Volume Title: Tax Policy and the Economy, Volume 1

Volume Author/Editor: Lawrence H. Summers, editor

Volume Publisher: MIT Press

Volume ISBN: 0-262-19263-2

Volume URL: http://www.nber.org/books/summ87-1

Publication Date: 1987

Chapter Title: Social Security and the American Family

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Chapter URL: http://www.nber.org/chapters/c10932

Chapter pages in book: (p. 139 - 159)

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Social Security and the American Family

Expected Social Security retirement benefits are the largest single "asset" available to most Americans. Social Security is also the source of the largest tax burden for a majority of American workers. Because the program is so large and complex, it is important to understand the investment deal it offers persons and families in different situations, as well as the aggregate financial and economic implications of the program and any change in it. Expected benefits depend on a variety of factors, such as one's marital status, age, sex, age-earnings profile, length of career, number of children, other income sources in retirement, and so on.

The purpose of this paper is to discuss a number of important issues associated with the "deal" and incentives projected to be offered by the current Social Security system, especially with respect to its treatment of the family. By treatment of the family, we mean the expected benefits, taxes, rates of return, and marginal benefits per incremental dollar of taxes paid for persons in different family situations: married versus single, number of earners in the family and the division of earnings between them, the special situation of widows and divorcees, and so on.

Although a number of authors have commented on various features of the Social Security system affecting people in these different situations,[1]

We wish to thank Larry Summers for useful suggestions and the Stanford University Center for Economic Policy Research and the NBER for support of this research. The research supported here is part of the NBER's Research Program in Taxation and Project in Government Budgets. Any opinions expressed are those of the authors and not those of the NBER. Some of the material in this paper elaborates work presented in M. Boskin, L. Kotlikoff, D. Puffert, and J. Shoven, Social Security: A financial appraisal across and within generations, NBER Working Paper no. 1891, April 1986.

1. See, for example, essays in Burkhauser and Holden (1982) and the discussion in Boskin et al. (1986).

we believe it is worthwhile to refocus attention on these specific issues in light of some important factors. Among these are the substantial changes introduced by the 1983 Social Security amendments, the changing actuarial projections used as the intermediate assumptions in the last few years, the dramatic changes in life expectancies, and the rapid change of the structure of American families toward more episodes of divorce, more single person households, and more common and lengthier widowhood than several decades ago, to name a few.

We begin by pointing out that Social Security offers very different ex ante "deals" and marginal returns for incremental taxes paid to persons of different income, family status, age, sex, and income. Although this may or may not be desirable, the extent of the differences is not widely appreciated. In particular, a substantial fraction of some subgroups in the population receive virtually nothing back for incremental taxes paid. Therefore, an important problem of Social Security is that it may rightly be perceived primarily as a tax and not as a savings scheme.

Among the features that treat persons of different family status differently in Social Security are the following:

1. The progressivity of the benefit formula
2. Survivors' benefits
3. Spousal benefits
4. Rules governing eligibility of divorced persons
5. The ceiling on Social Security taxable earnings
6. The taxation of one half of benefits over a certain income level for persons receiving benefits
7. Child survivors' benefits
8. The person's age cohort reflecting the maturity of the system and, therefore, their entire tax history.

Each of these factors interacts with the important non–Social Security features of differential life expectancies for different groups, most importantly for the issues discussed here, for maless and females, and the differential wage-level trajectories typical of males and females in the labor force.

There is a substantial variation in the typical Social Security benefits of female new beneficiaries, depending upon whether they receive the spouse benefit, their own worker benefit, or, in the case of widows, survivor benefits. Of new female beneficiaries in 1982, 64 percent were part of married couples, and 24 percent were widows. For the former, the most common benefit was the spouse benefit; for the latter, the survivor

benefit. Only about 30 percent of women who were ever married received benefits based on their own earnings history.[2]

As can be seen from this list of features of Social Security and other factors affecting the deal and the marginal linkages of benefits and taxes, the situation is rather complex. To clarify these issues, we organize the paper as follows. Section 1 presents a cursory literature review and a description of our data and methodology. Section 2 presents some comparisons among households with different earnings splits and different levels of earnings. We examine a single-earner couple and examples of two-earner couples where the earnings split is two thirds and one third between the husband and wife or fifty-fifty between the husband and wife. We present the expected present value of taxes paid, benefits received, and transfers, and, therefore, the expected internal rate of return on taxes paid for three total family earnings levels indexed to 1985: $10,000, $30,000, and $50,000. These projections are made for the cohort of persons born in 1945.[3] Our primary purpose here is not to discuss the intergenerational issues but rather the intragenerational issues of differential treatment of persons in different family status. The differences often amount to more than the value of a typical family house.

Also presented in section 2 is a discussion of the second-earners' range of zero-marginal return. The issue here is how much a wife must earn, for a given level of her husband's earnings, before she begins to receive any incremental return for the Social Security taxes she pays. We also discuss single males versus single females, and singles versus couples. The presence of spousal and survivors' benefits clearly changes the deal offered to couples versus singles.

Section 3 analyzes the marriage penalty or subsidy, that is, how a man and a woman fare under Social Security if they marry relative to how they fare if they stay single. The amounts involved are substantial, exceeding the more hotly debated marriage penalty in the personal income tax.

Section 4 discusses the situation for widows and divorcees. We present similar information on the present value of benefits, taxes, transfers, and rates of return, including those in which the widow worked or did not work prior to the assumed date of death of the husband. We also present the various situations defining the range of earnings widows would make without receiving any incremental Social Security benefits, or for nonworking wives, who start work at two thirds of their hus-

2. Social Security Administration (1985).
3. Boskin, et al. (1986) presents details for other cohorts.

bands' wage upon widowhood, the age after which they would receive no incremental Social Security benefits despite payment of substantial taxes. Analogous results are presented for divorcees. For the latter, a tremendous incentive exists to postpone divorce until after ten years of marriage. The financial stake can exceed $50,000.

Section 5 discusses the issue of the marginal linkage of benefits and taxes in more detail. The relation of the expected present value of benefits received for an incremental dollar of taxes paid varies substantially by family status and earnings level.

Section 6 discusses some parallel stories for the cohort born in 1975, given the actuarial projections of the Social Security Administration, ignoring any potential long-term financial solvency problems of the system, and accounting for several changes relative to the 1945 cohort.

Section 7 offers a brief conclusion and summary of the results.

1. *The Present Study in Perspective*

Several studies have attempted to estimate the "deal" different households receive or can expect to receive in the future from the Social Security retirement program. It is well known that the early cohorts of retirees had very large rates of return on their taxes and that future retirees, especially wealthy ones, will not fare well relative to rates of return available on private assets.[4]

The primary contribution of this study is to update the results to the post-1983 amendments situation (of the studies cited, only Pellechio and Goodfellow (1983), Boskin (1986), and Boskin et al. (1986) do so), allow for recent changes in the Social Security Administration's actuarial assumptions about future economic and demographic factors, present a wider range of cases, examine the marginal linkage between taxes paid and benefits received, and focus in particular on the situation of women in these updated cases (supplementing the important work in the Burkhauser and Holden volume).

We use a computer simulation to convert assumptions about households' wages, expected mortality, and economywide growth in real wages into expected present values of Social Security taxes, benefits, net transfers, and internal rates of return. We also thus derive the mar-

4. A sample of such studies includes Boskin, Avrin, and Cone (1983), Hurd and Shoven (1985), Boskin (1986), Pellechio and Goodfellow (1983), Flowers (1977), Ricardo-Campbell (1977), and several studies in the book by Burkhauser and Holden (1982), of particular importance because it focuses on the role of women in the Social Security system as it existed at the time the essays were written and under various alternatives. See also Boskin et al. (1986) and the survey by Thompson (1983).

ginal linkage between incremental taxes paid and incremental benefits received.[5]

2. *Comparisons Among Households (1945 Cohort)*

Social Security—both when it was introduced and every time it was expanded—has been a major vehicle for transferring resources from the younger, richer, working generation to the older, poorer, retired generation. But these transfers do not occur uniformly across different types of families. Tables 1 and 3 show how the expected present value of benefits, taxes, and transfers for single men and women of different income levels and for married couples vary with different levels and composition of income. In Table 1, we note that moving from single-earner households to an identical earnings stream split between the couple reduces the expected present value of benefits and the expected present value of transfers substantially for all three earnings levels considered. The "deal" as measured by the internal rate of return on expected taxes paid worsens as we move toward a more equal division of the earnings and, obviously, as we move for any type of household to higher earnings levels. For example, a couple with $30,000 (at the 1985 wage index) in which the husband was the sole earner would receive a 2.3 percent internal rate of return on $136,498 taxes paid and therefore suffer a $27,370 loss, discounting benefits and taxes at a 3 percent real rate of return. The corresponding numbers for a two third–one third and one half–one half split

5. Obviously, to conduct these analyses, one must make various assumptions. We consider households that vary in several attributes: marital status, year of birth, the amount of total earnings and its division between wife and husband. We calculate expected taxes and benefits using mortality probabilities computed separately for males and females, and separate mortality tables are used for different cohorts. The tables used are those prepared for the intermediate assumptions in the 1983 *Report of the Trustees of the Old Age and Survivors and Disability Insurance Trust Funds.*

All earnings levels reported in tables below correspond directly to twenty-five-year olds in 1985. We assume that wages for males increase 1 percent per year of age, and for females 0.5 percent per year of age, until age fifty. Thus, for the 1945 cohort, male wages in 1985 will be about 16 percent higher than earnings levels listed, since the males will be forty rather than twenty-five, and female wages will be nearly 8 percent higher for the same reason. Earnings levels also vary annually with economywide wage growth. We use the Social Security Administration's intermediate wage growth assumption (roughly 1.5 percent per year beyond inflation) from the 1985 *Report of the Trustees of the Old Age and Survivors and Disability Insurance Trust Funds.*

We estimate the expected taxation of one half of future benefits to the extent that that portion of one's benefits plus other adjusted gross income exceeds the nonindexed threshold levels of $25,000 for singles and $32,000 for couples. We use the tax law in existence when this paper was written. The results would vary somewhat given the reduction in marginal tax rates in the tax law about to be phased in.

For further details, see Boskin et al. (1986).

of income, adding to $30,000, are 1.75 percent and 1.45 percent for the rate of return and transfers of −$48,715 and −$54,199. Thus, for the same earnings levels, we see the pattern repeated. Not only does the rate of return vary by family type and earnings level, but there is a substantial interaction between the two. For example, for single-earner households, the rate of return received by a $50,000 earning household is about one half that for the $10,000 household (1.95 percent versus 3.74 percent), whereas for the households with the equal division of earnings the comparable numbers are 0.61 percent versus 3.81 percent, a fivefold rather than a twofold ratio. Clearly, the interaction of the spouse benefit and the incremental taxes paid as the spouse earns a greater amount of taxable income worsens the deal substantially.

Table 2 reports the range of zero-incremental returns for the 1945 cohort for the second earner. For the same three earnings levels for the primary earner, we derive the mininum earnings level per year to receive any incremental return from Social Security taxes paid by the second earner (rather than just collecting the spouse's benefits and "losing" all Social Security taxes paid). Note that this calculation understates the minimum earnings level necessary for second earners with intermittent

Table 1 COMPARISON ACROSS DIVISIONS OF HOUSEHOLD EARNINGS FOR 1945 COHORT, VARIOUS EARNINGS LEVELS (1985 DOLLARS DISCOUNTED AT RATE 3 PERCENT TO 1985)

Division of earnings (Husband-wife)	*Total family earnings level (At 1985 wage index)*		
	10,000	30,000	50,000
1–0 (single earner)			
P.V. benefits	62,679	109,128	100,503
P.V. taxes	48,951	136,498	140,253
P.V. transfer	13,727	−27,370	−39,750
Rate of return	3.74%	2.30%	1.95%
⅔–⅓			
P.V. benefits	53,293	96,044	108,428
P.V. taxes	48,264	144,760	218,119
P.V. transfer	5,029	−48,715	−109,689
Rate of return	3.30%	1.75%	0.80%
½–½			
P.V. benefits	50,936	89,578	109,457
P.V. taxes	47,926	143,777	233,433
P.V. transfer	3,010	−54,199	−123,975
Rate of return	3.18%	1.54%	0.61%

work histories because it is assumed that this 1985 earnings level will continue each year until retirement.[6] For those who step out of the work force for a long time, the numbers would be much larger. As an example, consider the primary earner who is earning $30,000 per year. If the spouse goes to work, he or she would have to earn almost $10,000 per year before receiving *any* incremental return. In short, the first $9,600 per year of earnings upon which over $1,000 of taxes would be paid (by the employee and employer) would result in no incremental return to the Social Security benefits for the couple. This is another way to view the differences between the different earnings splits of families.

In short, there is a substantial tax on married women's labor force participation through the spouse's benefit. Until the married woman's own earnings history (if any) is sufficient to produce benefits beyond the spouse's benefit, the entire Social Security payroll tax is a pure tax, with no corresponding presumption of future incremental Social Security benefits. Since the Social Security payroll tax for Old Age and Survivors Insurance exceeds 10 percent and is expected to rise, this is a substantial extra tax bite at the margin (we make the usual presumption that the employee bears both the employer and the employee component of the tax to be a reasonable first approximation). Under the new income tax reforms, this raises marginal tax rates about 70 percent and 35 percent for those in the 15 percent and 28 percent brackets, respectively.

Table 3 presents a comparison among single-earner couples, single males, and single females at various earnings levels. The story is much the same as that reported above for single-earner versus two-earner couples, although singles, especially single males, fare especially poorly. The reason why single-earner couples do so well reflects the extra benefits due to the joint survivor nature of Social Security benefits for the same taxes paid. Different life expectancies are responsible for the male and female differences among singles. The single-earner couple collects the spouse

6. The retirement benefit of the spouse is based on an average indexed monthly earning that would include a substantial number of years of coverage.

Table 2 SECOND EARNER'S RANGE OF ZERO INCREMENTAL RETURN (1945 COHORT)

First earner's earning level	*10,000*	*30,000*	*50,000*
Second earner's minimum earnings level to receive an incremental return[a]	2,900	9,600	10,000

[a]In this simulation, both earners' wages increase at the male age profile of wages.

benefit while both are alive, and survivor benefits are received by a surviving spouse if the single earner has died first. Clearly, in the case of singles, there are by definition no survivors to receive such benefits. Hence, the expected present value of taxes paid is quite similar at each earnings level for each of the three types of households, but the expected present value of benefits differs enormously.

For example, at the $30,000 level the expected present value of taxes is about $136,000 for single males and single-earner couples, and only a few thousand dollars less for single females.[7] However, the expected present value of benefits ranges from $52,000 for single males to $109,000 for the single-earner couple.

In brief summary, these tables reveal enormous differences in the expected present value of benefits and rates of return on taxes paid to different family types at each earnings level and the important interaction of family type and earnings level in determining the "deal" various families get from Social Security. Although these data are interesting and instructive, we need to probe more deeply into the situation facing wid-

7. The difference is due to assumptions concerning mortality probabilities and how earnings rise with age.

Table 3 COMPARISON AMONG SINGLE-EARNER COUPLES, SINGLE MALES, AND SINGLE FEMALES OF 1945 COHORT, VARIOUS EARNINGS LEVELS (1985 DOLLARS DISCOUNTED AT RATE 3 PERCENT TO 1985)

	Earnings level (At 1985 wage index)		
Family type	10,000	30,000	50,000
Single-Earner Couple			
P.V. benefits	62,679	109,128	100,503
P.V. taxes	48,951	136,498	140,253
P.V. transfer	13,727	−27,370	−39,750
Rate of return	3.74%	2.30%	1.95%
Single Male			
P.V. benefits	29,913	52,282	48,532
P.V. taxes	48,951	136,498	140,253
P.V. transfer	−19,038	−84,216	−91,721
Rate of return	1.42%	−0.25%	−0.60%
Single Family			
P.V. benefits	40,306	71,715	69,590
P.V. taxes	46,901	130,802	144,723
P.V. transfer	−6,595	−59,087	−75,133
Rate of return	2.55%	1.13%	0.68%

owed and divorced persons. This is especially true because of the likelihood that they will be receiving benefits that are quite low, that they may well be the group in the population most likely to be poor in old age,[8] and because changing family conditions and life expectancies in the United States render the treatment of widows and divorced persons increasingly important in the evaluation of the adequacy and cost effectiveness of Social Security benefits.

3. *Marriage and Children*

Social Security creates important incentives and provides various subsidies or penalties to family creation and dissolution. For example, there is a huge financial stake in staying married for ten years for those contemplating divorce after a few years of marriage (detailed more fully in section 4). Likewise, Social Security provides some auxiliary benefits for children, especially child survivor benefits. But because of the evolution of the system, these same children will in the future likely pay much more in taxes than they will receive in benefits. Finally, because Social Security provides both spouse benefits and spousal survivor benefits, and also because marriage may raise the marginal income tax rate that is applied to one's benefits, a single male and a single female contemplating marriage may face a marriage penalty or subsidy.

Table 4 presents calculations of this marriage subsidy or penalty for various combinations of the (newly married) husband's and wife's earnings levels, assuming that both spouses continue working on the same earnings path. One very important Social Security subsidy is demonstrated in the entries in the table with zero for "wife's earnings" and in the columns for "wife stops working." In each of these situations, the couple gets a subsidy given by the spouse's benefit. The subsidy exceeds $50,000 in virtually every case. Thus, these couples do much better under Social Security married than as singles. Although the wife leaving her job upon marriage is an extreme case, we present these numbers to indicate the value of that "option" to the married couple over its lifetime. For those couples where both spouses continue to work *and* the wife's earnings are sufficient to generate her own worker's benefits, the table also demonstrates that higher income taxes paid on a portion of Social Security benefits more than offsets the extra value of the survivor's benefit based on the husband's (possibly high) earnings. This penalty can amount to $9,000 or $10,000 when discounted at 3 percent, considerably more

8. See Boskin and Shoven (1986).

when discounted at lower rates. This sum is modest relative to the subsidies to the nonworking spouses.

That is not the end of the story, however. Most of those singles who marry will have children, and they in turn will probably pay considerably more in taxes than they receive back in benefits. Although this is unlikely to be of major concern in marriage or fertility decisions, it is interesting to note the expected change in family finances, including the impact from the children's taxes and benefits. Such hypothetical scenarios are presented in Table 5. For several combinations of parents' earnings and children's expected earnings, we see that the "bad deal" the children get offsets the subsidy to nonworking spouses and substantially increases the marriage penalty for working spouses. The table considers hypothetical singles from the 1945 cohort who marry and (for simplicity) have two children (one male, one female) in 1975. We assume that the

Table 4 MARRIAGE SUBSIDY OR PENALTY (1945 COHORT; 1985 DOLLARS DISCOUNTED AT 3 PERCENT TO 1985)

Husband's earnings level	*Wife's earnings level*	*Wife keeps working (Change in benefits = change in net transfer)*	*Wife stops working*		
			Change in benefits	Change in taxes	Change in transfer
$40,000	$40,000	−8,749	−25,814	−117,089	91,275
	20,000	−4,471	−14,568	−69,496	54,928
	0	54,388	—	—	—
$30,000	$30,000	−9,551	−25,305	−103,170	77,865
	15,000	3,214	−2,051	−52,122	50,071
	0	56,846	—	—	—
$20,000	$20,000	−4,656	−18,672	−69,514	50,842
	10,000	9,422	6,584	−34,748	41,332
	0	47,050	—	—	—

Table 5 "DEAL" FOR FAMILY (INCLUDING ESTIMATED TREATMENT OF CHILDREN) FROM MARRIAGE AND CHILDREN[a] (1945 AND 1975 COHORTS; 1985 DOLLARS, DISCOUNTED AT 3 PERCENT TO 1985)

Husband's earnings level	*Wife's earnings level*	*Wife works*	*Wife stops working*
$30,000	$30,000	−41,907	45,509
	15,000	−29,142	17,715
	0	24,490	—

[a]Ignores value of child survivor benefits.

children have one earner with the same relative earnings as their father.[9] Since each future couple has two sets of parents, we attribute one half of the deal to each child in this couple.

Social Security provides various incentives and redistributions because of its many rules and features, such as the spouse benefit, the survivor benefit, and taxation of earnings of individuals (as opposed to families). In some cases, as documented above, the redistribution is large relative to the disputes over features of the personal income tax. Some of the marriage subsidies are much larger than the annual small marriage penalty in the income tax. The marriage penalties, combined with the poor deal for children can be many times the marriage penalty in the income tax. Whether the marginal incentives are sufficient to change behavior in labor force participation and family formation and dissolution is less obvious. Clearly, some of the incentives, such as staying married a tenth year if contemplating divorce after nine years of marriage, are likely to be so strong as to affect behavior noticeably. That the spouse benefit renders the payroll tax a pure tax with no incremental return undoubtedly reduces the labor supply of married women. Other incentives exist, but they may only affect behavior slightly, if at all.

4. *Widowhood and Divorce*

Tables 6 and 7 present comparable information to that presented above for archetypical situations for widowed and divorced women. Comparable information could be generated for widowers and divorced men, but they are, at least historically, of somewhat less interest given the much higher male labor force participation rates than those for females. The projected treatment of widows born in 1945 at various earnings levels and discounted to constant 1985 dollars reveals some interesting facts. Our archetypical situation contemplates a widow who loses her husband when they are both age fifty. The expected present value of benefits includes, where applicable, survivor benefits and retired worker benefits. The present value of taxes includes taxes paid by the husband before his death. As we can see by comparing Tables 6 and 1, widows who lose their husbands at relatively early ages get a much poorer internal rate of return than surviving couples of comparable earnings levels.

The rates of return for widows in the middle and upper earnings range are quite low, even negative for those who were working and will continue to work after their husbands' death. Take the example of the one half–one half earnings split: the widow who is from a couple where each

9. Note that this means the negative transfers are the smallest for any of the family patterns.

Table 6 TREATMENT OF WIDOWS[a] OF 1945 COHORT, VARIOUS EARNINGS LEVELS (1985 DOLLARS DISCOUNTED AT RATE 3 PERCENT TO 1985)

Division of earnings (Husband-wife)	*Total family earnings level (At 1985 wage index)* 10,000	30,000	50,000
1–0 (single earner)			
P.V. benefits	41,025	74,012	69,201
P.V. taxes[b]	36,056	97,771	101,570
P.V. transfer	4,969	−23,759	−32,369
Rate of return	3.33%	2.28%	2.00%
⅔–⅓			
P.V. benefits	33,704	57,930	69,115
P.V. taxes[b]	40,141	120,390	181,795
P.V. transfer	−6,437	−62,460	−112,680
Rate of return	2.53%	1.01%	0.30%
½–½			
P.V. benefits	34,068	58,954	73,405
P.V. taxes[b]	42,189	126,566	204,742
P.V. transfer	−8,121	−67,612	−131,337
Rate of return	2.40%	0.85%	0.07%

[a]That is, widows who lose their husbands at age fifty.

[b]Includes taxes paid by husband before his death.

Table 7 WIDOWS' AND DIVORCED WOMEN'S RANGE OF ZERO INCREMENTAL BENEFITS (1945 COHORT)

Husband's Earnings Level	*10,000*	*30,000*	*50,000*
Widow's minimum earnings level to receive an incremental return[a]	7,500	21,000	22,000
Latest age at which widowhood occurs, and widow first begins work at ⅔ of husband's wage, to receive an incremental return[a]	39	41	45
Divorced woman's minimum earnings level to receive an incremental return[a]	2,900	9,600	10,000
Latest age at which divorce occurs, and divorced woman first begins work at ⅔ of husband's wage, to receive an incremental return[a]	51	49	54

[a]In this simulation, both earners' wages increase at the male age profile of wages.

earner earned $25,000 (adjusted to the 1985 wage level) would lose $131,000 because she and her deceased husband paid in taxes of $204,000 and received back $73,000 in expected present value of benefits. The internal rate of return is barely over zero percent. Only for single-earner, low-income households do widows receive a rate of return comparable to our assumed 3 percent discount rate.

In comparing similar columns and rows from Table 6 with those in Table 1, note several important facts. First, Table 1 is completely ex ante; that is, everything is in expected value terms.[10] Table 6 is somewhat ex post: we have presumed that the husband survived to age fifty and the widow to retirement age, and we use mortality probabilities of 1 at age fifty for the husband and the life table mortality probabilities beyond age sixty-six for the surviving wife. Second, we assume that widows of single-earner households do not go back to work. Such a widow may in fact begin work but will not be able to work enough to increase her benefits beyond the spousal survivor benefit. Because she will pay substantial taxes with no return in benefit, she will be worse off than the table actually suggests. The same is true for the two thirds–one third earnings split; continuing to work at the same earnings level, the widow will get more as a survivor than as a retired worker, and hence get nothing for incremental taxes paid for the remainder of her work life. However, when each spouse earns half the income, the widow will get more as a retired worker than as a survivor if she continues to work at the same earnings level. Third, we ignore the possibility of remarriage for the purpose of this calculation.

Again, as for married women, we present the range of conditions generating zero incremental benefits for widows and divorced women. These conditions are presented for three presumed (1985 indexed) husbands' earnings levels: $10,000, $30,000, and $50,000. The data are presented in two ways. First, we consider the minimum earnings level necessary for a woman to receive an incremental return. Second, we consider the latest age at which widowhood or divorce could occur in order for a woman to receive an incremental benefit if the woman only then first begins work at two thirds of the husband's wage rate (slightly higher than the average ratio of female to male wages). Thus, in the first panel we note that for a husband's earning level of $10,000, a woman who is widowed at age fifty would need to earn $7,500 (indexed) per year for the remainder of her work life to receive any incremental return whatsoever. All taxes paid under $7,500 (indexed) would result in zero incremental return. The analogous numbers for widows of husbands earning $30,000 a year and

10. Thus Table 1 includes the case of early widowhood weighted by its probability.

$50,000 a year are indeed large: $21,000 and $22,000, respectively. Thus, a widow who returns to work full time for the remainder of her work life, earns up to $20,000, and is responsible for joint employee and employer payroll taxes for retirement of well over $2,000 a year would be receiving no incremental return.

In the second panel, we present the latest age at which widowhood could occur, and the widow begin work, for the widow to receive an incremental return. For the three earnings levels, these ages are 39, 41, and 45. Thus, only a woman widowed quite young who goes back to work earning two thirds of her husband's wages over her remaining work life will receive any incremental return. The rate of return will still be quite modest, because the contributions by and on behalf of her husband will generate no return for she will switch from survivor benefits to retired worker benefits.

The table also presents analogous information for divorced women. Recall that women who are married for less than ten years do not "vest" in the husband's earnings records. Conversely, any given earnings history may generate more than one divorced person's benefit if there were two or more marriages that lasted ten years or more, apparently a growing phenomenon in the United States. Women do not lose from remarriage because they can get benefits based on a former spouse's earnings history. The corresponding earnings levels for women married for more than ten years, and hence entitled to the spouse benefit based on their ex-husband's entire earnings history, to receive any incremental benefits at all are $2,900, $9,600, and $10,000, considerably less than for widows.[11]

Correspondingly, the latest age at which divorce could occur (assuming on remarriage) and the divorced worker go to work at two thirds of the husband's earnings rate and receive *any* incremental benefits are 51, 49, and 54, respectively. If the woman's earnings record is considerably smaller than two thirds of the projected earnings of the divorced husband, these ages would be considerably younger. Of course, a divorced person who is not vested in her spouse's earnings history receives incremental benefits as soon as she goes to work.

These data reveal several interesting facts. First, there is an enormous incentive to postpone divorce until the ten-year "vesting" period is completed. For example, in a one-earner couple with the husband earning $30,000 indexed to 1985, a divorce after nine years of marriage would cost the divorcee about $35,000–$40,000 discounted to 1985! This is more than the median net financial assets of U.S. households.

11. They need only achieve a retired worker benefit equal to one half that of their husbands to switch from a spouse benefit to their own retirement benefit.

In an era when life expectancies are growing (especially for women who have already reached traditional retirement ages) and when divorce and remarriage have become much more prevalent, these enormous variations in the treatment of different individuals, some of whom may differ little in when their widowhood or divorce occurred, suggest that continued pressure will be placed upon Social Security to reform the nature of its taxation and benefit payments to families and individuals.

5. *The Marginal Linkage Between Benefits and Taxes*

We have presented several types of information for various types of households, including widows and divorcees, traditional one-earner and two-earner couples, single males, and single females. Most of the information concerns the expected present value of total taxes paid, expected present value of total benefits received, and, therefore, the lifetime transfer, as well as the internal rate of return, on expected taxes paid. We have discussed some issues of incremental linkage, such as the age or the earnings at which a person would start to earn their retired worker benefits and begin to receive an incremental return on their taxes, switching over from spousal, survivor, or divorced person's retirement benefit.

It is instructive to note the discounted expected *marginal* benefit for marginal taxes paid (we assume the extra taxes are spread over the lifetime in proportion to earnings). We present this information in Table 8 to give some idea of the marginal linkage for archetypical couples and singles. For each of our archetypical earnings levels, the table considers for male or female the discounted expected extra benefits paid for a dollar of extra taxes spread over the lifetime. These data are for the cohort born in 1960, who have recently entered the labor force, and are discounted to 1985 with a 3 percent real discount rate. Four cases of family status are presented: one-earner couple, two-earner couple where each is presumed to earn one half of the earnings, single males, and single females. Some remarkable facts emerge.

In *no* case is the marginal linkage as high as one hundred percent. Nobody gets back an incremental dollar for an incremental dollar of tax paid. The figures presented in Table 8 range from a marginal linkage as low as $0.12 on the dollar for a female in a high-wage, two-earner couple and $0.15 on the dollar for a single male of middle income to $0.73 on the dollar for a low-income male in a one-earner couple. Note that for some of the entries in the table the particular case involved is at the maximum tax; hence, there can be no additional taxes considered as part of this experiment. Note also that in a one-earner couple, the female receives

nothing for an incremental dollar of taxes paid. The female would have to earn a substantial amount of earnings to generate expected Social Security benefits in excess of the spouse's benefit received by the couple independent of any earnings she may produce.

For two-earner couples, the discounted expected incremental benefit per incremental tax paid differs for males and females. The extra linkage to male taxes for a couple involves the joint survivor annuity nature of Social Security benefits in the single-earner case and the survivor benefits for the wife in the two-earner case. The reduced linkage for two-earner wives occurs because she collects survivor benefits rather than retired worker benefits after her husband dies.

There are many reasons why we might be interested in marginal linkage in addition to or instead of total returns. First, to the extent that the complicated system eventually becomes understood,[12] it is the marginal linkage that determines the extent to which Social Security's payroll tax will be thought of as a tax rather than as forced saving. To the extent that it is thought of as a tax, it will substantially increase the effective marginal tax rate on labor earnings, worsening the labor market distortion caused by higher marginal tax rates. Finally, equity may be thought of as equal treatment of people at the margin as well as on average. We make no claim for this, but identical treatment of people at the margin can lead to vastly different treatment of people on average, and vice versa. We merely present the numbers for additional information.

12. This may be more reflective of a person getting close to retirement, attempting to gather information and to calculate what their benefits will be under different stages of retirement and continued earnings levels than for the general population.

Table 8 DISCOUNTED EXPECTED MARGINAL BENEFIT PER MARGINAL TAXES PAID, WITH EXTRA TAXES SPREAD OVER LIFETIME (FOR 1960 COHORT AT 3 PERCENT REAL DISCOUNT RATE)

Earnings level	*Contributor*	*1-Earner couple*	*2-Earner couple*	*Single male*	*Single female*
$10,000	Male	.730	.546	.348	—
	Female	0	.301	—	.474
$30,000	Male	.338	.517	.150	—
	Female	0	.286	—	.205
$50,000	Male	*	.216	*	—
	Female	0	.119	—	*

*At maximum tax.

6. *Evolution of the System*

Tables 9, 10, and 11 present some information, comparable to that presented earlier, for a later cohort, that born in 1975. Obviously, projecting the future over the lifetimes of these individuals and families is subject to a greater range of error than for the younger cohorts. Among the reasons are the potential financial solvency problems that Social Security may face in the future, which include the expected long-term actuarial deficit in Old Age, Survivors, and Disability Insurance (OASDI), which may become larger due to the reduced reflow of income credited to Social Security when the new tax bill passes (which will lower marginal tax rates and hence the tax rate applicable to one half of Social Security benefits received by well-off retirees); and, indeed, Social Security's retirement and disability funds are scheduled to accrue immense surpluses from around 1990 to 2020, which are needed if we are to avoid drastic tax increases when the baby-boom generation retires. Of course, we have no guarantee that we will be able to accrue such massive surpluses. (Boskin (1986) estimates that they will accumulate to a size approximately that of the entire present national debt.) There may be political pressure to use

Table 9 COMPARISON ACROSS DIVISIONS OF HOUSEHOLD EARNINGS FOR 1975 COHORT, VARIOUS EARNINGS LEVELS (1985 DOLLARS DISCOUNTED AT RATE 3 PERCENT TO 1985)

Division of earnings (Husband-wife)	*Total family earnings level (At 1985 wage index)*		
	10,000	30,000	50,000
1–0 (single earner)			
P.V. benefits	37,775	67,464	63,052
P.V. taxes	33,273	99,820	112,081
P.V. transfer	4,502	−32,356	−49,029
Rate of return	3.37%	1.85%	1.36%
⅔–⅓			
P.V. benefits	32,052	58,835	67,321
P.V. taxes	32,796	98,387	159,560
P.V. transfer	−744	−39,552	−92,239
Rate of return	2.93%	1.49%	0.45%
½–½			
P.V. benefits	30,587	54,874	67,152
P.V. taxes	32,560	97,680	162,800
P.V. transfer	−1,973	−42,806	−95,648
Rate of return	2.82%	1.29%	0.34%

Table 10 TREATMENT OF WIDOWS[a] OF 1975 COHORT, VARIOUS EARNINGS LEVELS (1985 DOLLARS DISCOUNTED AT RATE 3 PERCENT TO 1985)

Division of earnings (Husband-wife)	*Total family earnings level (At 1985 wage index)*		
	10,000	30,000	50,000
1–0 (single earner)			
P.V. benefits	24,400	46,621	44,594
P.V. taxes[b]	24,503	73,509	85,835
P.V. transfer	−103	−26,888	−41,241
Rate of return	2.99%	1.89%	1.43%
⅔–⅓			
P.V. benefits	20,046	35,117	43,813
P.V. taxes[b]	27,220	81,658	134,642
P.V. transfer	−7,174	−46,541	−90,828
Rate of return	2.20%	0.79%	0.06%
½–½			
P.V. benefits	20,286	35,792	44,652
P.V. taxes[b]	28,581	85,743	142,905
P.V. transfer	−8,295	−49,951	−98,253
Rate of return	2.08%	0.63%	−0.17%

[a]That is, widows who lose their husbands at age fifty.

[b]Includes taxes paid by husband before his death.

Table 11 RANGE OF ZERO INCREMENTAL RETURN FOR SECOND EARNERS, WIDOWS, AND DIVORCED WOMEN (1975 COHORT)

First earner's or husband's earnings level	*10,000*	*30,000*	*50,000*
Second earner's or divorced woman's minimum earnings level to receive an incremental return[a]	2,900	9,600	10,000
Widow's minimum earnings level to receive an incremental return[a]	7,600	22,800	26,500
Latest age at which widowhood occurs, and widow first begins work at ⅔ of husband's wage, to receive an incremental return[a]	40	40	42
Latest age at which divorce occurs, and divorced woman first begins work at ⅔ of husband's wage, to receive an incremental return[a]	52	50	55

[a]In this simulation, both earners' wages increase at the male age profile of wages.

the surplus to bail out Medicare, to raise benefits, or to lower taxes. Still, we present these data as if the Social Security Administration's economic and demographic intermediate projections will hold, and the system will have sufficient funds so that tax rates and benefit formulae remain as now scheduled. We also use the current tax law rather than the one about to be phased in.

In Table 9, we first note that the lower dollar figures reflect primarily thirty years of additional discounting. The absolute scale of the system expands, in fact, with increases in average wages. The earnings levels presented have increased with real wages as well, so that a person in this cohort at age forty-five in 2020 will be receiving much higher wages than the 1985 wage index presented here; for example, $30,000 indexed to 1985 would correspond to over $50,000 by 2020. These are still constant 1985 dollars; we choose this way of presenting the data to compare persons of approximately the same position in the income distribution. Note also that the retirement age under current law will have risen from sixty-six to sixty-seven for this cohort relative to the 1945 cohort, that life expectancy has increased substantially, real wages have increased, OASI tax rates are somewhat higher, and the benefits would be taxed at higher tax brackets under the existing income tax (but not under the tax reform about to be passed—whether that will be the tax law in effect when these persons retire is highly unlikely). The pattern of rates of return is quite similar for the different types of families and the different earnings levels. Tables 9 and 10 reflect a similar qualitative pattern, despite the three years of additional discounting making the numbers smaller, to the corresponding Tables 1 and 6. As earnings levels increase, rates of return decrease and lifetime transfers become large negative amounts. As we move from single-earner to two-earner couples, rates of return decline substantially. Comparing Tables 9 and 10, with the same caveats we used when comparing Tables 1 and 6 (the partial ex post nature of treatment of widows who are presumed to survive to age fifty with their husbands), suggests that the rates of return for widows are much lower and the transfers somewhat smaller (including larger negative transfers) than those for the couples in Table 9. The striking feature is that women widowed in middle age are projected to do very poorly under Social Security into the indefinite future under current law.

Table 11, similar to Table 7, but in this case for the 1975 cohort, presents comparable information about the second-earner or divorcee's minimum earnings level to receive incremental returns, the same information for widows, and the latest age at which widowhood or divorce could occur, subject to our assumptions, and any incremental returns to be received on the taxes paid by working widows or divorced women. The pattern is

quite similar to that reported in Table 7. Widows need substantial earnings levels to receive any incremental return—that is, to switch from the survivors benefit to their own retired worker benefit. A widow whose husband has received (in 1985 adjusted and indexed dollars) $30,000 per year would have to go back to work at age fifty for the remainder of her work life (assumed to be until age sixty-seven) and earn $22,800 a year in order to receive any incremental return. Similarly, the same woman would have to be widowed no later than age forty if she went back to work at two thirds of her husband's earnings level before she received any incremental return. Analogous data are presented for divorcees and for those with husbands with different earnings levels.

Again, these data reveal the substantial variation in the treatment of divorced and widowed women, depending upon such things as the age at which these events occur, as well as their husbands' or ex-husbands' earnings, and highlight one of the major issues involved in debates over earnings sharing as a possible Social Security reform.

7. *Conclusion*

We have presented the results of a computer simulation of the expected present value of benefits, taxes, and transfers, and rates of return, and marginal linkage of benefits and taxes for persons in various income levels and family status. The most striking feature is the enormous variation in the treatment, both in total and at the margin, Social Security offers each of these archetypical family types. Perhaps this variation is desirable and warranted; still, it has not been systematically presented as an optimal design for the system, given the magnitude of variation that we have derived.

These results do point out the tremendous amounts at stake for various family types in the Social Security system and any potential reforms in it. Often these amounts dwarf any conceivable changes in tax burdens under the individual income tax. For many groups in the population, the amount of the expected value of the transfers involved exceeds the median value of a home.

Because Social Security is so important, large, and complex, information such as this, despite a history of related studies under earlier actuarial assumptions and law, seems not to have worked its way to the general public discourse concerning the efficiency and equity of the design of the Social Security system. We hope these results will contribute to a better understanding of how the current Social Security retirement system, as it is projected into the future, is likely to affect families of different types and circumstances.

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