined form, the tax on benefits falls somewhat more heavily, measured in proportion to income, on the middle deciles than on the upper. The implication is that the middle deciles benefited most, relative to income, from the nontaxation of benefits prior to 1984 and will therefore lose relatively more from the introduction of benefit taxation. From the perspective of some tax analysts, the middle deciles should lose more, because they are the ones benefiting more from an unfair tax advantage. But if this relative impact on the middle deciles is felt to be undesirable, it should be remembered that the thresholds that protect the middle deciles are providing less protection as time goes by, and that eventually the impact of the current-law taxation of benefits will approach that of the elimination of thresholds shown here. This issue will be discussed a little more in the conclusion.

### ***Other Proposals for the Taxation of Benefits***

In this section, several other alternatives for the taxation of benefits will be discussed. The first one will treat 85-percent inclusion with no taxation thresholds, a combination of the proposals simulated in the preceding two sections. The next two sections will consider two proposals that would retain 50-percent inclusion but would alter the thresholds: the first would effectively increase the thresholds by indexing them, and the second would reduce but not eliminate them.

#### ***85-Percent Inclusion, No Thresholds***

The rationale behind 85-percent inclusion, the analogy with pensions, if carried to its logical conclusion, would call also for an elimination of the taxation thresholds, since pension benefits are not protected from taxation by any thresholds. This section simulates such a proposal. Although this reform would appear to combine the two reforms already discussed, its effect on the distribution of income is not a simple addition of the

effects of these reforms. For families already above the taxation thresholds, it raises the percentage taxation from 50 percent to 85 percent, like the proposal given in the section on 85-percent inclusion, and for families below the current-law threshold it would include their benefits in taxable income, like the proposal in the section that looks at elimination of thresholds. But a third component is also now present for those families below the threshold: their benefits, newly included in taxable income, are 85-percent included rather than 50-percent included. The distributional effect of this plan is likely to be similar to that of eliminating the thresholds: it will primarily affect middle-decile families, but to an even larger extent than simply eliminating the thresholds.

Table 6 presents the results from simulating this reform. Compared with the policy of only eliminating the income thresholds (table 5), more beneficiary families would have a tax increase, 70 percent versus 49 percent (column 4 plus column 5), and the tax increase as a percent of disposable income would be larger, 2.6 percent of beneficiary-family disposable income versus 1.1 percent (column 11). The percentage reduction in beneficiary-family disposable income would increase with income up to the fifth and sixth deciles and then decrease. The percentage reduction in disposable income measured over all families, rather than just beneficiary families, would be largest at a slightly lower level, in the fourth decile (column 12). Of the aggregate additional taxes, 8 percent would be paid by the lowest three deciles, 60 percent by the middle four deciles, and 32 percent by the upper three deciles (column 2).

This proposal would make inroads on the taxation of families with only benefit income (tabulation not shown). Twenty-two percent of these families would be affected, with many of the affected families coming from the second and third deciles. Although no families in the first decile are affected, 19 percent of the second decile families are. In this regard, the 85-percent proposal differs significantly from the 50-percent inclusion proposal, since under 50-percent inclu-

sion none of the second-decile benefits-only families—the decile containing half of the benefits-only families—is affected.

### ***Indexed Thresholds, 50-Percent Inclusion***

The real value of the income thresholds, which are specified as fixed dollar amounts, has been decreasing ever since Social Security benefits were first taxed in 1984. Even without inflation, a rising trend in real incomes would push an increasing proportion of the beneficiary population over the taxation thresholds. Inflation, coupled with the non-indexation of the thresholds, ensures that an increasing proportion of families will be pushed over the thresholds even without real growth in incomes. Our simulations suggest that the percentage of families paying taxes on their benefits has more than doubled, from 8.4 percent of families with benefits in 1984 to 20 percent of such families in 1994. This growth will continue. We estimate<sup>23</sup> that by the turn of the century 31 percent of families with benefits will be paying taxes on their benefits under current-law provisions. Although this is still short of the 60 percent of such families that we estimate would be paying taxes in 1994 if the thresholds were eliminated, the trend is clear: as nominal incomes rise relative to the fixed taxation thresholds, the distribution of the impact of benefit taxation will resemble more and more the distribution that would result from benefit taxation with no thresholds.

If the benefit taxation thresholds had been indexed since 1984 using the same procedures that have been used to index the tax brackets and other dollar amounts in the income tax computations, then the income taxes paid on the benefits would be smaller for many beneficiary families now taxable, and some families with taxable benefits under current law would not have had taxable benefits. Table 7 gives the results for a simulation of inflation-indexed thresholds in 1994.<sup>24</sup> The percentage of beneficiary families with taxed benefits would fall from 20 percent under current law to 11 percent under the proposal (column 3). In addition to the 9 percent of beneficiary families whose

Table 6.—85-percent inclusion, no thresholds, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions) (1)	Percent of column total (2)	Taxed on benefits (3)	With change in tax		Number of families (in thousands) (6)	Average change in income tax (7)	Change in income tax as percent of benefit (8)	Average change in income tax (9)	Change in income tax as percent of benefit (10)	Change in income tax as percent of disposable income (11)	Change in income tax as percent of disposable income (12)
				Newly taxed (4)	Already taxed (5)							
Total .....	\$22,080	100.0	69.8	49.8	20.0	19,211	\$1,149	9.0	\$802	7.1	2.65	0.60
1: \$1-\$7,213 .....	0	.0	.6	.6	.0	12	31	1.3	0	.0	.00	.00
2: \$7,213-\$12,098 .....	178	.8	20.7	20.7	.0	912	195	2.3	40	.5	.42	.18
3: \$12,098-\$17,389 .....	1,535	7.0	61.7	61.7	.0	2,377	646	6.4	398	3.9	2.72	1.02
4: \$17,389-\$23,353 .....	2,733	12.4	85.4	85.4	.0	3,007	909	7.4	776	6.5	3.89	1.36
5: \$23,353-\$29,672 .....	3,409	15.4	90.9	88.8	2.1	2,755	1,237	9.5	1,125	8.9	4.40	1.35
6: \$29,672-\$37,134 .....	4,037	18.3	94.0	77.2	16.8	2,708	1,491	10.7	1,402	10.3	4.43	1.29
7: \$37,134-\$45,801 .....	3,090	14.0	94.2	51.0	43.2	2,142	1,443	10.6	1,358	10.1	3.55	.81
8: \$45,801-\$58,337 .....	2,534	11.5	94.9	29.6	65.3	1,930	1,313	9.3	1,246	9.0	2.66	.54
9: \$58,337-\$79,467 .....	2,045	9.3	97.8	26.2	71.6	1,589	1,287	9.6	1,258	9.4	2.11	.34
10: \$79,467 or more .....	2,518	11.4	98.4	16.4	82.0	1,778	1,417	9.9	1,394	9.8	1.22	.22

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

benefits would no longer be taxed (20 percent minus 11 percent), there would be another 4 percent of families whose taxes would be reduced, so that a total of 13 percent of beneficiary families would see a tax reduction (column 5). (Seven percent would have no change in tax.) For the affected families, the tax reduction averages \$532, equivalent to 3.8 percent of their benefits (columns 7 and 8). Because no one in the bottom four deciles is taxed under current law, no one in those deciles is affected by the reform. All families in the fifth and sixth deciles who are taxed under current law would no longer be taxed (column 3). In the top four deciles, most of the tax relief, both in terms of percent of beneficiary families with a decrease in tax (column 5) and in terms of aggregate dollar amounts (column 1) or average amounts over beneficiary families (column 9), takes place in the seventh, eighth, and ninth deciles, which together account for 85 percent of the decrease in aggregate taxes (table 7, column 2). Measured relative to dispos-

able income, the tax reduction is 0.2 percent over beneficiary families, rising from zero in the fifth decile to a peak of 0.8 percent in the eighth decile, then falling back almost to zero in the tenth decile (column 11). The threshold-indexing proposal, by and large, helps beneficiary families in the upper deciles, but not the very top levels. Conversely, the lack of indexing of the thresholds has hurt these families the most; as the years go by, however, the impact of nonindexing should shift to lower deciles.

### 50-Percent Inclusion With Reduced Thresholds

Table 8 presents the results of lowering the thresholds to \$18,000 for joint filers and \$12,000 for single filers. (These are the thresholds that were used for the taxation of unemployment compensation from 1983 until the unemployment compensation thresholds were eliminated after 1986.) The number of families pay-

ing taxes on their benefits would double, to 40 percent (column 3). Most of the affected families would be in the middle deciles. Whether measured in proportion to benefits (column 10) or in proportion to disposable incomes (column 11), the heaviest additional taxes on beneficiary families would fall on the sixth and seventh deciles. In the seventh decile, the additional tax for beneficiary families amounts to 2.9 percent of benefits; over beneficiary families as a whole the additional tax is 1.2 percent of benefits (column 10). As a percent of disposable income, the additional tax declines for the highest deciles because many of these beneficiaries have incomes high enough above the current taxation thresholds to include the maximum 50 percent of benefits in their gross taxable income. The bottom three deciles pay less than 0.5 percent of the aggregate additional taxes, the middle four deciles pay 73 percent, and the top three pay 26 percent (column 2). No benefits-only families are affected (tabulation not shown).

Table 7.—50-percent inclusion, indexed thresholds, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions) (1)	Percent of column total (2)	Taxed on benefits (3)	With change in tax		Number of families (in thousands) (6)	Average change in income tax (7)	Change in income tax as percent of benefit (8)	Average change in income tax (9)	Change in income tax as percent of benefit (10)	Change in income tax as percent of disposable income (11)	Change in income tax as percent of disposable income (12)
				Newly taxed (4)	Already taxed (5)							
Total .....	-\$1,921	100.0	10.8	0.0	13.1	3,609	-\$532	-3.8	-\$70	-0.6	-0.23	-0.05
1: \$1-\$7,213 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
2: \$7,213-\$12,098 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
3: \$12,098-\$17,389 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
4: \$17,389-\$23,353 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
5: \$23,353-\$29,672 .....	-6	.3	.0	.0	2.1	65	-91	-2.1	-2	.0	-.01	.00
6: \$29,672-\$37,134 .....	-100	5.2	.0	.0	16.8	484	-206	-2.3	-35	-3	-.11	-.03
7: \$37,134-\$45,801 .....	-426	22.2	6.9	.0	42.4	964	-442	-3.9	-187	-1.4	-.49	-.11
8: \$45,801-\$58,337 .....	-712	37.0	24.0	.0	57.6	1,171	-607	-3.9	-350	-2.5	-.75	-.15
9: \$58,337-\$79,467 .....	-498	25.9	57.5	.0	42.0	683	-729	-4.1	-306	-2.3	-.51	-.08
10: \$79,467 or more .....	-180	9.4	76.9	.0	13.4	242	-744	-4.1	-100	-.7	-.09	-.02

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

Table 8.—50-percent inclusion, reduced thresholds, 1994

Decile by expanded family income	Aggregate change in income tax		Percent of all families with benefits			Families with change in tax			All families with benefits			All families
	Amount (in millions) (1)	Percent of column total (2)	Taxed on benefits (3)	With change in tax		Number of families (in thousands) (6)	Average change in income tax (7)	Change in income tax as percent of benefit (8)	Average change in income tax (9)	Change in income tax as percent of benefit (10)	Change in income tax as percent of disposable income (11)	Change in income tax as percent of disposable income (12)
				Newly taxed (4)	Already taxed (5)							
Total .....	\$3,747	100.0	40.3	20.3	8.4	7,893	\$475	3.6	\$136	1.2	0.45	0.10
1: \$1-\$7,213 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
2: \$7,213-\$12,098 .....	0	.0	.0	.0	.0	(1)	(1)	(1)	0	.0	.00	.00
3: \$12,098-\$17,389 .....	16	.4	6.1	6.1	.0	235	69	1.1	4	.0	.03	.01
4: \$17,389-\$23,353 .....	261	7.0	32.1	32.1	.0	1,130	231	2.6	74	.6	.37	.13
5: \$23,353-\$29,672 .....	602	16.1	50.5	48.3	1.7	1,516	397	3.9	199	1.6	.78	.24
6: \$29,672-\$37,134 .....	986	26.3	69.0	52.2	14.5	1,921	513	3.9	342	2.5	1.08	.32
7: \$37,134-\$45,801 .....	898	24.0	75.6	32.4	29.2	1,401	641	4.2	395	2.9	1.03	.24
8: \$45,801-\$58,337 .....	648	17.3	78.6	13.4	37.8	1,040	623	3.5	319	2.3	.68	.14
9: \$58,337-\$79,467 .....	238	6.4	81.4	9.8	18.1	454	525	2.9	147	1.1	.25	.04
10: \$79,467 or more .....	97	2.6	86.4	4.3	6.5	197	492	2.9	53	.4	.05	.01

<sup>1</sup>No data in cell.

Note: Deciles are calculated over whole population, including non-aged, non-beneficiary families. Families with zero or negative income are included in total but not in lowest decile.

Source: STATS simulation on 3/92 CPS projected to 1994.

## Conclusion

We conclude by summarizing some of the patterns among the various plans. To simplify the comparisons, only those plans using the current-law thresholds or no thresholds will be compared. All plans with thresholds use the 50-percent phase-in. (The three plans left out of this summary are the 85-percent phase-in plan, the indexed threshold plan, and the reduced threshold plan.) As mentioned above, four plans have been added to this summary discussion for which detailed tables have not been presented in this article: 65-percent inclusion, with or without thresholds, and 100-percent inclusion, with or without thresholds. These plans not only represent alternative reforms (the 65-percent plan representing inclusion percentages adjusted for inflation, and the 100-percent plan representing the maximum inclusion percentage), but they help to illuminate the patterns by interpolating between and extrapolating beyond the 50-percent and 85-percent inclusion percentages.

Table 9 gives the percent of beneficiary families who would pay a tax on benefits under each proposal. As would be expected, eliminating the thresholds greatly increases the number of affected families; raising the inclusion percentage has a much smaller effect.

Table 10 shows the tax on benefits as a percent of disposable income—the amounts are for the population of beneficiary families. The columns labelled “additional tax” give the added tax, as a percent of disposable income, corresponding to column 11 of the appropriate tables earlier in the article. The columns labelled “total tax on benefits” add to this amount the 0.70 percent of beneficiary-

family disposable income that is already taxed under current law. Again, whether looking at either the change in tax or the total tax, the elimination of thresholds has a larger effect, even under 50-percent inclusion, than any increase in the inclusion percentage.

The effects of the various proposals differ markedly by income level. For the discussion here, we will look only at the first, fifth, and tenth deciles. The first decile is unaffected by benefit taxation under all proposals except the most extreme, 100-percent inclusion with no thresholds, under which the first decile pays a tax of 0.1 percent of disposable income. The fifth decile's taxes are shown in table 11. This decile pays virtually no tax under current law, and it is not much affected by any of the proposals that keep the current thresholds while raising the inclusion percentage, but it is increasingly affected by higher inclusion percentages if the thresholds are eliminated. This table clearly shows the non-additive character of the combination proposals for beneficiary families in the middle deciles: moving from current law to 85-percent inclusion increases taxes by 0.05 percent of income, and moving from current law to no thresholds increases

taxes by 2.2 percent of income, but a combination move to 85-percent inclusion with no thresholds increases taxes by 4.4 percent of income, far more than a simple sum of the separate effects.

The tenth decile's taxes are shown in table 12. Beneficiaries in this decile, many of whom already have a full 50 percent of benefits included in taxable income, are less affected by eliminating the thresholds than by increasing the inclusion percentage. This table demonstrates the more nearly additive character of combination proposals in the upper deciles: moving from 50-percent to 85-percent inclusion increases taxes by 1.0 percent of income, moving from current thresholds to no thresholds increases taxes by 0.1 percent of income, and a combination of the two increases taxes by 1.2 percent of income, not much more than the sum of the separate effects.

In summary, under current law most of the tax from the income taxation of benefits is paid by the upper deciles. Increasing the inclusion percentage by itself would mainly have the effect of increasing the tax on these upper deciles. Eliminating the thresholds by itself would mainly have the effect of increasing the tax on the middle deciles, and would have

Table 10.—Income tax on benefits as a percent of beneficiary-family disposable income, 1994

[In percents]

Inclusion percentage	Current thresholds		No thresholds	
	Additional tax	Total tax on benefits	Additional tax	Total tax on benefits
50 .....	0	0.70	+1.07	1.77
65 .....	+0.23	0.93	+1.73	2.43
85 .....	+0.55	1.25	+2.65	3.35
100 .....	+0.79	1.49	+3.35	4.05

Table 11.—Taxation of benefits as a proportion of beneficiary-family disposable income, fifth decile, 1994

[In percents]

Inclusion percentage	Current thresholds		No thresholds	
	Additional tax	Total tax on benefits	Additional tax	Total tax on benefits
50 .....	0	0.01	+2.17	2.18
65 .....	+0.01	0.02	+3.12	3.13
85 .....	+0.05	0.06	+4.40	4.41
100 .....	+0.11	0.12	+5.35	5.36

Table 9.—Percent of beneficiary families with taxed benefit, 1994

[In percents]

Inclusion percentage	Current thresholds		No thresholds	
	Current thresholds	No thresholds	Current thresholds	No thresholds
50 .....	20.0	59.9	20.0	59.9
65 .....	22.1	65.1	22.1	65.1
85 .....	25.1	69.8	25.1	69.8
100 .....	27.7	72.8	27.7	72.8

the further effect that the middle deciles would pay more of a tax on benefits, measured relative to income, than would the upper deciles. Combining the two changes, both increasing the inclusion percentage and eliminating the thresholds, would have about the same effect on the top deciles as merely increasing the inclusion percentage, but would have a compounded effect on the middle deciles.

Beneficiaries in the bottom two deciles are for the most part protected against taxation of benefits even if the thresholds are eliminated. (The most extreme proposal, 100-percent inclusion with no thresholds, would tax only a trace of income from beneficiaries in the bottom decile, and only 0.8 percent of income from beneficiaries in the second decile.) Families who receive no income other than benefits—most such families are in the bottom two deciles—are also immune from benefit taxation under current-law thresholds no matter what the inclusion percentage. If the thresholds are eliminated, the benefits-only families in the bottom two deciles would still be free of benefit taxation, but as the inclusion percentage is raised above 50 percent, some of these families become affected: at 85-percent inclusion none of the families in the bottom decile would be affected, but 19 percent of those families in the second decile would. At 100-percent inclusion the corresponding figures are 8 percent in the bottom decile and 28 percent in the second.

If the thresholds are eliminated, the middle deciles, as already noted, would pay the highest tax on benefits when measured relative to income, regardless of what the inclusion percentage is. Because retirement incomes are likely to rise in the future, due to real income

growth and inflation, the fixed taxation thresholds will protect fewer and fewer beneficiary families from taxation, so that ultimately the burden of taxation of benefits will fall most heavily on beneficiaries in the middle deciles even if the current thresholds are kept. Any proposal that does not index the benefit taxation thresholds, therefore, must ultimately face the question of whether it is appropriate to let such a tax fall most heavily on those deciles.

If the tax on benefits were proposed purely as a means of raising more revenue, then the relatively heavier taxation on the middle deciles might arouse opposition in the absence of evidence that the distribution of taxation is lighter than it should be on the middle deciles; but if the tax on benefits is considered a means of making the tax system more fair, then the taxation of the middle deciles might be more acceptable. The tax on benefits brings into the tax base a portion of each beneficiary's personal income—the excess of benefits over the already-taxed employee contributions—that has not yet been taxed. That this tax would affect the middle deciles the most merely means that these deciles have profited the most from leaving that income untaxed.

One other factor is worth considering in this regard. The decile classifications used in this article were determined by tabulating the incomes of all families in the population, not just the beneficiary families. If we made a classification according to the incomes of beneficiary families only, we would find that the beneficiary families in what have been called the middle deciles in this article (the fourth through seventh deciles of the general population) would be found in about the sixth through ninth deciles of

the beneficiary population. The taxes that fall most heavily on beneficiaries in the middle deciles, therefore, are taxes that fall on the sixth through ninth deciles of beneficiary families (that is, on the upper deciles with the exception of the top decile). It is likely that many of these families were in the upper deciles in the general population before they retired.

In light of these remarks, we can offer the following rough summary of the distributional effects of benefit taxation. The effects of those proposals that would keep the current-law taxation thresholds would fall most heavily, in the near term, on beneficiary families in the upper deciles. The effects of those proposals that would eliminate the thresholds, and in this group must be included the long-term effect of proposals that keep the current thresholds, would fall most heavily on beneficiary families in the middle deciles. These same families, however, are in the upper deciles of beneficiary families and are likely to have been in the upper deciles of the general population during their pre-retirement careers.

## Notes

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<sup>1</sup> This study confines itself to benefit taxation under the Federal personal income tax. The effects of State and local income taxes are not considered.

<sup>2</sup> Almost all participants in a recent conference on "Social Security and the Budget" argued in favor of increasing the taxation of Social Security benefits (Aaron 1990). These participants included several economists (Aaron, Blinder, and Shoven), a political scientist (Ornstein), a former Congressperson (Jones), and a former Commissioner of Social Security (Ball). There was less agreement, however, on the method of raising taxes on Social Security benefits (that is, whether to eliminate the income thresholds or to raise the proportion of benefits subject to taxation).

Table 12.—Taxation of benefits as a proportion of beneficiary-family disposable income, tenth decile, 1994

[In percents]

Inclusion percentage	Current thresholds		No thresholds	
	Additional tax	Total tax on benefits	Additional tax	Total tax on benefits
50 .....	0	1.38	+0.13	1.51
65 .....	+0.42	1.80	+0.60	1.98
85 .....	+0.98	2.36	+1.22	2.60
100 .....	+1.35	2.73	+1.71	3.09

<sup>3</sup> The 1983 reform specified that the portion of taxation revenues attributable to the taxation of benefits must be paid to the Social Security trust funds. However, this transfer of funds is not a necessary component of benefit taxation (Myers 1990). If further reforms of benefit taxation allow some or all of the resulting revenues to remain with the Treasury, then benefit taxation would become a source of reduction in the non-Social-Security deficit.

<sup>4</sup> Although Social Security is taxed more lightly than most pensions, pensions themselves are taxed more lightly than some other forms of income, raising further equity issues with regard to pension taxation. The history of and rationales behind the taxation of benefits and pensions will be discussed more extensively in a companion working paper (Pattison forthcoming).

<sup>5</sup> This is not exactly true, since the phase-in mechanism insures that beneficiaries with little or no other income will never include the full half of benefits in gross taxable income, no matter how low the threshold falls in real value. If non-benefit income is equal to the threshold, only 25 percent of the benefit is included rather than 50 percent. If non-benefit income is greater than the threshold, but less than the threshold plus half of benefits, then the taxable portion of benefits will be somewhere between 25 percent and 50 percent of benefits. The revenue gain will ultimately approach an amount that is smaller than what would be obtained from including half of all benefits, falling short by an amount that depends on how many beneficiaries have non-benefit income of less than half their benefits.

<sup>6</sup> Contributions from after-tax income are those that are not deducted from income in calculating taxable income for the personal income tax. A worker, for example, who makes \$20,000 a year in wages but pays 7.65 percent of that, or \$1,530, in Social Security payroll taxes, includes the whole \$20,000 in taxable income. But the employer also pays an employer's share of \$1,530 in contributions, which is not included in taxable income. Of the total payments by the employer, \$21,530, the employer's contribution of \$1,530 is said to come from "before-tax income," leaving \$20,000 of taxable income. The remaining employee portion of \$1,530 is said to come from "after-tax income."

<sup>7</sup> A 1990 survey of employees of State and local governments found that for employees in defined-benefit pension plans 25 percent were wholly financed by the employer. See Department of Labor (1992).

<sup>8</sup> These cohorts will reach age 65 in the next century. Similar inclusion rates calcu-

lated for current retirees would be well above 90 percent. The 85-percent figure is not calculated to recoup the excess of benefits over taxed contributions for current retirees.

<sup>9</sup> See Social Security Advisory Council (1979), Munnell (1982), and Myers (1989, 1990). The 83-percent inclusion percentage found among the earlier references corresponds to the 85-percent inclusion percentage now proposed. The differences are due to changing projection assumptions (Goss 1989). Although the application of an 85-percent inclusion percentage would extend one aspect of the tax treatment of pensions to that of Social Security, it cannot be said that the result would treat Social Security benefits the same as pensions. A full equalization of the tax treatment would require, among other things, a requirement that half of all pension contributions, including employer contributions, be included in employee incomes for the personal income tax. Given that half of Social Security contributions are taxable, while little or none of pension contributions are, pension contributions receive a tax deferral not given to Social Security contributions. For future retirees (but not for current retirees) it is quite possible that an 85-percent inclusion percentage for Social Security benefits could result in Social Security contributions and benefits being taxed more heavily than pension contributions and benefits. See Pattison (forthcoming).

<sup>10</sup> See Department of Treasury, 1984, Vol. 2, pp. 181-182.

<sup>11</sup> See Lindeman (1988). Senator Moynihan, in remarks introducing a proposal to raise the taxation percentage to 60 percent, indicated that the figure was chosen as the lower of two inflation-adjusted estimates: a 65-percent estimate by the Social Security Administration, and a 60- to 70-percent estimate by the Congressional Budget Office. See Congressional Record, November 1, 1991, p. S15807.

<sup>12</sup> The 65-percent inclusion proposal represents those proposals that would adjust the inclusion percentage for inflation. The 100-percent inclusion proposal represents a natural bound to proposals to tax benefits; some tax analysts have advocated simply treating Social Security benefits as fully taxable income without regard to past contributions. For detailed tables on these additional plans, see Pattison and Harrington (1993).

<sup>13</sup> Several other studies have estimated the distributional effects of taxing Social Security benefits. Chernick and Reschovsky (1985) and Sammartino and Kasten (1983) estimate the distributional effect of the current tax treat-

ment of Social Security benefits while Sammartino and Kasten (1983, 1985, 1988) and Wixon, Bridges, and Pattison (1987) estimate the distributional effects of a wide variety of possible changes to the current law including lowering the income thresholds and raising the proportion of benefits included in taxable income. These studies all look at the distributional effects across all cohorts in a given year. Boskin (1986) and Pellechio and Goodfellow (1983) present evidence on the effect of the current tax treatment of Social Security benefits on intergenerational equity. No attempt is made in this article to estimate the possible effects of benefit taxation on work incentives. Chernick and Reschovsky (1985), Sammartino and Kasten (1983), and Dye (1985) discuss these possible effects, but only Chernick and Reschovsky actually try to estimate the impact on labor supply by the elderly, finding the effect "negligible."

<sup>14</sup> A more complete description of the STATS model can be found in Wixon, Bridges, and Pattison (1987).

<sup>15</sup> Family income, in this article, is an "expanded family income," defined as total CPS income before taxes plus net realized capital gains. (Negative net capital gains are limited to a loss of not more than \$3,000 per tax unit, the same loss limitation applied to capital losses included in taxable income. Without this limitation, some of the tables would show a sprinkling of families with very low incomes but with taxes on their benefits.) This definition of expanded income includes some nontaxable income (Supplemental Security Income, Aid to Families with Dependent Children, and other public assistance, and untaxed interest, pensions, and Social Security benefits) and is therefore broader than the concept of AGI used by the Federal tax system. However, it still falls short of a truly comprehensive definition of income since it does not include unrealized capital gains and noncash income (for example, the rental value of owner-occupied housing).

<sup>16</sup> This is only one of several different measures of progressivity that could be used, the one corresponding to the measure that Musgrave and Thin (1948) call "residual income progression." Tabulations not shown here indicate that if pre-tax income rather than disposable income were used as the measure (corresponding to Musgrave and Thin's "average income progression") the percentages would differ slightly but the qualitative results would be the same. Both measures are interval measures of progressivity, not overall or global measures.

<sup>17</sup> The disposable income in the denominator of the progressivity measure in table 2 is defined as disposable income under the current-law taxation of benefits, the same denominator that will be used to measure changes away from current law in other tables in this article.

<sup>18</sup> As of the end of June 1993, the proposal for 85-percent inclusion of benefits by the Clinton administration uses the 85-percent phase-in formula.

<sup>19</sup> Beneficiary family income becomes taxable if AGI, plus tax-free interest, plus 50 percent of the benefit is less than the taxation threshold but AGI, plus tax-free interest, plus 85 percent of the benefit is more than the taxation threshold.

<sup>20</sup> The pattern in the effects can be predicted from the phase-in formulas: for beneficiaries in the phase-in region, the 50-percent phase-in will result in a higher tax than the 85-percent phase-in for beneficiaries with non-Social-Security AGI below the taxation threshold, but will result in a lower tax for beneficiaries with non-Social-Security AGI above the taxation threshold.

<sup>21</sup> For this and later no-threshold simulations, benefits are simply included in gross taxable income with no phase-in provision. No change is made in the provisions for the credit for the elderly, even though, with the elimination of the thresholds, there might be an overlap between those who are eligible for the credit and those who include benefits in taxable income. Recipients of the credit for the elderly can have an increase in the credit, since the credit is reduced by any nontaxable Social Security benefits. This increase in the credit is included in the simulated income tax.

<sup>22</sup> A small amount of the increase in income taxes from the removal of the taxation thresholds, estimated at less than 5 percent of the total increase in income taxes, is due to the loss of dependency exemptions in some multiple-unit families that claim beneficiaries as dependents. Among the tests for dependency is a requirement that the dependent's gross income, not including nontaxable Social Security benefits, be below the personal exemption amount (\$2,450 in the 1994 simulations). When the thresholds are eliminated, making all benefits taxable, some beneficiary dependents no longer pass this gross income test, and the tax filers claiming them as dependents lose an exemption and have an increase in income taxes as a result, even though the Social Security benefits themselves might remain untaxed. In tabulations not shown here, 3 percent of beneficiary families, or 1 percent

of all families, were found to have lost exemptions as a result of eliminating the thresholds; these families paid an average of \$400 more in taxes due to the lost exemptions.

<sup>23</sup> The estimate for the year 2000 used a simulation projection to the year 2000 similar to that to the year 1994 that was used for the other simulations in this article: the simulation was adjusted to reflect changes in the population age structure projected for the year 2000, and all nominal dollar amounts were changed to reflect projected inflation and real income growth. In the simulation of current-law benefit taxation in 2000, all families in the bottom three deciles would remain untaxed, as would all families receiving only benefit income.

<sup>24</sup> Thresholds were indexed using the price-indexing procedures used for other income tax parameters, but without rounding the final results. The indexed thresholds used in the simulation were \$46,415 for joint filers and \$36,262 for single filers.

## References

- Aaron, Henry J. 1990. "Social Security and the Budget: An Overview," in *Social Security and the Budget*, Henry J. Aaron, ed. Washington, DC: University Press of America, pp. 1-8.
- Boskin, Michael J. 1986. *Too Many Promises: The Uncertain Future of Social Security*. Homewood, IL: Dow Jones-Irwin.
- Chernick, Howard and Andrew Reschovsky. 1985. "The Taxation of Social Security," *National Tax Journal*, Vol. 38, No. 2, pp. 141-152.
- Czajka, John L.; Pat Doyle; Michael Walker; Richard Whitmore; and Constance Citro. 1982. "Benchmark Estimates for Transfer Income and Labor Force Statistics from the 1979 ISDP Research Panel: Final Report." Washington, DC: Mathematica Policy Research, Inc.
- Department of Labor. 1992 (February). *Employee Benefits for State and Local Governments, 1990*. Washington, DC: Department of Labor, Bureau of Labor Statistics.
- Department of Treasury. 1984 (November). *Tax Reform for Fairness, Simplicity, and Economic Growth*. Washington, D.C.
- \_\_\_\_\_. 1991 (March). *Report on the Taxation of Social Security and Railroad Retirement Benefits in Calendar Years 1987 and 1988*. Washington, DC: Department of Treasury, Office of Tax Analysis.
- \_\_\_\_\_. 1993 (January). *Report on the Taxation of Social Security and Railroad Retirement Benefits in Calendar Year 1990*. Washington, DC: Department of Treasury, Office of Tax Analysis.
- Dye, Richard F. 1985. "Influencing Retirement Behavior: Untangling the Effects of Income Taxation of Social Security Benefits," *Journal of Policy Analysis and Planning*, Vol. 5, No. 1 (Fall), pp. 150-154.
- Goss, Stephen C. 1989 (January 18). "Basis for taxation of 85 percent of OASDI benefits." Memorandum, Social Security Administration, Office of the Actuary.
- Lindeman, David. 1988. "An Analysis of Alternatives for Taxing Social Security as a Private Pension" (Staff Working Paper). Revised March. Washington, DC: Congressional Budget Office.
- Munnell, Alicia H. 1982. "Is it time to start taxing Social Security benefits?" *New England Economic Review*, May/June, pp. 18-27.
- Musgrave, Richard A. and Tun Thin. 1948. "Income Tax Progression," *Journal of Political Economy*, Vol. 56, December, pp. 498-514.
- Myers, Robert T. 1985. *Social Security*. Homewood, IL: Richard D. Irwin, Inc. (third edition).
- \_\_\_\_\_. 1989. "The 'proper' basis for taxing S.S. benefits," *The Actuary*, October, p. 8.
- \_\_\_\_\_. 1990. "Taxing Social Security benefits," *The Actuary*, March, p. 14.
- Pattison, David. Forthcoming. "Rationales for the taxation of Social Security benefits."
- Pattison, David and David E. Harrington. Forthcoming. *Policy Simulations of Proposals to Modify the Taxation of Social Security Benefits* (ORS Working Paper). Washington, DC: Social Security Administration, Office of Research and Statistics.
- Pellechio, Anthony J. and Gordon P. Goodfellow. 1983. "Individual Gains and Losses from Social Security Before and After the 1983 Amendments," *Cato Journal*, Vol. 3, No. 2 (Fall), pp. 417-442.
- Sammartino, Frank J. and Richard Kasten. 1983 (December). *The Distributional Consequences of Taxing Social Security Benefits: Current Law and Alternative Schemes* (Staff Working Paper). Washington, DC: Department of Health and Human Services, Office of Income Security Policy.

\_\_\_\_\_. 1985. "The Distributional Consequences of Taxing Social Security Benefits: Current Law and Alternative Schemes," *Journal of Post Keynesian Economics*, Vol. 8, No. 1 (Fall), pp. 28-46.

\_\_\_\_\_. 1988. "Distributional Analysis of Three Deficit Reduction Options Affecting Social Security Cash Benefits," in *The Distributional Impacts of Public Policies*, Sheldon H. Danziger and Kent E. Portney, eds. New York City: St. Martin's Press, pp. 116-148.

Wixon, Bernard; Benjamin Bridges, Jr.; and David Pattison. "Policy Analysis through Microsimulation: The STATS Model," *Social Security Bulletin*, Vol. 50, No. 12, pp. 4-12.

### ***Appendix: Adjustments to the CPS***

The following modifications are made to CPS data in the STATS policy simulations presented in this article:

**Top-coding.**—To protect confidentiality of the Census survey respondents, the incomes reported on the CPS had been capped at \$100,000 per person per type of income. These truncated amounts are adjusted in the STATS model by replacing top-coded amounts with higher amounts generated by a random draw from a Pareto distribution. The Pareto distribution parameter used for this random allocation of top-coded incomes is derived from Census information on the amount of income missing because of top-coding.

**Capital gains.**—Because the CPS does not ask about capital gains income, we used information from a sample of 1985 Federal tax returns, the Statistics of Income (SOI) public-use file, to impute capital gains to the tax-filing units on the CPS. The proportion of taxpayers in 1985 reporting capital gains or losses, and the amount of gains or losses, was obtained from the SOI data. These returns were unaffected by the large increase in the number of realizations made in 1986 in anticipation of higher capital gains taxes in 1987. The proportion of taxpayers reporting capital gains or losses, and the amount of gain or loss, was calculated for 53 different cells. These cells were defined by whether or not the taxpayer had income from wealth (interest, dividends, or rental income), whether or not the

taxpayer was aged 65 or older, whether or not the taxpayer was married and filing a joint return, and 12 income categories. Because the CPS and SOI do not provide identical information on the components of income, the income categories were determined using income components that were common to both the CPS and the SOI. For a given simulated CPS taxpayer, the probability of being imputed a capital gain or loss was set equal to the observed proportions of gains or losses in the corresponding cell of SOI observations. The amount of the imputed capital gain or loss was determined by a random selection from a cumulative distribution function estimated as a separate spline for each of the 53 cells. (Splines, rather than a simpler mean and variance parameterization, were used for the distribution of the gains and losses because preliminary tabulations showed that the distribution was far from normal.)

**Tax-free interest and pension income.**—The SOI file distinguishes between tax-free and taxable interest and pension income. The CPS does not. Tabulations from the 1987 SOI were used to determine the proportion of tax units, by income, with some tax-free interest or pension income and, for those units with such income, the proportion of the interest or pension income that was tax free. The parameters from these tabulations were then applied to STATS tax units on the CPS to randomly assign which units have tax-free interest or pensions and how much.

**Underreported income.**—The STATS model is based on CPS interview responses to survey questions about the preceding year's income for each person in the household. These responses are subject to systematic underreporting, particularly among types of income (such as interest and dividends) that are more important among older income recipients. (Some types of income, particularly business and rental income, are reported in higher amounts on the CPS than on income tax returns.) The mean income of the aged, as a result, tends to be underestimated in the CPS.

Because this study focuses on income taxation, the Internal Revenue Service's SOI data, based on tax returns,

were used to calibrate the STATS file. The adjustments were made on the basis of a comparison of the 1987 SOI file with the March 1988 CPS, which contains annual income information for 1987. The SOI data, however, cannot be considered representative of low-income tax units, because many low-income units, including many elderly units, do not need to file a return. The comparisons between the two files, therefore, were made only between taxable units: those units on the CPS file that, according to the STATS simulation, owed income taxes were compared with those units on the SOI file that owed income taxes. Because the calibrating adjustments to the CPS file changed the taxpaying status of some CPS units, the calibrating process was iterative.

Because of changes in the tax law, it is not possible after 1986 to accurately tabulate the tax filing characteristics of elderly tax units (units with one or more age exemptions) on the 1987 and later SOI. Earlier comparisons, however, have shown that the CPS has had fewer taxable elderly units than the SOI. A comparison, for example, of the unadjusted STATS simulation on the March 1987 CPS (simulating income year 1986) with the 1986 SOI showed the CPS to have 4.0 percent more taxable units than the 1986 SOI file but 15.3 percent fewer taxable elderly units than the SOI.

Part of the difference between the number of taxable SOI returns and the number of taxable STATS returns on the unadjusted STATS file is attributable to underreporting or overreporting of income on the CPS survey relative to that reported on tax returns. Overreporting on the CPS relative to the SOI seems to be present to a slight extent for wage income and to a large extent for self-employment and rental income. Underreporting on the CPS relative to the SOI is common with pension, interest, and dividend income. It is plausible that the excess of younger taxable STATS units and the shortage of older taxable STATS units is at least in part due to a tendency to find overreporting among the types of income prevalent in younger tax units and underreporting among the types of income prevalent in older tax units.

The calibrating adjustments described here seek to close the portion of the gap between SOI numbers of taxable returns and STATS taxable returns that is due to income-reporting differences. Two other causes for a reduced number of returns on the STATS model have nothing to do with income reporting and will not be affected by these adjustments: the CPS does not include institutionalized persons, like the residents of nursing homes, nor does it include persons who were alive at the beginning of the calendar year but who died before the time of the Census survey in the following March. Both these causes affect older units more than younger units; studies of the Social Security recipient population aged 65 or older have indicated that these factors might cause the survey population of aged beneficiaries to be 8 percent or more too low (Czajka et al., 1982, p. 42, in a study of a non-CPS Census file with similar coverage problems; the CPS file, however, should have a larger proportion of missing decedents than the file studied there).

Rather than try to match aggregate dollar amounts, which would require correcting for these coverage problems, the underreporting calibration sought to match average dollar amounts among taxable units. The calibration was done iteratively, comparing the average income among taxable units in the STATS model at each iteration with the corresponding income for taxable units on the SOI file, and adjusting the incomes on the next iteration of the STATS model accordingly. The initial run, for example, showed the average wage and salary amount among taxable units to be 3.5 percent lower on the SOI than in the CPS-reported incomes on the STATS model, so that on the next iteration wages and salaries were reduced by 3.5 percent. Similar comparisons were made for "business" income, defined on the CPS to include self-employment income, rent income, and other income; "funds" income (taxable interest, dividends, and trust income); taxable pension income (public and private combined), and tax-

able realized capital gains. Social Security income could not be compared, because tax filers are required to report Social Security income only if the Social Security income itself is taxable. The includable portion of Social Security benefits, however, can be compared, and the iterative factors derived from comparing taxable Social Security benefits were applied to all Social Security benefits at each iteration. Two other factors were calculated as part of the calibration process: a pair of factors used to adjust the percent of units who itemize deductions and the amount of itemized deductions among those who itemize (these itemizing factors are used to bring the simulation of itemized deductions, based on studies of older Internal Revenue Service data, into line with recent itemizing behavior).

The following factors were arrived at as a result of the calibration runs: all wages were multiplied by 0.9497. Funds incomes (interest, dividends, and trust) were multiplied by 1.3030. Business incomes were multiplied by 0.4502. Capital gains were factored up by 1.11946, pensions by 1.23621, and Social Security benefits by 1.1867.

These adjustments on the March 1988 CPS file have the effect of decreasing the number of taxable STATS units from 89.6 million to 87.9 million (compared with 89.0 million resident taxable returns on the 1987 SOI). The number of aged taxable units on the STATS model increased from 8.69 million to 8.73 million (no comparable number from the SOI). It is likely that there is still a shortfall attributable to the institutionalized and deceased population, although it is not known how much. When similar procedures were carried out for 1986 (using the March 1987 CPS file and the 1986 SOI file, a year in which the SOI contained sufficient information to accurately distinguish aged returns), the SOI had about 9 percent more aged returns than the adjusted STATS file.

The adjustments on the March 1988 CPS file raised average taxable income among the taxable aged units by 3.1 per-

cent. The average income tax increased by 3.5 percent. The amount of income tax attributable to benefit taxation went from \$2.67 billion to \$3.61 billion, somewhat higher than the Treasury estimate for 1987 benefit taxation revenues of \$3.15 billion (Treasury 1991). If a rough adjustment is made for the missing institutional and decedent population by increasing this amount by 9 percent, the resulting estimate would exceed the Treasury estimate by still more. (In contrast, the STATS estimate of revenues for current-law taxation of benefits in 1994, \$5.9 billion, falls short of Treasury's estimate for 1994 revenues, \$6.5 billion (Treasury 1993).

For CPS base files later than March 1988, the same adjustment factors developed in the calibration to the 1987 SOI file are applied. The adjustment factors for percent itemizing and amount of itemized deductions that were developed in that calibration are also applied to the STATS simulation of income taxes in later years.

**Projection to 1994.**—Between 1991, the year for which the CPS income questions were asked, and 1994, the year for which the policy changes were being simulated, there were changes in both the population composition and in average incomes. The population changes were incorporated in the simulation by changing the Census tabulation weights, using projections of population growth from the Social Security Administration. (The controls were for persons, by age and sex; a simultaneous-equations adjustment was used that operated on family weights while targeting numbers of persons.) Income changes were introduced by scaling each income response by an estimate of the change in per capita income by income type, using projections consistent with the Alternative II assumptions in the *1993 Trustees' Report of the Social Security Administration*. For the simulation of current-law taxation in the year 2000 discussed in footnote 23, a projection using the techniques described in this Appendix, but based on an earlier CPS file, was used.