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SIMULATING AGGREGATE AND DISTRIBUTIONAL EFFECTS OF VARIOUS PLANS FOR MODIFYING THE RETIREMENT EARNINGS TEST

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PREFACE

Social Security's retirement test continues to receive considerable attention among policymakers. During the past several years a variety of proposals have been advanced that would modify or eliminate the test for persons aged 65-69. In January, 1989 we completed a study report, prepared for SSA internal use, that examined several of these proposals, analyzing their effect on earnings, taxes, and benefits in the first year of implementation, assumed to be 1990. The analysis included both aggregate estimates and estimates for selected population subgroups.

Although the specific proposals for modifying the retirement test have changed somewhat during the past two years, continued congressional interest has prompted the release of this initial version of our research for public discussion. Because we are in the process of revising the report for final publication, readers are cautioned that numbers and interpretations contained in this paper are subject to change.

The skillful research assistance of Delores Johnson and Thomas Solomon is gratefully acknowledged, as well as the helpful comments of John Hambor, Selig Lesnoy and Michael Packard on earlier drafts.

Executive Summary

This analysis considers the first-year (1990) effects of eliminating or modifying the Social Security retirement earnings test (RET) for those between the ages of 65 and 69. Most of the estimates presented assume that some of those affected by the RET will adjust their work effort if the test is changed; a range of adjustments is assumed. Estimates are also presented of the changes in income tax liability and payroll tax liability implied by the changes in benefits and earnings. The analysis includes both aggregate estimates and estimates for selected population subgroups.

- Increases in revenues fall far short of benefit increases for all proposals evaluated. When we consider removing the earnings test altogether and use our "best guess" work response assumptions, additional revenues cover only 15 percent of additional benefits. The remaining cost is 3.7 billion dollars (see Summary Table 1).

- We examine four plans to modify (rather than eliminate) the RET. Two plans involve increasing the annual exempt amount; the remaining two plans lower the age at which earnings become exempt. Comparisons are based on our "best guess" labor response assumptions. For each plan the first-year cost is less than half the cost of eliminating the RET and additional revenues are less than 20 percent of additional outlays.

- Those with high earnings gain most from elimination or liberalization of the test. For all proposals, using the "best guess" work response assumptions, net benefits (benefit increases minus tax increases) go primarily to upper-income families (those with incomes in excess of $33,000). For the total elimination plan 50 percent of net benefits go to families in the top income class--those with incomes in excess of $59,000 (see Summary Table 2). For all proposals, female-headed families do not fare as well in terms of net benefits as do male-headed families.

- Economic theory indicates that the RET affects the hours worked by older workers and that it may affect labor-force participation. Theory also suggests that, under the proposals examined here, some will increase their earnings, others will decrease their earnings, and that the net effect is ambiguous. Existing empirical research suggests that the effects are small, but their magnitudes have not been precisely measured to date. This study employs a range of possible work responses. Revenue increases are small relative to benefit increases under all response assumptions; however, revenue increases are highly sensitive to the labor-force participation assumption.

Summary Table 1.--Effects of modifying the earnings test: Aggregate effects by plan and work-response assumption, 1990.

[Amounts in millions]

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes	Net cost to government	Change in taxes as percent of change in benefits
Various plans for intermediate response						
Remove RET	$4301	$422	$573	$63	$3666	14.8
Increase exempt amount						
AEA = $20,000	1807	227	175	25	1607	11.1
AEA = $12,000	733	60	54	8	672	8.4
Lower exempt age						
Age = 67	1712	180	238	22	1451	15.2
Age = 69	529	105	89	12	429	19.1
Full-removal plan for various responses						
Intermediate	4301	422	573	63	3666	14.8
Other						
No response	4235	0	467	0	3769	11.0
Low response	4270	171	505	26	3739	12.4
OAct Assumption	4393	1992	824	348	3222	26.7
High response	4561	3387	1110	499	2951	35.3

Summary Table 2.--Effects of modifying the earnings test: Distribution of plan net benefits by plan and family income deciles, 1990

	Full removal	Exempt Amount =20,000	Exempt Amount =12.000	Exempt Age 67	Exempt Age 69
TOTAL (billions)	$3.7	$1.6	$0.7	$1.5	$0.4
Percent	100	100	100	100	100
Families grouped by preplan income deciles					
Lowest	0	0	0	0	0
Second	0	0	0	0	0
Third	0	1	2	1	2
Fourth	1	3	7	3	0
Fifth	2	4	6	1	1
Sixth	4	9	11	4	2
Seventh	7	14	15	10	10
Eighth	11	19	18	10	9
Ninth	23	26	22	21	30
Highest	50	24	19	51	47

Note: The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

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I. Introduction

Numerous proposals have been made to eliminate or liberalize the Social Security retirement earnings test (RET) for workers aged 65-69. The argument often underlying these proposals is that the test decreases the work effort and earnings of affected workers. Many proponents of the proposals claim that elimination of the test will result in large increases in earnings and that the accompanying increases in income and payroll tax revenues will offset a substantial portion of the increase in Social Security benefit outlays. Critics of these proposals argue that removing the RET will lead to only small increases in earnings, and hence only a small fraction of the increased benefits will be defrayed by increases in tax revenues. In addition, they argue that most of the resulting benefit increases will go to high-income families.

This paper uses the Social Security Administration's Simulated Tax and Transfer System (STATS) microsimulation model to examine both the aggregate and the distributional effects in the first year (1990) of changing the RET. Five proposals are considered--one involving full removal of the test, and the others modifying the test.

Three important features of this study are: First, as noted, a microsimulation approach is used. Second, earnings responses based on the economic literature are incorporated to estimate the effects of the proposals on aggregate earnings and tax revenues. Because of the imprecision of the economic estimates, the microsimulations use four sets of earnings assumptions. Third, the study examines the distribution of benefit and tax increases among family income classes and among selected demographic groups. [1]

The paper is organized as follows. Section II reviews the theoretical arguments concerning the influence of the RET on work decisions; it also provides the empirical basis for our work response assumptions. Section III describes the plans simulated, the simulation model and data used, and the procedures employed to simulate the RET proposals. Section IV presents estimates of both aggregate and distributional effects of the proposals simulated, under several work response assumptions. Conclusions are discussed in Section V. Two appendices contain detailed descriptions of the simulation procedures and additional estimates.

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1. There have been other recent efforts to assess the effects of altering or removing the RET for those between the ages of 65 and 69. A study by the Congressional Budget Office [1988] focuses on the number and characteristics of those affected by several RET proposals. It also presents estimates of the increases in aggregate benefit outlays. The estimates are based on the assumption of no earnings response. The Social Security Administration's Office of the Actuary (OACT) has made estimates of the net cost of similar proposals, incorporating induced changes in revenues estimated at the aggregate level.

II. The Earnings Test and Work Incentives

This section presents an economic analysis of the likely effect of the earnings test on work, and discusses several recent empirical studies that provide evidence about the nature and magnitude of its influence. A more comprehensive presentation of these issues and review of the research is presented in Leonesio [1988]. We begin with a brief description of the earnings test and a related provision, the delayed retirement credit (DRC).

A. Description of the RET and DRC

1. The Earnings Test

The earnings test currently allows a beneficiary to earn income only up to a specified annual limit, the annual exempt amount (AEA), without suffering a loss of benefits. Furthermore, if dependent benefits are based on the beneficiary's earnings history, these payments are also reduced if the beneficiary's earnings exceed the exempt amount. The dollar amount of the limit depends on the worker's age; for those under age 65, the 1988 figure is $6,120, and for those aged 65-69, $8,400. Workers aged 70 and over are exempt from the RET. These amounts are

increased yearly at the same rate as the increase in average wages.[2] In 1990, the 65-69 AEA is expected to be about $9,000. When earnings exceed the exempt amount, benefits are now reduced $1 for every $2 earned over the limit; beginning in 1990, benefits will be reduced $1 for every $3 of excess earnings. Thus, excess earnings will be subject to a benefit reduction rate of .33.

2. The Delayed Retirement Credit

The delayed retirement credit is another feature of the Social Security benefit structure which affects those who choose to take benefits after age 65. The DRC currently provides that benefits will be increased by 3 percent for each year a beneficiary postpones retirement beyond the normal retirement age of 65. The DRC is intended to provide an inducement for continued employment. However, it has been shown that, in terms of total benefits received over a lifetime, the 3 percent rate is not high enough to ensure that someone who defers taking benefits for a year will not suffer a reduction in the present value of real lifetime benefits. Under current law the DRC is scheduled to be gradually increased to 8 percent by the year 2008. An 8 percent DRC approximates the actuarially fair rate; that is, at that rate lifetime benefits will be approximately the same regardless of

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2. Social Security Handbook, 1986, pp. 253.

the age of benefit acceptance. The DRC is scheduled to rise to 3.5 percent in 1990.

B. Economic Theory and the Earnings Test

The labor supply of older workers has two important dimensions: 1) the number of people who choose to continue working at any given age, and 2) the number of hours worked by those who actively participate in the labor market. Elimination of the RET is likely to have an effect on both of these magnitudes. We analyze each in turn.

1. Who Will Work?

The number of elderly who continue as members of the labor force is largely the outcome of individual retirement decisions. For individuals planning to work after retirement, the existence of the RET lowers lifetime wealth and, therefore, reduces the means of financing retirement. Furthermore, since the RET lowers the net return to work in postretirement years, it provides an incentive to shift hours of work to preretirement periods. Some economists have argued that this shift can take the form of earlier retirement. Others have argued that the shift can take the form of a postponement of the transition from preretirement to part-time postretirement work, so that the removal of the RET could be expected to induce an earlier move to part-time work among this group of workers.

There are, however, two possible sources of increased labor force participation. First, if a retiree does not work because an employer requires a minimum number of hours that are unacceptably high, the elimination of RET might induce a nonparticipant to enter the labor market. Second, if there are significant fixed costs associated with work, such as commuting expenses or outlays for special clothing, removing the RET can result in labor market entry. In both cases the removal of the RET can sufficiently augment net pay to compensate for undesired overemployment or costs of work.

A further complication arises from the DRC. Delayed retirement credits are received not only for months of postponed retirement after 65, but also for months in which no benefit was paid because of the retirement test.[3] Even at the current DRC rate of a 3 percent increase in benefits per year of delayed retirement credits, the work penalty imposed by the RET is partly mitigated by the benefit increase due to the DRC. As the DRC rate rises toward 8 percent between 1990 and 2008, the effective work penalty will be reduced still further. If the 8 percent DRC rate is actuarially fair, then the DRC benefit increase will

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3. The number of months of delayed retirement credits given for RET reductions is roughly proportional to the benefit reduction as a proportion of the total benefits for the year. That is, if a beneficiary has half of one year's benefits offset because of the RET, he will get about six months of delayed retirement credits, resulting in a 1.5 percent increase in his benefit amount if the DRC rate is 3.0 percent per 12 months of credits.

fully compensate the average worker, over his lifetime, for any RET reductions between ages 65 and 69. For the worker who considers the total lifetime value of the benefits rather than the immediate RET reductions, the 8 percent DRC should therefore remove much of the influence of the RET on the decision to retire.

2. How Many Hours Will Working Retirees Supply?

The predicted impact of eliminating the RET on postretirement hours of work will vary depending on the pre-elimination level of earnings, and the extent to which workers are able to adjust hours of employment. Given a specific retirement date, four distinct cases merit discussion. First, for retirees with earnings below the exempt amount, removing the RET should have no effect on labor supply. These are people who receive full benefits and could already increase earnings without penalty. Second, for retirees with earnings equal to the exempt amount, the RET's elimination will increase the net reward for additional work, and this should lead to increased hours supplied to the market (substitution effect). Third, for retirees with earnings above the limit, but who receive some partial benefits, removing the RET will have an uncertain influence on work. Their nonlabor income will rise, increasing the means of financing retirement leisure, which tends to deter work effort (income effect). In contrast, however, the elimination of the benefit reduction rate

increases the reward for additional work, providing an incentive to increase work hours (substitution effect). The net effect on labor supply for this group depends on the relative strengths of these opposing effects. For earners just above the exempt amount, the substitution effect will tend to dominate, and the net effect will be an increase in work. If the income effect is strong enough, then there may be an earnings level above which the income effect will dominate, and the net effect will be a reduction in work. Whether the income effect could be so strong cannot be determined from theory, but must be empirically estimated. Fourth, for those retirees with sufficiently high earnings that all Social Security benefits have been lost, removing the RET should induce less work (due to the income effect); their nonlabor incomes will rise by the full monthly benefit amounts, but the net hourly compensation for work is unchanged.

To summarize the results, the overall effect of the RET on labor force participation and hours of work is theoretically uncertain. The predicted consequences of its elimination for particular subgroups are summarized in Table 1.

Table 1.--Theoretically predicted response to eliminating the earnings test

Impact on:	Effect on Work
Labor Force Participation	
due to:	
1. Hours constraints, fixed costs, change in retirement date	Ambiguous
Post-retirement Hours	
for retirees with:	
2. Earnings less than the limit,	No change
3. Earnings at or above the limit, full or partial benefits	
a. Earnings at limit, full benefits (substitution effect)	Work more
b. Earnings above limit, partial benefits (substitution and income effects)	Ambiguous
4. High earnings, insured with no benefits (income effect)	Work less
OVERALL IMPACT	Ambiguous

The net effect of eliminating the RET depends on how many people fall into each category, and the average size of the labor supply response within each group.

C. Empirical Evidence

Quantitative analysis of the work and retirement decisions of older Americans is a relatively recent line of research, most

studies having been completed during the past decade. The roles played by specific financial influences such as job offers, private pensions, and Social Security are not well understood. In general, financial factors appear to have predictable, but relatively small, consequences on the timing of retirement and choice of postretirement hours of work when compared with noneconomic influences such as age and health. The few studies that have examined the work patterns of older workers suggest that their labor supply determinants are very different from those of younger workers; the estimated responses of younger workers are likely to give misleading predictions of the behavior of older cohorts. Therefore, in attempting to incorporate labor supply responses of older workers to the elimination of the RET into the STATS model, we are faced with two options: 1) use the best available estimates from the many studies of younger workers, but acknowledge that they are somewhat inappropriate since they measure the behavior of a very different population, or 2) use the best available estimates from studies that have focused on the relevant population, but recognize that considerably more research needs to be done before a professional consensus emerges on the relevant empirical magnitudes. The latter strategy is adopted here.

To predict the effect of removing the RET on the labor supply of 65- to 69-year-olds, it is necessary to estimate how the basic decision whether to work at all might be altered, as well as

whether those people who remain in the labor force will change their hours of work. The existing economic literature was surveyed to determine what is known about the magnitudes of the "Effect on Work" entries in Table 1. Unfortunately, very few published results can be incorporated into the STATS model in a straightforward manner.[4]

1. The Earnings Test and Labor Force Participation

Periodic changes in RET rules have provided the best opportunities for studying its effects on labor force participation and reentry. Vroman [1985] notes that the annual earnings limit for retirees aged 65-71 was raised every year from 1973 to 1980, and he examines the labor force reentry rates in these years. He concludes that reentry rates appear unresponsive to changes in the annual earnings limit. Packard [1988] examines reentry of 70-year-old retirees after elimination of the RET for

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4. Most of the empirical research on work and retirement cannot be used for two reasons. First, the dynamic structure of many retirement models is incompatible with the static approach used in the STATS model. Economists usually model the retirement decision as one aspect of a set of choices where individuals are planning lifetime consumption and work patterns. Behavior during a specific year is largely determined by events in previous periods and those anticipated for future years. Policy changes in specific years, as analyzed in the STATS model, would be predicted to elicit changes in behavior over a number of years. The single-period analysis of the model cannot address these long run considerations. Second, the STATS model uses a specific dataset, the Current Population Survey (CPS), as the information source on the economic behavior of Americans. Since retirement research is usually based on other datasets, published statistical results often utilize information that is not recorded in the CPS and, therefore, not available in the model.

this age group in 1983. The number of men and women returning to the labor force increased slightly in 1983 and 1984 but fell back to former rates in 1985, the last year for which he has data. Thus, the two best sources of information on the effect of the RET on reentry rates give no indication that eliminating the RET would change reentry rates in a predictable direction. Vroman finds no response, and Packard's results are puzzling in that it is hard to attribute the short-term increase in reentry rates to the earnings test. This evidence on reentry rates suggests that the RET is not likely to have much effect on labor force participation rates.

Packard also tests for a link between the RET and the decision to work using statistics on labor force participation rates constructed from data from the Bureau of Labor Statistics (BLS) and from the Social Security Administration's (SSA's) Continuous Work History Survey (CWHS). He estimates that removing the RET for 70- and 71-year-olds was associated with a rise in the percentage of men participating in the labor force of between .39 and 2.18; for 70- and 71-year-old women the corresponding rise was .22 to 1.61 percentage points. These results are not estimated very precisely.[5]

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5. Given the marked declines in work observed as age increases, the 70- and 71-year-old cohorts are not the ideal age groups for observing the effect of the earnings test; workers who are aged 65-69 may be somewhat more responsive.

Several other researchers have examined the ways in which work and retirement decisions have been affected by the RET, but none contain quantitative relationships that can be readily incorporated into the STATS model for this application.[6] The studies by Vroman and Packard suggest that the impact on participation rates among 65- to 69-year-olds of eliminating the RET is likely to be very small.

2. The Effect on Hours Worked

A recent study of elderly labor supply behavior by Hanoch and Honig [1983] provides an attractive source of estimated responses that can be easily incorporated in the STATS model. In one of the most carefully executed contributions to the literature, Hanoch and Honig investigate the labor supply determinants of persons aged 58-69, using data from the Retirement History Study (RHS).[7] They conclude that economic factors explain the labor supply of the elderly only to a limited extent. Hours of work appear to be very unresponsive to short term changes in nonlabor income, and relatively insensitive to variations in wage rates.[8]

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6. For example, see Vroman [1971].

7. They estimate separate models for white, married males and unmarried females using observations from the 1969-75 period in the RHS.

8. Technical Footnote: Compensated substitution elasticities were .19 for males and .21 for females, while total income elasticities were -.02 and -.06, respectively.

Other studies have estimated the likely effect of the RET on retirees' hours of work, but are less useful in this application in that they are either somewhat outdated, or fail to provide sufficiently detailed measured responses that can be directly attributed to the test.[9]

To sum up, economic theory suggests a number of ways in which the RET might influence the retirement and work decisions of the elderly, but the overall effect on their labor market activity is ambiguous. Empirical research on the determinants of older workers' labor supply is in its early stages, and the effects of specific financial influences such as Social Security's RET have not been determined with much precision. At this time there is little evidence of an appreciable impact on choice of retirement date, or on the labor force participation decision of retirees. There appears to be only a moderate influence of the RET on post-retirement hours of work and earnings for the minority of retirees who continue working. Many factors influence the work-retirement decision, and the effect of the RET provision appears to be small relative to other factors.

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9. For example, Packard [1988], Burtless and Moffitt [1984, 1985], and Pellechio [1978] all find evidence that average hours of work among retirees would rise if the RET were substantially liberalized or abolished. There is no consensus on the amount of additional labor that would be forthcoming.

Given that the available evidence does not provide a consensus view of the effect of the RET on labor supply, the approach used in this paper is to provide simulations based on alternative labor supply responses, using evidence from some of the studies in this section. These alternative responses are discussed in Section III.

III. Description of the Study

A. The Proposals Simulated

This study examines five proposals for eliminating or modifying the RET in 1990. One proposal (the full-removal plan) calls for complete elimination of the RET for persons aged 65-69. Two proposals raise the annual exempt amount for persons aged 65-69 from $9,000 to $20,000 and $12,000, respectively; these are referred to as the AEA20 and the AEA12 plans.[10] Two proposals lower the RET exempt age from 70 to 67 and 69, respectively; these are referred to as the AGE67 and AGE69 plans. All these plans assume that the DRC will remain as currently scheduled (3.5 percent in 1990).

B. The STATS Model

1. Microsimulation

The STATS Model is a microsimulation model developed by the Social Security Administration's Office of Research and

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10. With wage indexing, an AEA of $20,000 in 1990 is approximately equivalent to an AEA of $25,000 in 1994. Some proposals for a phased-in increase or removal of the AEA have called for a $25,000 AEA by 1994.

Statistics.[11] The analysis of RET modifications makes full use of the STATS model's general capability of simulating several tax or cash benefit programs simultaneously, since the full evaluation of the effects or changes in the RET requires analyzing changes in Social Security benefits, Social Security payroll taxes, and federal individual income taxes, all of which are simulated in the model.

The STATS model uses a microsimulation approach: Information on individual households is used to calculate taxes or cash benefits, case by case. In a sense, each person or family undergoes a simplified version of the tax filing or benefit calculation process, with two differences. First, taxes or benefits are often calculated according to a specific policy proposal, instead of current law. Such policy simulation applications enable analysts to consider the effects of changing the way taxes or benefits are determined. Second, the information used by the STATS model to determine taxes or benefits was collected in a nationally representative survey of households. Changes in benefits or tax liability can be summed for population subgroups, yielding distributional results, or for the population as a whole, yielding estimates of aggregate costs or revenues.

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11. A description of the STATS model, as well as a discussion of how it is used to estimate the effects of policy changes on federal revenues and expenditures, is provided in Wixon, Bridges, and Pattison [1987].

2. The Current Population Survey

The primary source of information for the STATS Model is the March supplement to the Current Population Survey (CPS). The CPS is a nationally representative file based on interviews of over 50,000 households containing over 150,000 persons. The file includes the civilian noninstitutionalized population of the United States living in housing units and male members of the Armed Forces in civilian housing. The Bureau of the Census conducts the survey in March of each year and the resulting file is available within a few months; hence the CPS is a dependable source of up-to-date information. It provides data on: the relationships among persons within each household, prior-year employment, income from various sources for those 15 years of age or older, and demographic traits such as age, sex and race.

The March 1987 CPS file, containing 1986 income information, was projected four years forward using standard projection techniques. All plans are assumed to go into effect in 1990. We simulate the first-year effects of each plan.

Of particular importance for STATS simulation work is the income information. The record for each person on the CPS file contains that person's income for the preceding year, broken down into 22 types of income, including wages and salaries, self-employment income, several kinds of welfare income, Social Security benefits, several kinds of pensions income, and several other

kinds of possible retirement income like dividends, interest, and rent. This information in itself is sufficient for some simulations, but for a more complete treatment of some policy proposals some information has to be imputed[12] to the CPS from other sources, usually from administrative data.

3. Tax and Benefit Calculations

The tax and benefit calculations use the income information to calculate payroll taxes for each person, income taxes for each filing unit, and information on family benefits for each family containing persons with Social Security benefit income.

Payroll taxes are calculated by applying the scheduled 1990 payroll tax rates to covered wages and self-employment income of workers on the CPS, up to the annual taxable maximum. Whether a worker's earnings are covered is determined from CPS codes for industry and occupation; different types of jobs have different probabilities of being covered. (In RET simulations in which

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12. "Imputation" replaces missing person or family information with a definite value to be used in simulations. The simplest kind of imputation replaces the missing value with an average value. The simplest imputation for an annual benefit, for example, would be the average annual benefit tabulated from administrative data. More detailed imputations use averages tabulated according to the characteristics of the persons receiving the imputations, such as the average benefit for beneficiaries of the same age, sex, and marital status. Another level of imputation detail tabulates the distribution of values in the data, rather than the average value, and the imputation replaces the missing value with a value selected randomly from the distribution of values.

nonworking beneficiaries return to work, all new workers are considered covered.)

The information provided on the CPS allows a fairly complete calculation of the federal personal income taxes in each family. (Some important items, like capital gains, are missing, and some types of income are underreported on the CPS.) The STATS calculation roughly follows the federal tax-form calculations, adding up gross income (including taxable Social Security benefit income), subtracting exemptions, subtracting deductions (itemized deductions have to be imputed from Internal Revenue Service administrative data), and using the appropriate tax brackets and rates, depending on the marital status of the filing unit, to calculate the income tax. Several credits are calculated, including the credit for the elderly. Changes in either earnings or benefits in other parts of the STATS simulation will automatically have the appropriate effects in the income tax part of the simulation.

The Social Security benefit information on the CPS is more rudimentary, containing only the annual benefit for each beneficiary on the file. This is sufficient for cost-of-living adjustment simulations, but for simulations of other proposals that affect benefits some other information usually needs to be imputed.

C. The STATS Model Simulation of RET Modifications

Four work-response scenarios were constructed using different combinations of estimated effects: the "no-response", "low-response", "intermediate-response" and "high-response" scenarios. In our judgement, based on our examination of the economic literature, the intermediate-response scenario is the "best-guess" scenario. A fifth scenario, the "OACT-response" scenario, was constructed to conform to certain work-response assumptions developed by the Office of the Actuary for its estimates. The five scenarios and their underlying assumptions will be described in this section.[13]

Persons in the simulation file aged 65-69 are classified into four different groups, according to their expected reactions to an RET modification. These categories correspond to the categories in Table 1 in the theoretical discussion in Section II.B.

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13. The following discussion is based on Appendix A, which contains a more complete discussion of the simulation procedures.

Group 1. Nonworking beneficiaries: benefits with no earnings.

Group 2. Workers with earnings less than the exempt amount, with or without benefits.

Group 3. Beneficiaries with earnings greater than or equal to the exempt amount. (Some workers in this group have information in the CPS that indicates that they retired during the year and no longer work. In the simulation these are considered "grace-year" beneficiaries; the CPS benefits are treated as if they were all received after retirement; and the retirees are not subjected to any retirement test, before or after the RET modification.)

Group 4. Workers with earnings greater than the exempt amount, no benefits. (In the simulation, some of these will be entitled beneficiaries with fully offset benefits, some will be insured workers who have not yet applied for benefits, and a small fraction will be uninsured workers.)

The theory underlying the expected reactions in each of these groups is discussed in Section II.B. These reactions, which the STATS model seeks to simulate, are as follows:

Group 1. A possible labor-force participation effect. (This reaction is used only in the high- and OACT-response scenarios.)

Group 2. No effect.

Group 3. Mixed substitution and income effects. The substitution effect induces an earnings increase; the income effect moderates the substitution effect. The substitution effect will dominate at earnings just above the exempt amount. Unless the income effect is relatively strong, the substitution effect will dominate for all partially offset beneficiaries. (In the OACT scenario a fixed percentage increase in earnings is given to 60 percent of Group 3 workers.)

Group 4. Pure income effect: insured workers who get new benefits as a result of an RET modification will reduce earnings. (In the OACT scenario, some but not all such workers will reduce earnings.)

Workers in Groups 3 and 4 require a calculated or imputed benefit for the simulation of possible RET effects. The benefits for Group 3 workers are estimated by calculating the benefit offset each worker would have had, based on the CPS earnings, and adding this offset to the CPS benefit to obtain the benefit as it would have been before the reduction. Group 4 workers have an imputed benefit estimated from SSA administrative data which relates benefit awards to the last full year of earnings; this procedure gives higher imputed benefits to workers with higher earnings. A small percentage of Group 4 workers who could receive benefits under the RET proposal will choose not to receive benefits. (See Appendix A for details.)

The empirical evidence for the possible size of the possible work-response effects is discussed in section II.C. Most studies suggest no increase in the labor force participation rate for older workers as a result of removing the RET; this is the assumption used in the low- and intermediate-response scenarios.

For the high-response scenario, some of Packard's estimates were used for simulating the increase in aged labor force participation. Packard estimated a rise in the labor-force participation rate for 70- and 71-year-olds of 2.08 percentage points for males and 0.57 percentage points for females after the RET was removed for that age group in 1983. In the simulations a proportion of nonworking beneficiaries representing these percentage increases in the participation rate are returned to

work; these workers are given earnings equal to the median earnings for workers aged 65-69 with earnings above the exempt amount.

For the intermediate-response simulations, the substitution effect and income effect parameters estimated by Hanoch and Honig for the elderly are used to simulate the response of Group 3 and Group 4 workers.[14] These parameters have the effect of increasing the earnings of Group 3 male workers from 5.7 percent to 6.3 percent if the RET offset-rate is reduced from 33 percent to zero, and of reducing the earnings of Group 4 male workers by not more than 2.0 percent. (See Appendix A for the derivation of these figures.) In order to study the effects on the cost estimates of variations in these parameters, a set of high- and low-labor-supply response parameters is also calculated.[15] The low-effect parameters are designed to cause a smaller increase in earnings among Group 3 workers and a larger reduction in earnings among Group 4 workers (smaller substitution effect, larger income effect). The high-effect parameters are designed to have the opposite effect: greater earnings increases among Group 3 workers and smaller reductions among Group 4 workers (greater

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14. Technical note: The substitution effect parameter is the compensated-wage elasticity, calculated at mean hours and wages. The income effect parameter is the total income elasticity.

15. Technical note: The high- and low-effect parameters were calculated from the Hanoch and Honig estimates by varying the estimates by one estimated standard error.

substitution effect, smaller income effect). The low-effect parameters under an elimination of the 33 percent RET will cause an increase in earnings of 4.0 percent to 5.3 percent for Group 3 male workers and a decrease of not more than 4.0 percent for Group 4 male workers. The high-effect parameters will cause an increase of 7.3 percent for Group 3 male workers and no decrease for Group 4 male workers.

The work-response combinations used in the four non-OACT scenarios are as follows:[16]

Table 2.-- Work response scenarios

Scenario	Group 1	Group 3	Group 4
No-response	None	None	None
Low-response	None	Hanoch-Honig: Substitution effect (weakened) +Income effect (strengthened)	Hanoch-Honig: Income effect only (strengthened)
Intermediate-response	None	Hanoch-Honig: Substitution effect +Income effect	Hanoch-Honig: Income effect only
High-response	Packard: Labor-force increase	Hanoch-Honig: Substitution effect (strengthened) +Income effect (weakened)	Hanoch-Honig: Income effect only (weakened)

16. Group 2 is omitted from this table. As discussed in the text, there is no work response for this group.

The no-response simulation shows only the effect on benefits of reduced offsets for already-entitled Group 3 and 4 workers, plus new benefits for Group 4 workers who are induced to apply for benefits, along with increased income taxes on the benefits. The low-response and intermediate-response simulations show, in addition to the new or larger benefits among Group 3 and 4 workers, two different levels of earnings response by these same workers, with the ensuing effects on payroll taxes and income taxes. The high-response simulation shows an even larger earnings response among Group 3 and 4 workers, and adds a return-to-work response among some previously nonworking beneficiaries, with the ensuing taxes on both earnings and benefits for these beneficiaries.

An additional scenario, the "OACT-response" scenario, was developed to conform as much as possible to certain work-response assumptions used by the Office of the Actuary in its estimates of work-response effects. The OACT scenario is somewhat similar to the high-response scenario in that it allows a labor force participation response from nonworking beneficiaries and increases work among partially offset beneficiaries. Unlike the high-response scenario, it also reduces earnings among fully offset or nonentitled workers. The labor-force participation response operates similarly to that in the high-response scenario, except that different percentages of the workers are returned, and returned workers are given earnings equal to the

mean earnings for all workers, rather than the median earnings of 65-69-year-old workers earning above the exempt amount. Sixty percent of Group 3 workers are given a 25 percent increase in earnings. Forty-five percent of Group 4 workers are given an earnings reduction: for 28 percent of the group earnings are reduced by 5 percent, and for 17 percent of the group earnings are reduced by 16 percent. The imputed benefits given to this group of workers are the same as those given in the other scenarios.

Although the OACT scenario uses many of the benefit- and work-response assumptions developed by the Office of the Actuary for making its cost estimates of proposed RET plans, the aggregate benefit and tax estimates from the STATS model simulation will not match those of the Office of the Actuary for several reasons: (1) The numbers of affected workers and beneficiaries in the STATS model depend on CPS survey responses for earnings and benefits. If respondents fail to report earnings or benefits, or report them inaccurately, the STATS model estimate of the number of persons affected, as well as the estimate of the changes in benefits and taxes, can be affected. (2) The Office of the Actuary assumptions cannot completely be carried over into the STATS model because of differences between information on the CPS and information in the data used by the Office of the Actuary. (3) The STATS model and the Office of the Actuary use different

procedures for estimating the complicated interaction between RET modifications and the income tax.

In all scenarios, nonworking spouses do not have an earnings response. Members of working couples are assumed to make their earnings responses separately. In two-beneficiary couples (and in some other multiple-beneficiary households) the person with the highest benefit is identified as the primary beneficiary if his benefit is high enough relative to that of a possible auxiliary beneficiary; changes in earnings above the exempt amount for the primary beneficiary can then cause changes in payments to an auxiliary beneficiary, following the retirement-test offset rules for family benefits.

Because the base file is derived from 1986 earnings and benefits data when the RET benefit offset rate was $1 for every $2 of excess earnings, simulations of changes in 1990 are actually carried out in two steps: the first simulates the effects of changing the benefit offset rate from $1 for $2 to the scheduled 1990 rate of $1 for $3; the second simulation adds the effects of the proposed RET modification. The effects of the modification are then analyzed by comparing the second simulation with the first. Because different work-response scenarios have different effects in the first simulation, the initial amounts for benefits and earnings differ slightly when comparing different work-response scenarios.

D. Limitations

STATS modeling has some important limitations. Not all information necessary for simulating tax and benefit changes is present on the CPS, so that the accuracy of the simulation depends in part on the accuracy of any imputations and simplifications necessary to deal with the missing information. (The projection of the CPS, which can be considered a sort of imputation, introduces more uncertainty.) Furthermore, the CPS information that is present, such as annual earnings and benefits, is based on information supplied by survey respondents, and may be subject to nonreporting or underreporting.

Two important examples of information imputed in the simulation are the imputation of benefits for workers who might become beneficiaries when the RET is modified, and the imputation of earnings to beneficiaries who might return to work from full-retirement when the RET is modified. Although the benefit imputation uses SSA administrative data on the relationship between benefits and the last full year of earnings for new retirees as a whole, it is plausible that this information does not apply very accurately to that subset of retirees who have worked full-time past age 65. For the other group, the small fraction of retirees who might return to work if the RET is modified, there is no information on how high the average earnings of returned workers would be. (In the simulations in

this paper, the earnings imputation affects only the high-response and OACT simulations.)

There is evidence that both earnings income and Social Security benefit income are fairly well reported on the CPS, but we do not know if it is safe to assume that the underreporting that does exist is not particularly concentrated among the group of interest in this study: workers aged 65-69, particularly those who also have benefits. It is known that other nonearnings components of income like interest and rent income are not very well reported on the CPS; this underreporting will tend to lower our estimates of the taxation of benefits.

The limitations mentioned so far are inherent in making estimates from the CPS. To these must be added the large uncertainties introduced in modeling work responses to the RET, uncertainties that stem from the fragmentary nature of current empirical evidence, as was discussed in Section II.C.

IV. Empirical Results

This section begins with an examination of the effects of the five RET plans on aggregate benefits and tax revenues. The discussion centers on the predicted changes given the intermediate work-response scenario. The sensitivity of results to the work-response assumptions is discussed. This is followed by an analysis of the effects of the full-removal plan on particular economic and demographic groups.

A. Effects on Aggregate Benefits and Tax Revenues

1. Effects of the Various Plans in the Intermediate Work-Response Scenario

Full-removal plan: The net cost to the government (benefit increases minus tax increases) for this plan is $3.7 billion (Table 3, Figure 1a), more than twice the net cost for any other plan. Benefit costs rise by $4.3 billion; $1.5 billion or 36 percent of this $4.3 billion goes to new beneficiary families, i.e., families with no benefits under preplan law. Tax revenues increase by $.6 billion ($573 million from the Federal personal income tax and $63 million from the Social Security payroll tax). Thus the increase in tax revenues recoups 15 percent of the increase in benefit cost (Figure 1b). The net increase in

Table 3.--Effects of modifying the earnings test: Aggregate effects by plan and work-response assumption, 1990.

[Amounts in millions]

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes	Net cost to government	Change in taxes as percent of change in benefits
Various plans for intermediate response						
Remove RET	$4301	$422	$573	$63	$3666	14.8
Increase exempt amount						
AEA = $20,000	1807	227	175	25	1607	11.1
AEA = $12,000	733	60	54	8	672	8.4
Lower exempt age						
Age = 67	1712	180	238	22	1451	15.2
Age = 69	529	105	89	12	429	19.1
Full-removal plan for various responses						
Intermediate	4301	422	573	63	3666	14.8
Other						
No response	4235	0	467	0	3769	11.0
Low response	4270	171	505	26	3739	12.4
OAct Assumption	4393	1992	824	348	3222	26.7
High response	4561	3387	1110	499	2951	35.3

EFFECTS OF MODIFYING THE EARNINGS TEST:
NET COST BY PLAN, INTERMEDIATE WORK RESPONSE, 1990

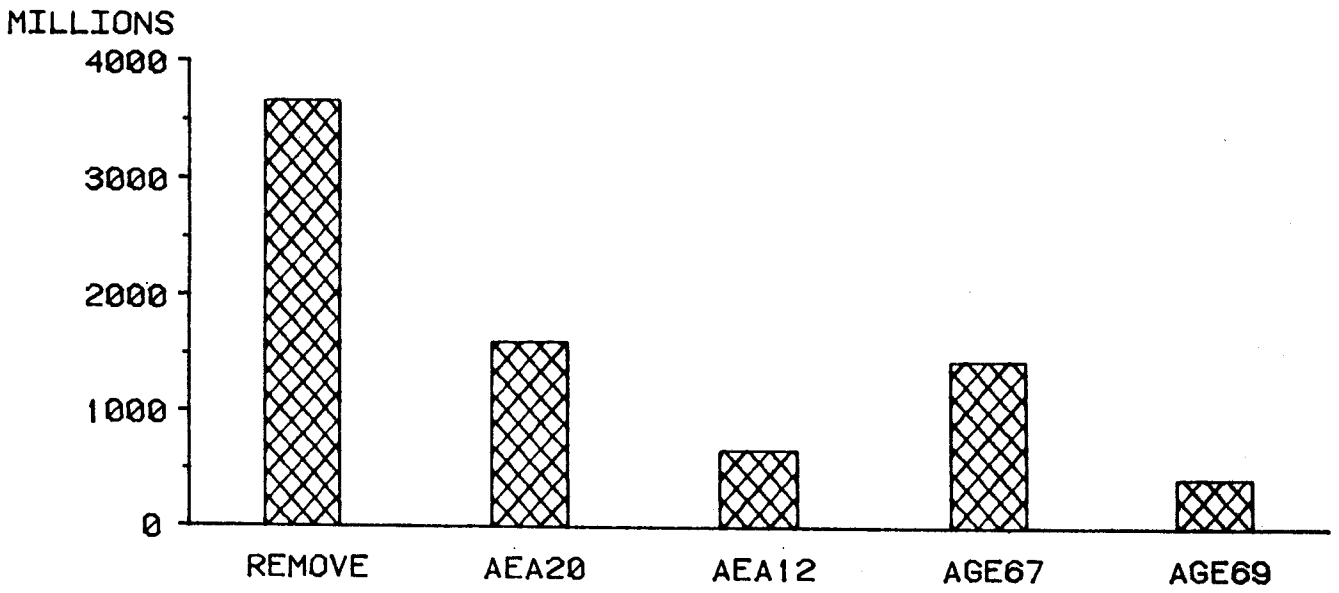

FIGURE 1A

EFFECTS OF MODIFYING THE EARNINGS TEST:
RECOUPMENT RATES BY PLAN, INTERMEDIATE WORK RESPONSE, 1990

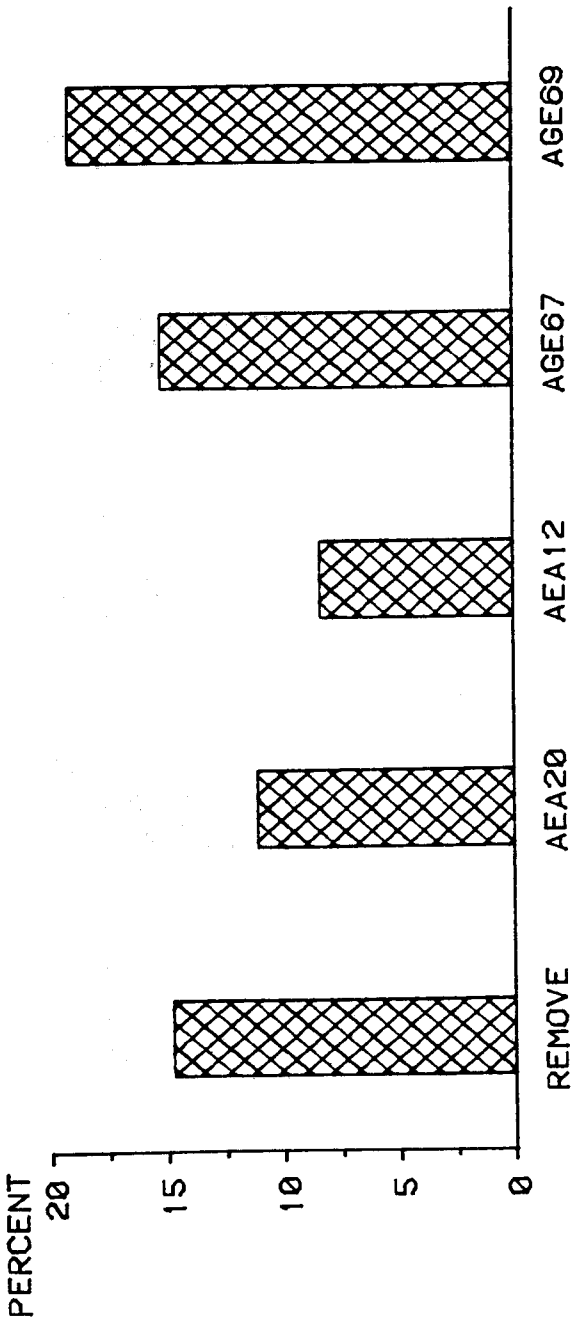

FIGURE 1B

earnings is $.4 billion representing an earnings increase of $.5 billion by some workers, which is partially offset by an earnings decrease of $.1 billion by others. The earnings increase causes all of the increase in Social Security tax revenues and part of the increase in income tax revenues. Most of the increase in income tax revenues (about $.5 billion) is the result of taxes on the increased benefits, and would have resulted in the absence of any change in earnings.[17]

Partial-removal plans: The net costs to the government for the partial-removal plans are $1.6 billion for the AEA20 plan, $.7 billion for the AEA12 plan, $1.5 billion for the AGE67 plan and $.4 billion for the AGE69 plan (Table 3, Figure 1a). The percentages of increased benefit costs recouped by tax increases (recoupment rates) are all below 20 percent: 11 percent for the AEA20 plan, 8 percent for the AEA12 plan, 15 percent for the AGE67 plan and 19 percent for the AGE69 plan. These differences in recoupment rates are to a considerable extent due to differences in the distribution of benefit increases among income groups.[18] Benefit increases are least concentrated in the top income classes for the AEA12 plan and next least concentrated for

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17. It is estimated that adding an increase in the delayed retirement credit to 8 percent in 1990 to this plan would decrease 1990 benefit costs and net costs by about $.4 billion.

18. Of plan benefit increases, new beneficiary families receive 26 percent for the AGE67 plan and 11-13 percent for the other three partial-removal plans.

the AEA20 plan. The concentrations for the AGE67 and AGE69 plans are similar to that for the full-removal plan. Because of the structure of the benefit taxation provisions and the progressivity of the income tax schedule, the higher the share of benefit increases going to the top income classes, the higher is the proportion of these benefit increases recouped by income taxes. Below certain income thresholds benefits are not taxed, and above these thresholds the percentage of benefits subject to tax rises with income.

2. Sensitivity of Effects of Full-Removal Plan to Work-Response Assumptions.

Here the sensitivity of aggregate results for the full-removal plan to work-response assumptions is explored. The intermediate work response lowers the net cost by $.1 billion to $3.7 billion from the $3.8 billion which results when there is no work response (Table 3, Figure 2a).[19] The recoupment rate rises to 15 percent from 11 percent (Figure 2b).

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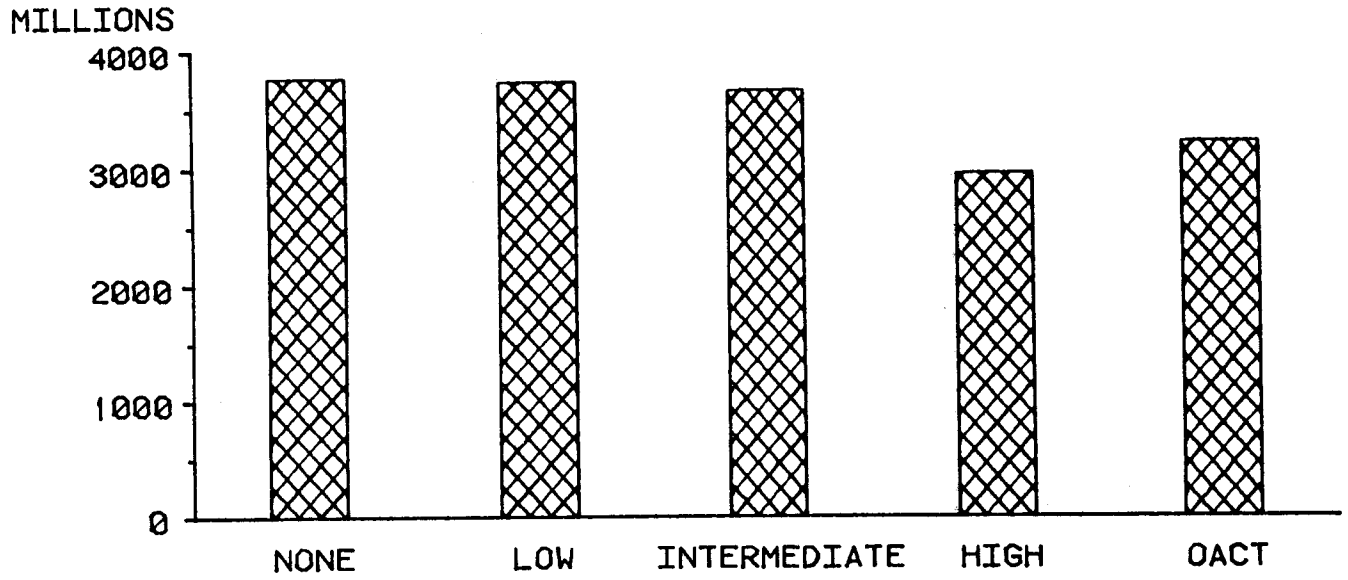
19. Benefit costs are affected by the work-response assumption, but are not as sensitive as tax revenues. This sensitivity of benefit costs operates as follows. Under current law the benefit reduction rate is scheduled to fall from one-half in 1986 to one-third in 1990. A separate projection of the CPS data from 1986 to 1990 is done for each work-response assumption. The projection for each scenario incorporates this benefit reduction rate decline and the accompanying work response. The larger the earnings increase due to this decline in the benefit reduction rate the larger is the amount of benefits withheld under the current-law RET, and thus the larger is the benefit cost increase due to removal of the RET.

EFFECTS OF MODIFYING THE EARNINGS TEST:
NET COST FOR FULL REMOVAL PLAN, BY WORK RESPONSE ASSUMPTION, 1990



WORK RESPONSE ASSUMPTIONS

FIGURE 2A

EFFECTS OF MODIFYING THE EARNINGS TEST:
RECOUPMENT RATES FOR FULL REMOVAL PLAN, BY WORK RESPONSE ASSUMPTION, 1990

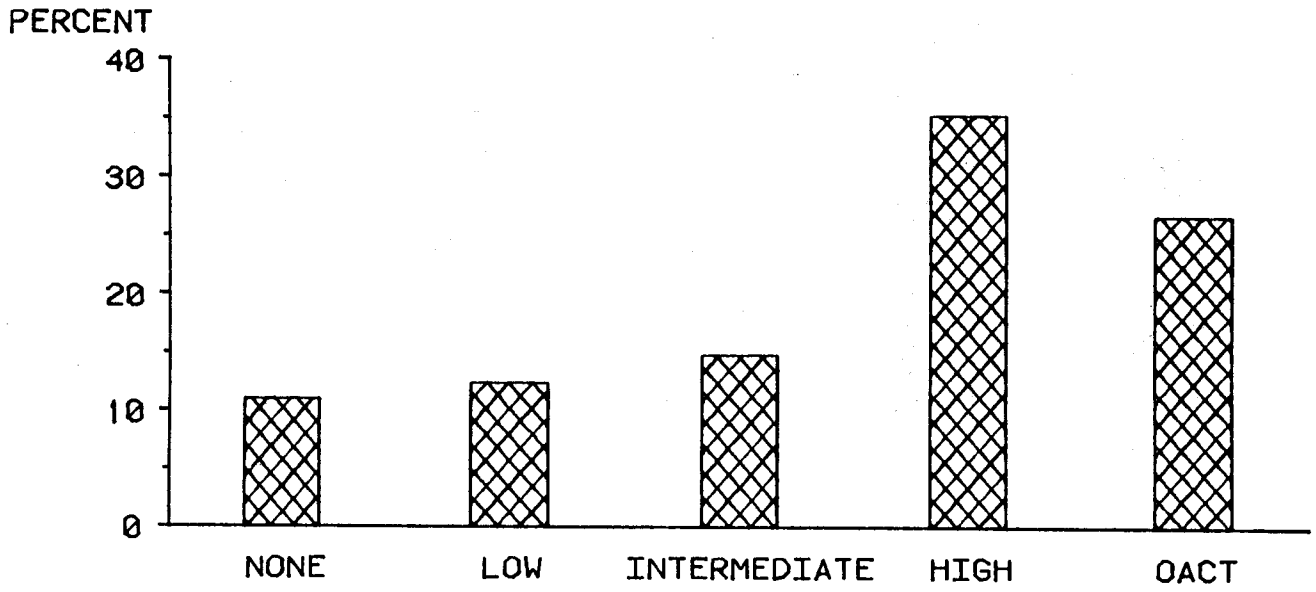


FIGURE 2B

The low-response assumptions produce an increase in earnings of less than $.2 billion and a recoupment rate of 12 percent. Earnings increases of $.4 billion are partially offset by earnings decreases of $.2 billion. By assumption there is no change in the number of workers.

The high-response assumptions produce a much larger increase in earnings ($3.4 billion) than do the intermediate assumptions ($.4 billion). Accordingly, the high-response scenario produces a much higher recoupment rate (35 percent versus 15 percent). The additional workers under the high-response scenario earn more than $1.8 billion; families with preplan earnings increase their earnings by almost $1.6 billion, as compared to an increase of $.4 billion for the intermediate-response scenario.

The OACT work-response assumptions produce a $2.0 billion increase in earnings and a 27 percent recoupment rate. This earnings increase is much larger than for the intermediate scenario but considerably smaller than for the high-response scenario. The additional workers under the OACT scenario earn $1.1 billion. The $.9 billion net increase in the earnings of families with preplan earnings is the result of increases of $1.6 billion partially offset by decreases of $.7 billion.

B. Effects on Economic and Demographic Groups

The effects of the five plans on particular economic and demographic groups are examined, using the intermediate scenario.[20] The focus is on the distribution of 1990 increases in benefits and taxes among these groups. In interpreting these data the reader should keep in mind that those receiving the benefit increases will lose delayed retirement credits for 1990 and hence will receive lower benefits in later years. Since the 1990 DRC is 3.5 percent compared to an actuarially fair DRC of 8.0 percent, the later-year benefit decreases will offset a bit less than one-half of the 1990 benefit increases.

Full removal plan: Aggregate net benefit to families equals aggregate net cost to the government.[21] The plan's net benefits to families (benefit increases minus tax increases[22]) of $3.7 billion go primarily to upper-income families. In Table 4 all

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20. It can be argued that for the distributional analysis in this section it would be preferable to use the no-response scenario results rather than the results for a scenario which incorporates work responses. Because the work response in the intermediate scenario is relatively small, distributional results for these two scenarios (no-response and intermediate-response) are very similar.

21. If the government wants to prevent the introduction of the plan from increasing the overall 1990 budget deficit, it must raise taxes and/or reduce some government expenditures. These tax increases would also impact on particular economic and demographic groups.

22. Includes increases in employer payroll taxes which are assumed to be borne by employees.

families with at least one person aged 65-69 at some time during 1990 are grouped into income deciles based on size of family income under current (i.e., preplan) law.[23] Table 4 and Figure 3 show that the top 10 percent of such families (those with 1990 incomes in excess of $59,558) receive 50 percent of net benefits and the next 10 percent (those with incomes of $41,934-59,558) receive 23 percent, but that the bottom 50 percent (those with incomes of less than $22,088) receive only 4 percent.

The primary determinant of the distribution of net benefits is the distribution of benefit increases. Of the benefit increase of $4.3 billion, 75 percent goes to the top two deciles, but only 3 percent to the bottom five deciles. Benefit increases go to those whose preplan earnings exceed the current-law annual exempt amount--those with partially reduced benefits under current law and those with no current-law benefits either because their benefits were totally withheld due to excess earnings or because they did not apply for benefits which would have been partially or totally withheld. Seventy percent of the net earnings increase of $.4 billion is accounted for by the top three deciles.

Female-headed families do not fare nearly as well as male-headed families under the plan (see tables in Appendix B). Female-

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23. The income boundaries of the deciles are actually for a slightly different group of families.

Table 4.--Effects of modifying the earnings test: Effects by family income deciles, 1990

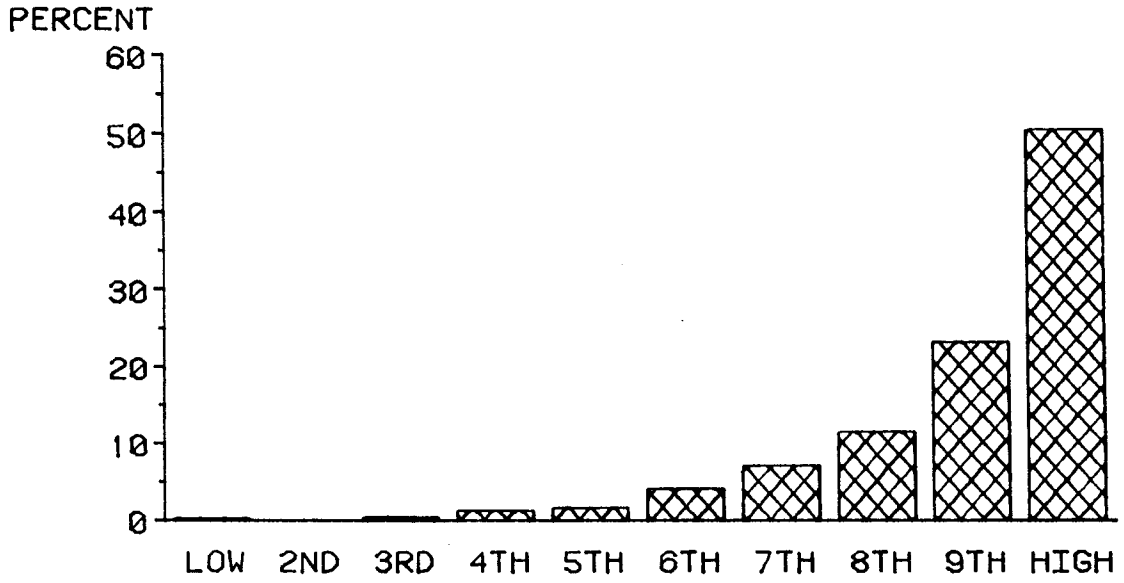
Plan: Full removal, 3.5% DRC; Work-response assumption: Intermediate

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes[1]	Net benefit
TOTAL (millions)	$4301	$422	$573	$63	$3666
Percent	100.00	100.00	100.00	100.00	100.00
Families grouped by preplan income deciles[2]					
Lowest	.22	-.05	.00	-.05	.26
Second	.00	.00	.00	.00	.00
Third	.41	.21	.35	.02	.43
Fourth	1.19	2.65	.75	2.74	1.23
Fifth	1.60	4.85	.61	4.79	1.70
Sixth	3.92	10.91	1.57	11.27	4.16
Seventh	6.42	11.51	2.84	1.24	7.07
Eighth	11.07	19.77	7.80	17.29	11.48
Ninth	23.44	27.52	24.42	27.31	23.21
Tenth	51.73	22.63	61.66	35.40	50.46

1 Includes employer share of the Social Security tax.

2 The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

PERCENTAGE DISTRIBUTION OF NET BENEFITS:
FULL REMOVAL PLAN, INTERMEDIATE WORK RESPONSE, 1990



FAMILY INCOME DECILES

FIGURE 3

headed families account for 30 percent of all families with a head or spouse aged 65-69, but receive only 16 percent of net plan benefits. This reflects sex-related differences in earnings levels. A higher proportion of male-headed families have earners with earnings high enough to be subject to the current-law RET and, hence, to receive benefit increases under the plan.

Families headed by widowed persons do not fare nearly as well as other families. Families headed by widowed persons account for 24 percent of all families with a head or spouse aged 65-69, but receive only 10 percent of net plan benefits.

Additional information on the effects of the five plans on particular economic and demographic groups is given in the appendix tables. For the various groups these tables show the proportions affected (i.e., having a change in income) by each plan and detailed information on the average effects for affected families.

Plans calling for increased Annual Exempt Amounts: The concentration of net benefits in the top deciles is less for the AEA20 and AEA12 plans (especially so for the AEA12 plan), than for the full-removal plan. For the AEA20 plan the top two deciles get 50 percent of net benefits and the bottom five deciles get 8 percent (Table 5). For the AEA12 plan the comparable figures are 41 percent and 15 percent (Table 6). Again, the primary determinant of the distribution of net

Table 5.--Effects of modifying the earnings test: Effects by family income deciles, 1990

Plan: Exempt amount = $20,000 Work-response assumption: Intermediate

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes[1]	Net benefit
TOTAL (millions)	$1807	$227	$175	$25	$1607
Percent	100.00	100.00	100.00	100.00	100.00
Families grouped by preplan income deciles[2]					
Lowest	.38	-.06	.00	-.09	.43
Second	.00	.00	.00	.00	.00
Third	.98	.39	1.13	.06	.98
Fourth	2.83	4.93	2.45	6.91	2.81
Fifth	3.78	9.00	1.99	12.10	3.85
Sixth	8.93	16.22	3.96	22.79	9.26
Seventh	13.29	16.25	6.49	-4.05	14.30
Eighth	18.51	25.48	14.98	27.91	18.75
Ninth	26.04	14.67	29.57	13.86	25.84
Tenth	25.26	13.12	39.42	20.51	23.79

[1] Includes employer share of the Social Security tax.

[2] The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

Table 6.--Effects of modifying the earnings test: Effects by family income deciles, 1990

Plan: Exempt amount = $12,000 Work-response assumption: Intermediate

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes[1]	Net benefit
TOTAL (millions)	$733	$60	$54	$8	$672
Percent	100.00	100.00	100.00	100.00	100.00
Families grouped by preplan income deciles[2]					
Lowest	.26	-.06	.00	-.07	.28
Second	.00	.00	.00	.00	.00
Third	2.41	1.46	3.68	.19	2.33
Fourth	6.87	15.11	7.39	17.79	6.70
Fifth	5.80	8.66	2.19	8.54	6.05
Sixth	10.54	18.29	4.08	21.58	10.93
Seventh	14.85	19.37	6.67	22.88	15.41
Eighth	17.02	17.97	12.04	6.64	17.54
Ninth	22.23	11.33	28.96	11.45	21.82
Tenth	20.03	7.86	34.98	11.00	18.93

[1] Includes employer share of the Social Security tax.

[2] The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

benefits is the distribution of benefit increases. As shown in Tables 5 and 6 the concentration of benefit increases in the top deciles is less for the AEA20 and AEA12 plans than for the full-removal plan. The smaller the increase in the AEA, the less benefit increases are concentrated in the top deciles.

Female-headed families do not fare as well as male-headed families under these two plans. Female-headed families account for 30 percent of all families with a head or spouse aged 65-69, but receive only 26 percent of net plan benefits under each of these two plans. Recall that for the full-removal plan they receive only 16 percent of net benefits.

Families headed by widowed persons account for 24 percent of all families with a head or spouse aged 65-69, but receive only 16-17 percent of net benefits under the AEA20 and AEA12 plans. Recall that for the full-removal plan they receive only 10 percent of net benefits.

Plans which reduce the RET exempt age: The concentration of net benefits in the top deciles for the AGE67 and AGE69 plans is similar to that for the full-removal plan and considerably more than for the plans which raise the AEA. For the AGE67 plan the top decile gets 51 percent of net benefits and the bottom five deciles get 4 percent (Table 7). For the AGE69 plan the comparable figures are 47 percent and 3 percent (Table 8).

Table 7.--Effects of modifying the earnings test: Effects by family income deciles, 1990

Plan: Lower exempt age to 67 Work-response assumption: Intermediate

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes[1]	Net benefit
TOTAL (millions)	$1712	$180	$238	$22	$1451
Percent	100.00	100.00	100.00	100.00	100.00
Families grouped by preplan income deciles[2]					
Lowest	.00	.00	.00	.00	.00
Second	.00	.00	.00	.00	.00
Third	.64	-.13	.36	-.16	.70
Fourth	2.37	3.15	1.27	3.89	2.53
Fifth	1.03	4.00	.52	4.34	1.06
Sixth	3.68	7.83	1.39	9.69	3.96
Seventh	9.13	12.15	4.08	14.51	9.88
Eighth	9.60	14.27	6.93	10.93	10.02
Ninth	21.92	28.81	24.42	33.80	21.33
Tenth	51.62	29.91	61.05	23.00	50.51

[1] Includes employer share of the Social Security tax.

[2] The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

Table 8.--Effects of modifying the earnings test: Effects by family income deciles, 1990

Plan: Lower exempt age to 69 Work-response assumption: Intermediate

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes[1]	Net benefit
TOTAL (millions)	$529	$105	$89	$12	$429
Percent	100.00	100.00	100.00	100.00	100.00
Families grouped by preplan income deciles[2]					
Lowest	.00	.00	.00	.00	.00
Second	.00	.00	.00	.00	.00
Third	1.99	-.20	.95	-.28	2.27
Fourth	.07	4.00	.71	5.57	-.21
Fifth	.90	4.37	.78	4.96	.82
Sixth	1.84	5.02	1.32	6.99	1.81
Seventh	8.67	4.88	3.14	6.80	9.86
Eighth	8.42	11.09	6.48	15.46	8.63
Ninth	30.41	31.28	31.48	44.83	29.80
Tenth	47.70	39.56	55.15	15.66	47.02

[1] Includes employer share of the Social Security tax.

[2] The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

Again, the primary determinant of the distribution of net benefits is the distribution of benefit increases.

The distributions of net benefits by income deciles for the five plans are shown side-by-side in Table 9.

Table 9.--Effects of modifying the earnings test: Distribution of plan net benefits by plan and family income deciles, 1990

	Full removal	Exempt Amount =20,000	Exempt Amount =12.000	Exempt Age 67	Exempt Age 69
TOTAL (billions)	$3.7	$1.6	$0.7	$1.5	$0.4
Percent	100	100	100	100	100
Families grouped by preplan income deciles					
Lowest	0	0	0	0	0
Second	0	0	0	0	0
Third	0	1	2	1	2
Fourth	1	3	7	3	0
Fifth	2	4	6	1	1
Sixth	4	9	11	4	2
Seventh	7	14	15	10	10
Eighth	11	19	18	10	9
Ninth	23	26	22	21	30
Tenth	50	24	19	51	47

Note: The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

V. Conclusions

Because Social Security benefits are now taxed, the proposals examined will increase tax revenues to some extent simply because they increase benefit outlays. In the absence of any work response, however, the additional revenues will be only a fraction of the additional outlays. Our estimates show that if the RET is eliminated altogether and if there is no work response, the additional tax revenues will defray only 11 percent of the cost of the additional benefits. Thus, the additional tax revenues implied by the proposals will cover a major share of the outlays only if the proposals elicit a sizeable increase in work effort by those between the ages of 65 and 69.

The estimates of changes in work effort are based on an examination of the few studies that consider the effects of the RET on retirement or hours-worked decisions by the elderly. Economic theory suggests that the RET affects the number of hours supplied by older workers and that it may affect labor force participation. Theory predicts that, under the proposals examined in this paper, some will respond to the increase in the net wage by earning more. Others, who receive a benefit increase, may have less need for earned income and may work less. In terms of theory alone, the net effect is ambiguous. The

existing empirical studies on the labor supply effects of the RET do not suggest a consensus on the magnitude of the effects; further research is needed. Nonetheless, the available studies indicate that these effects are small--that the labor market behavior of the elderly is relatively unresponsive to the financial incentives associated with the RET.

Due to the imprecision of these estimates and the importance of the work response in evaluating the changes in the RET, we estimate a range of possible work responses to changes in the RET. The response assumptions relate to both the hours worked by those already working and the number of labor force participants. The results appear much more sensitive to the labor force participation assumption than to the hours-worked assumption.

Based on our "best guess" or intermediate work response adjustment, increases in revenues fall far short of benefit increases for all proposals evaluated. When we consider total elimination of the earnings test, additional revenues in 1990 cover only 14.8 percent of the increase in benefits. The remaining cost is 3.7 billion dollars. The induced work response increases earnings by $.4 billion. Of the $.6 billion in additional tax revenues generated under this plan, 90 percent is collected via the income tax and 10 percent via the payroll tax. About 80 percent of the additional income tax collections

represent the tax on increased benefits; the balance, the tax on additional earnings, amounts to $.1 billion.

Using the same intermediate work response assumption, the first-year (1990) cost of each of the four plans to modify the RET is less than half the cost of total elimination. For each plan the revenue increase is estimated to be less than 20 percent of the additional outlays.

Given the structure of the RET, removing or liberalizing the test implies that only those with earnings above the current exempt amount will receive additional benefits. As a result, the plans are similar in terms of basic distribution effects. High income families receive most of the additional benefits, and families headed by women or by widows or widowers do not fare well compared to other groups.

Appendix A

Using the STATS model to Simulate the Effects of Changes in the Earnings Test

The simulations reported here were carried out on the file from the March 1987 Current Population Survey (CPS). The simulation population on this file contains 154,334 persons living in 61,943 families. The tabulation weight for each family was adjusted to make tabulations from the file reflect the expected 1990 population. In addition all income amounts on the file, which contain each person's income for 1986, were adjusted to reflect expected per capita income growth between 1986 and 1990. (The projection uses figures for projected population growth from the Office of the Actuary and for projected income growth from the Office of Management and Budget.) All simulations were carried out in 1990 dollars.

A. The Work-Response Scenarios

In the set of simulations reported here, several scenarios for possible work responses to an elimination or modification of the retirement test were implemented. They are referred to here as the "no-response" scenario, the "intermediate-response" scenario, the "low-response" scenario, and the "high-response" scenario.

A fifth scenario, the "OACT" scenario, was also developed to facilitate comparison with some of the estimates made by the Office of the Actuary.

The no-response scenario allows benefits to increase for workers with partially reduced benefits, and allows some previously fully reduced or nonentitled workers to take new benefits, but does not simulate any work response to these benefit changes. The low-, intermediate- and high-response scenarios are designed to give a notion of the range of possible work responses that can be supported by the econometric literature. The intermediate-response scenario uses labor-supply elasticities from a study of labor-supply responses among the elderly (Hanoch and Honig [1983]. The low-response scenario uses the same elasticities, adjusted downward (that is, in the direction of smaller earnings increases) by one standard deviation. The high-response scenario uses the same elasticities adjusted an equal amount upward, and in addition allows some nonworking beneficiaries to return to work in response to the RET elimination.

B. Initial Imputations

Two initial imputations were made to persons on the CPS file to clarify eligibility for the earnings test. The CPS gives only the age in years for each person at the time of the survey, which is in March following the income year. A 65-year-old on the CPS file, for example, might have turned 65 between December and the

time of the survey, and therefore would have been 64 during the whole simulation year. At the other end of the earnings-test age range, a CPS 70-year-old could have just turned 70, in which case he would have been subject to the earnings test for the whole simulation year, or he could have turned 70 as early as March of the simulation year, in which case most of his earnings and benefits would have been exempt from the test. To insure that the proper proportions of 65- or 70-year-olds are included or excluded from the effects of changing the retirement test, an exact month and day of birth are imputed to each person within the limits set by the CPS age.

The second initial imputation is a "grace year" indicator. If a CPS person on the March 1987 survey worked only part of the year in 1986, the reason for his not working is asked. The same question is asked for those not working in March. If a person did not work for part of 1986, and was not working in March 1987, and gives the reason for not working in both periods as "retired", then he is considered to have retired during 1986. In particular, if the worker has benefits in addition to his earnings, he is assumed to have earned the earnings before retirement, the benefits after, and is assumed to be subject only to the monthly earnings test under the grace-year provision. This assumption eliminates many of what would otherwise appear to be cases of beneficiaries with unfeasibly high earnings.

C. Benefit- and Work-Response Groups

All persons who might be affected by the retirement test (in the proposals simulated here, all persons aged 65-70 at the end of the year) are divided into five groups, depending on their 1986 earnings and benefits and on the retirement-test exempt amount in 1986:

Group 1: Benefits, no earnings.

Group 2: Earnings between zero and the retirement-test exempt amount, with or without benefits.

Group 3: Benefits, with earnings greater than or equal to the exempt amount.

Group 4: No benefits, earnings greater than the exempt amount.

Group 5: All others (zero earnings and zero benefits, or earnings less than zero).

Persons in Groups 2 and 5 will have no benefit or work response. Workers in Group 3 can have a larger benefit if the RET is modified. Workers in Group 4 can get a new benefit. Workers in Groups 1, 3, and 4 can have a work response. These responses will be discussed group-by-group in the following sections.

D. Simulation of Benefit Acceptance

Group 3 and Group 4 workers can get larger benefits or new benefits under a modification of the RET. If there were an increase in the delayed retirement credit, particularly if it were raised to 8 percent per year, some observed Group 3

beneficiaries might elect to postpone applying for benefits. The STATS simulation contains a benefit acceptance calculation for these Group 3 workers, using assumptions developed by the Office of the Actuary for its estimates, to reduce the number of Group 3 filers as the DRC is raised toward 8 percent. The parameters used in this calculation are not reported here because all the RET modification plans analyzed in detail hold the delayed retirement credit constant at its currently scheduled 1990 value.[24]

Group 4 workers require a benefit-acceptance calculation even when the DRC is held at its scheduled level. These workers are divided into three groups. The first is a group of uninsured workers, designated by randomly selecting seven percent of the Group 4 workers (the seven percent figure comes from Social Security Administration (SSA) administrative data for the proportion of the elderly population that is not insured).

Of the remaining Group 4 workers, a second group is formed consisting of those whose earnings are low enough that their benefits would not be fully offset under the current-law RET. Under a full removal of the RET, 89 percent of this group will apply for benefits if the DRC does not change. (The 89 percent

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24. The simulations do incorporate the effect of the rise in the scheduled delayed retirement credit from 3.0 percent in 1986 to 3.5 percent in 1990, but this effect is calculated before calculating the RET modification effects in 1990.

figure is derived from an assumption used by the Office of the Actuary). For simulations of partial elimination of the RET, or of an increase in the DRC, this percentage is reduced, using a procedure described in Section E.

The final group is formed from the remaining Group 4 workers--those insured workers with earnings high enough that all of their benefits would be fully offset under the current-law RET. The Office of the Actuary, in one of its estimates, divided this group into: (1) those who were already entitled, but whose benefits were fully offset, of whom all would receive benefits if the RET were fully removed, and (2) a group of insured but not yet entitled workers, of whom 89 percent would apply for benefits if the RET were fully removed. Because the STATS model simulation has no information on whether such workers are entitled yet, they are randomly allocated into the two groups and the appropriate benefit-acceptance probability is calculated. Under partial-elimination plans the acceptance probability is reduced, using a procedure described in Section E.

No effects on benefits are simulated for workers in Groups 2 and 5.

E. Simulation of Partial Elimination Plans

The simulation of benefit acceptance, described in Section D, and the simulation of several of the work responses, to be described

in Sections F and G, use parameters that were developed for estimating the effects of full removal of the RET.[25] For the simulation of plans which lower the exempt age, these same parameters are used, restricted to the appropriate ages. For simulation of plans which raise the exempt amount, however, the parameters are altered, scaled in such a way that the following criteria are met: (1) if there are no changes in the RET provisions, there will be no change in earnings or benefits; (2) if there is a full elimination of the RET, the full effect of the parameters will be used; and (3) partial changes in the RET provisions use parameters scaled in such a way that small changes in the provisions cause small changes in the probabilities or amounts of simulated benefit and work responses.

For most of the effects simulated, the scaling is done by calculating three different benefit offsets: the offset under current law, the offset under the proposed partial elimination, and the offset (always zero) under full elimination. For Group 1 workers, calculating these potential offsets requires using the imputed potential earnings. For Group 4 workers, calculating the potential offsets requires using the imputed potential benefits. As an example of how the parameter-scaling algorithm works, a Group 1 worker under current law might have an offset, if he

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25. Many of the parameter-scaling procedures described in this section were developed for combinations of work-response scenarios and partial-elimination plans not described in this paper.

returned to work at his imputed earnings, of $3,000. If the AEA is raised, this offset might fall to $2,000. Under full removal the offset would be zero. The partial-removal plan thus goes one-third of the way to full removal for this worker, and his chance of returning to work under the partial-removal simulation would be one-third the chance of returning to work under the full-removal simulation.

This kind of scaling is used for the benefit-acceptance simulation in all scenarios, including the OACT scenario described below. It is also used for the labor-force-participation response among Group 1 workers in both the high-response and the OACT-response scenarios. The elasticity-based responses for Group 3 and 4 workers used in all but the OACT scenarios require no scaling. The same responses in the OACT scenario, however, require scaling. For Group 4 workers, the scaling is done according to the proportional reductions in potential benefits, as described above. For Group 3 workers, however, the scaling is done according to proportional changes in the RET benefit offset rate. If a worker is above the annual exempt amount under both current law and the proposed plan, there will be no work response for him in the OACT scenario, but if he is over the exempt amount under current law and under the exempt amount under the proposal, the effect will be the same as under full elimination.

A similar kind of scaling, not described here, is used to simulate increases in the DRC. Increases in the DRC above the current-law amount have the affect of reducing the benefit acceptance probabilities, with a maximum reduction defined for a DRC of 8 percent, and intermediate reductions interpolated between the current-law acceptance probabilities and the 8 percent DRC acceptance probabilities.

F. Simulation of Work-Responses

The work-response simulation of Groups 1, 3, and 4 for the low-, intermediate- and high-response scenarios will be discussed in this section. The simulation for the OACT scenario will be described in Section G.

Group 1: Labor-Force Participation Response

This group, the nonworking beneficiaries, is the largest in the 65-69 age group. Benefits for this group would not be affected by a change in the RET, but for some of the beneficiaries a reduction in the RET, because it would give them a higher total of earnings and benefits if they continue at work, might induce them to postpone retiring or to return from retirement to work. Only a fraction of the group would return to work if the RET were eliminated, but there is very little econometric evidence for how large this fraction might be. The effects on taxes from a 1 percent increase in the labor-force participation rate in the

65-69 age group would be appreciable in the context of these simulations, but a 1 percent change is small relative to unexplained fluctuations in the participation rate in this group. Given the uncertainty of this labor force effect, the best that can be done is to give simulations for several possible work responses.

For the low- and intermediate-response scenarios, no labor-force participation response is simulated. The high-response scenario uses regression estimates made by Packard [1988] of the effect on 70-71-year-old labor-force participation of the 1983 elimination of the RET for that group. Packard made several estimates; the ones used here are the best estimates for the change in the Bureau of Labor Statistics (BLS) participation rate:

Male	2.08 percentage points
Female	0.57 percentage points.

Because the proportion of the population that doesn't work increases with age, simulation of a given increase in the participation rate requires returning a larger proportion of the younger beneficiaries to work. The Packard estimates return the following proportions of nonworking beneficiaries to work under the full-removal plan:

	MALE		FEMALE	
Age	Married	Unmarried	Married	Unmarried
65	3.61%	2.67%	0.72%	0.80%
66	3.38	2.83	0.66	0.81
67	2.96	3.03	0.69	0.76
68	2.86	2.62	0.59	0.73
69	2.82	2.99	0.62	0.67

For simulations of partial-elimination plans these percentages are adjusted downward, using the method described in Section E.

For those who are selected to return to work, an annual earnings amount must be simulated. In theory, the annual earnings of a worker who returns to work should be above the annual exempt amount, because there is no disincentive to labor-force participation for workers with earnings below the exempt amount. There is almost no basis from existing studies for further determining the appropriate level of earnings for these returned workers. For these simulations, workers were given annual earnings equal to the median earnings of workers with earnings above the exempt amount, for age 65-69 workers in the same sex and marital-status category. These median earnings, in 1990 dollars, are:

	Married	Unmarried
Male	$29,781	$19,070
Female	17,873	17,130

Within a given sex/marriage category, the same amount is given to all beneficiaries who return to work. If a more realistic simulation were made, distributing the simulated amounts around the average amount, larger income tax effects could be expected because of the progressivity of the income tax rate structure. We did not have sufficient data for constructing such a distribution.

Group 2: Workers With Earnings between Zero and the Exempt Amount

Because earnings below the exempt amount are unaffected by the retirement test, Group 2 workers are not given a work response in any of the simulations.

Group 3: Beneficiaries with Earnings at or above the Exempt Amount

Beneficiaries whose 1986 earnings were above the 1986 exempt amount are assumed to have had partially offset benefits. For these beneficiaries, the presumed offset can be calculated from the 1986 RET provisions, giving a full nonoffset benefit. Any new RET provisions can then be simulated using the projected earnings and projected full benefit.

The work responses for this group combine the labor-supply income effect due to the higher benefits with a substitution effect due

to the higher net-of-offset wage these workers receive when the RET offset is eliminated. (For plans in which the exempt amount is raised but the offset rate is not changed, there will be an income effect only for those workers with earnings above both the old and the new exempt amounts.)

The substitution and income effects are simulated using labor-supply elasticities estimated for the elderly in Hanoch and Honig [1983]. The income effect is incorporated by using a "total income" elasticity, E_Y, measuring the effect on current hours worked of a change in income (an E_Y of -.01 would mean that an income increase of 1 percent of earnings would cause the worker to reduce his earnings by .01 percent). The substitution effect is incorporated by using a "compensated wage" elasticity, E_W, measuring the effect on current hours worked of a reduction in the offset rate. (In 1990, the scheduled offset rate will be reduced from .50 to .33; each proposed plan will reduce this rate to zero for some or all 65-69 workers. An E_W of .01 would mean, in the RET context, that a reduction in the offset rate of one percentage point would cause a worker to increase his earnings by .01 percent. A reduction in the offset rate of 33.3 percentage points will cause an increase in earnings of 33.3 * E_W.)

The elasticities used in these simulations, from Hanoch and Honig [1983, p. 144], are:

	E_W	E_Y
Male	0.19	-0.02
Female	0.21	-0.06

These estimates are used for the intermediate-response scenario. For the high-and low-response scenarios these elasticities were changed by one standard error in the estimates. (The standard errors were, for the male and female wage elasticities, respectively .03 and .07, and for the male and female income elasticities, .02 and .06.) For the high-response, the male wage elasticity is .22, the female is .28, and both income elasticities go to zero. For the low response, the male wage elasticity is .16, the female is .14, and both income elasticities are doubled.

For each Group 3 worker in the simulation, two values are calculated, DTAX and DOFFSET. DTAX is the change in the offset rate for that worker under the simulated plan. For a change in the offset rate from .33 to zero, DTAX would be -.33. DOFFSET is the change in the benefit reduction between current law and the the proposal, equal to the negative of the benefit increase for all affected workers. The percentage change in earnings is then given by

$$\%ch(EARNINGS) = (-E_W * DTAX - E_Y * DOFFSET/EARNINGS) * 100.$$

The first term (E_W * DTAX) is the substitution effect, the second is the income effect. Because of the smallness of E_Y relative to E_W, the main effect here is the substitution effect. For a reduction of the offset rate from 33 percent to zero, this term gives an increase in earnings of 6.3 percent for males. The total effect will be somewhat smaller, because of the E_Y term.

Group 4: High earners with no benefits.

This group is assumed to contain three types of workers: uninsured workers, workers who have already applied for benefits but have full offsets to them because of their earnings, and workers who have not yet applied for benefits.

As stated earlier, a group of workers representing uninsured workers is identified by randomly selecting seven percent of the group; they are eliminated from further consideration. For the remaining workers, a potential benefit must be imputed. The benefits are imputed from SSA administrative data on the distribution of replacement rates: the imputation gives the benefit as a ratio to earnings; this ratio is then multiplied by the worker's earnings to get his imputed benefit, and a maximum on the imputed benefit is imposed.

Not all of the workers in the group are expected to accept the benefits even if the RET is eliminated. The benefit-acceptance

response is discussed in Section D. Of those who do accept, there may be a work response. The work response in this group, if it exists, is expected to be negative, since the elimination of the RET gives these workers more income without affecting their net wage, and the income effect is, if anything, negative, in the sense that an increase in income is likely to induce workers to choose more leisure and less work.

To simulate the income effect, the same labor-supply elasticities used in Group 3 are applied, except that the wage elasticity--E_W--and the change in the offset rate, DTAX, are not relevant for this group. The change in the offset, DOFFSET, is simply the negative of the new benefit that the worker might receive. The percentage decrease in earnings is given by the the following formula:

$$\%ch(EARNINGS) = (- E_Y * DOFFSET/EARNINGS) * 100.$$

Because E_Y in the intermediate scenario is -.02 for men and -.06 for women, the decrease in earnings is always less than 2 percent for men and less than 6 percent for women (using the assumption that the new benefit is always less than earnings for these workers). In the low-response scenario, E_Y is -.04 for men and -.12 for women. In the high-response scenario it is zero for both, meaning that there is no income response.

Group 5: Group 5 workers include workers with negative earnings and persons with neither earnings nor benefits. No work-response effects are simulated for them.

G. The "OACT" scenario

The OACT scenario is a set of assumptions developed to be as consistent as possible with a working set of assumptions developed by the Office of the Actuary for making its estimates of benefit and work responses to an RET elimination. The STATS model estimates, even when using the OACT scenario, will differ from the Actuary's estimates because: 1) different data sets, with different numbers of affected workers and beneficiaries and different amounts of benefits and earnings, are used; 2) the response assumptions used in our OACT scenario cannot duplicate completely the assumptions used by the Actuary; and 3) the STATS simulation has a much more detailed estimate of the changes in income taxation, particularly in the taxation of benefits.

The OACT scenario uses the same breakdown into groups as the other scenarios. As in the other scenarios, Group 2 and Group 5 workers have no effects. Group 3 and Group 4 workers can have changed benefits, using the same benefit-acceptance calculations as are used in the other scenarios. The work responses for Group 1, 3, and 4 workers will be described in this section.

Group 1: The Office of the Actuary made its estimates under the assumption that the following percentages of nonworker beneficiaries would return to work under full elimination of the RET:

Age	Recently worked	No recent work
65	5.0%	1.7%
66	3.6	1.2
67	3.0	1.0
68	2.7	0.9
69	2.5	0.8

For the STATS model simulation, these percentages were modified in the following way. Because the CPS does not have a corresponding recency-of-work indicator, a weighted average of the Actuary's two estimates was used for each age group on the CPS. The resulting parameters are:

Age	Percent returning to work
65	2.40%
66	1.44
67	1.14
68	0.94
69	0.83

Following the the assumption used by the Office of the Actuary, each returned worker is given earnings equal to the average earnings for all workers.

Group 3: For the OACT scenario, 60 percent of the group is expected to show a work response; for those who do the response is to increase earnings by 25 percent. The average increase in earnings over the whole group is therefore .60 times 25 percent, or 15 percent. This average increase of 15 percent is larger than the increase of about 9.5 percent that the intermediate-response scenario will show for the full elimination plan. The OACT scenario can therefore be expected to show larger effects for this group. In addition, because the OACT scenario splits the average effect between one subgroup with no effect and the other subgroup with a larger-than-average effect, the OACT income tax effects will be still larger due to the progressivity of the income tax structure.

Group 4: The Office of the Actuary simulates the income effect on nonbeneficiary workers by giving 40 percent of the nonentitled workers a 5 percent earnings reduction and 60 percent of the entitled but fully offset workers a 16 percent earnings reduction. Because the STATS model simulation has no direct information on whether a worker with no benefits is nonentitled or fully offset, the Office of the Actuary's numbers were combined in a weighted average to give the following figures to apply to the group as a whole in our OACT scenario:

28 percent reduce earnings by 5 percent
17 percent reduce earnings by 16 percent
55 percent do not change their earnings.

The average earnings decrease for our OACT scenario is 4.1 percent. In comparison, the intermediate-response scenario has a maximum earnings reduction of something less than 2 percent for men, so that the OACT scenario should show larger earnings decreases for this group than does the intermediate scenario. In addition, because the OACT scenario distributes the average change, with most earners not changing their earnings at all but with the rest changing by higher than average amounts, OACT income tax decreases should be correspondingly larger because of the progressivity of the tax structure.

H. Simulation of Married Beneficiaries and Beneficiary Families

If both members of a married couple have benefits, and if neither one's benefit is less than .6 of the other's benefit, then they are assumed to be independently entitled, and the simulation of the offset calculations and benefit and work responses is carried out independently, using the procedures described above. (The .6 ratio is used as a screen for spouse benefits, rather than a more exact .5, to allow for CPS rounding.) If one member is a beneficiary and the other is a nonbeneficiary, the same assumption is made. If both are beneficiaries, and one has benefits less than .6 of the other's, then the one with the smaller benefit is assumed to be an auxiliary beneficiary with no retired-worker entitlement. If both are nonbeneficiaries, and at least one has earnings, then the one with the higher earnings is

considered the primary beneficiary and the one with smaller or no earnings the auxiliary beneficiary.

For families with primary and auxiliary beneficiaries a total offsettable benefit is calculated, summing up all the benefits (or potential benefits) payable on the primary beneficiary's account. This total benefit, rather than the primary's own benefit, is used whenever the total potential offset is a factor in simulating the primary beneficiary's benefit- or work-response (such as in the total-income elasticity component of the Group 3 work response). If the primary rejects or accepts benefit entitlement, the auxiliary follows suit. In Group 1 families, the primary can return to work but the auxiliary (by assumption) cannot. Group 3 and Group 4 auxiliaries can have earnings responses; auxiliary offset calculations and earnings responses are made after the responses of the primary are determined; the primary's RET offsets, if there are any, are applied not only to his benefit but also in equal proportion to the auxiliary benefit; the offsettable benefit used by the auxiliaries in their calculations is what is left over after this reduction from the primary's offset.

I. Simulation of 1990 effects

Because the base file for the current simulations reflects earnings, benefits, and labor-force participation in 1986, a

preliminary simulation has to be done to take account of changes in the RET provisions between 1986 and 1990. These changes are a rise in the RET exempt amount because of indexing, a fall in the RET offset rate from 50 percent to 33 percent, and a rise in the DRC from 3.0 percent to 3.5 percent. The reduction in the offset rate (and to a small extent the increase in the DRC) has the effect of partially removing the 1986 RET. Each behavioral response scenario requires its own 1990 simulation, so that the "pre-elimination" simulation, from which changes are measured for each family in the simulation, varies from scenario to scenario. If the simulations had been run for 1989 rather than 1990 the aggregate plan effects would in general have been larger.

APPENDIX B: ADDITIONAL ESTIMATES

Notes to the Tables:

- "Benefits" refers to the sum of OASDI benefits and railroad retirement benefits.

- "Income taxes" refers to Federal personal income tax liability.

- "New beneficiaries" includes newly entitled beneficiaries as well as already-entitled beneficiaries with full reductions due to the earnings test.

Tables of Estimates by Demographic and Financial Characteristics

- "Affected families" refers to families whose family benefits change (this may mean someone in the family began to take benefits after modification of the earnings test) or whose family earnings change.

- Changes in benefits, earnings, and tax liability for the family are the sum of changes for all family members.

- Column 2: Number of affected families, divided by column 1.

- Columns 3,4,5,6: Average benefits, earnings, and tax liability of all family members under current law.

Tables with Aggregate and Decile Estimates

- Column 5: (Column 1 minus the sum of columns 3 and 4).

Table A1.--Effects of modifying the earnings test on families with head or spouse aged 65-69, by demographic and financial characteristics, 1990[1]
Plan: Full removal, 3.5% DRC — Work-response assumption: Intermediate

	Number of families (1,000s)	Percent affected under proposal	Affected families: Average benefit	Average earnings	Average income tax	Average Social Security tax[2]	Percent change: benefits	Percent change: earnings	Percent change: income tax	Percent change: Social Security tax[2]
TOTAL	9,681	9.3	$6,218	$40,356	$8,056	$4,762	76.1	1.1	7.8	1.5
Family composition										
Couples living alone	4,913	9.8	6,707	44,121	9,810	4,847	77.2	1.1	7.4	1.5
Couples living with others	1,203	12.8	5,831	55,921	9,418	6,811	92.8	0.5	6.7	1.3
Widow/widowers living alone	1,810	5.5	4,874	20,814	3,760	2,729	66.0	1.9	9.7	2.4
Widows/widowers with others	488	7.5	6,636	33,116	4,056	4,842	41.9	1.9	8.2	-1.5
Divorced/separated	819	9.4	5,700	25,853	4,232	3,665	70.8	2.3	12.9	2.7
Never married	448	10.8	5,895	22,331	4,281	3,287	64.6	2.1	12.3	2.5
Preplan family income deciles										
Lowest	977	0.2	4,507	24,798	240	3,794	112.2	-0.4	0.0	-0.4
Second	970	--	--	--	--	--	--	--	--	--
Third	971	0.8	1,391	10,968	545	1,423	164.0	1.0	47.0	0.0
Fourth	972	3.4	4,009	11,259	636	1,723	39.0	2.8	20.1	2.6
Fifth	963	5.0	5,579	12,650	920	1,935	22.9	3.3	7.7	3.2
Sixth	967	8.7	6,384	16,347	1,411	2,465	28.7	3.2	6.8	3.3
Seventh	972	10.2	7,435	19,542	1,981	2,910	37.6	2.5	8.3	0.7
Eighth	960	15.2	7,758	24,084	2,993	3,560	42.0	2.3	10.0	2.1
Ninth	961	20.7	7,189	33,925	5,539	4,726	68.3	1.5	12.2	1.9
Tenth	969	28.6	4,744	77,359	19,071	7,723	168.1	0.4	6.6	1.0
Sex of head										
Male	6,772	10.1	6,398	44,854	9,281	5,110	80.8	1.0	7.5	1.5
Female	2,909	7.2	5,625	25,541	4,019	3,619	58.4	1.9	9.9	1.4
Beneficiary status										
New beneficiaries	172	100.0	0	79,928	18,503	7,944	(*)	-0.3	6.5	-0.1
Beneficiaries with increases	705	100.0	7,716	31,282	5,679	4,038	49.7	1.9	8.8	2.2

[1] This table excludes families with neither head nor spouse aged 65-69, but which include at least one member aged 65-69 sometime during 1990. Affected families of this type represent less than 4 percent of all affected families.

[2] Includes employer share of the Social Security tax.

(*) Not applicable, zero value divisor.

Table A2.--Effects of modifying the earnings test on families with head or spouse aged 65-69, by demographic and financial characteristics, 1990[1]

Plan: Exempt amount = $20,000 Work-response assumption: Intermediate

	Number of families (1,000s)	Percent affected under proposal	Affected families							
			Average benefit	Average earnings	Average income tax	Average Social Security tax[2]	Percent change: benefits	Percent change: earnings	Percent change: income tax	Percent change: Social Security tax[2]
TOTAL	9,681	7.8	$7,234	$30,898	$5,403	$4,191	32.1	0.9	4.2	0.8
Family composition										
Couples living alone	4,913	7.8	8,222	31,974	6.365	4,119	28.3	1.0	4.0	1.2
Couples living with others	1,203	10.3	7,078	45,891	6,389	6,237	35.2	0.4	3.1	0.3
Widow/widowers living alone	1,810	5.3	5,060	17,990	3,048	2,752	42.1	1.8	6.2	1.9
Widows/widowers with others	488	7.5	6,636	33,116	4,056	4,842	26.2	1.0	3.5	-2.5
Divorced/separated	819	8.9	5,882	23,118	3,608	3,500	41.8	1.0	5.6	1.0
Never married	448	9.6	6,618	18,460	3,509	2,778	36.9	1.0	7.0	0.7
Preplan family income deciles										
Lowest	977	0.2	4,507	24,798	240	3,794	81.9	-0.3	0.0	-0.3
Second	970	--	--	--	--	--	--	--	--	--
Third	971	0.8	1,391	10,968	545	1,423	164.0	1.0	47.0	0.0
Fourth	972	3.4	4,009	11,259	636	1,723	39.0	2.8	20.1	2.6
Fifth	963	5.0	5,579	12,650	920	1,935	22.7	3.3	7.7	3.2
Sixth	967	8.7	6,384	16,347	1,411	2,465	27.4	2.5	5.1	2.5
Seventh	972	10.2	7,435	19,542	1,981	2,910	32.7	1.9	5.8	0.2
Eighth	960	14.8	7,965	23,757	2,948	3,506	29.5	1.7	6.0	1.4
Ninth	961	18.4	8,007	32,055	5,354	4,508	31.6	0.6	5.2	0.4
Tenth	969	16.7	7,521	60,801	14,359	7,429	36.6	0.3	3.0	0.4
Sex of head										
Male	6,772	8.2	7,763	33,480	6,044	4,457	30.5	0.9	3.9	1.0
Female	2,909	6.9	5,771	23,752	3,629	3,455	37.9	1.2	5.3	0.3
Beneficiary status										
New beneficiaries	64	100.0	0	51,386	8.398	7,429	(*)	-0.2	3.1	-0.2
Beneficiaries with increases	671	100.0	7,937	29,203	5,203	3,919	29.4	1.1	4.3	0.9

[1] This table excludes families with neither head nor spouse aged 65-69, but which include at least one member aged 65-69 sometime during 1990. Affected families of this type represent less than 4 percent of all affected families.

[2] Includes employer share of the Social Security tax.

(*) Not applicable, zero value divisor.

Table A3.--Effects of modifying the earnings test on families with head or spouse aged 65-69, by demographic and financial characteristics, 1990[1]
Plan: Exempt amount = $12,000 — Work-response assumption: Intermediate

	Number of families (1,000s)	Percent affected under proposal	Affected families: Average benefit	Average earnings	Average income tax	Average Social Security tax[2]	Percent change: benefits	Percent change: earnings	Percent change: income tax	Percent change: Social Security tax[2]
TOTAL	9,681	7.3	$7,503	$30,045	$5,214	$4,068	13.1	0.3	1.4	0.3
Family composition										
Couples living alone	4,913	7.2	8,650	31,294	6,194	3,987	11.1	0.3	1.4	0.4
Couples living with others	1,203	9.8	7,180	43,947	5,884	6,037	15.8	0.0	0.8	-0.1
Widow/widowers living alone	1,810	5.2	5,194	17,283	3,035	2,644	18.8	0.7	2.1	0.7
Widows/widowers with others	488	7.4	6,737	32,788	3,981	4,803	10.2	0.5	1.2	0.6
Divorced/separated	819	8.2	6,075	22,338	3,564	3,394	15.3	0.2	1.6	0.2
Never married	448	9.1	6,868	18,609	3,619	2,799	15.9	0.2	2.7	0.1
Preplan family income deciles										
Lowest	977	0.2	4,507	24,798	240	3,794	22.3	-0.1	0.0	-0.1
Second	970	--	--	--	--	--	--	--	--	--
Third	971	0.8	1,391	10,968	545	1,423	164.0	1.0	47.0	0.0
Fourth	972	3.1	4,158	10,946	578	1,675	39.7	2.5	21.9	2.3
Fifth	963	4.6	5,485	12,570	964	1,923	16.7	0.8	2.5	0.8
Sixth	967	8.2	6,478	16,235	1,409	2,446	12.3	0.7	1.2	0.8
Seventh	972	10.2	7,435	19,542	1,981	2,910	14.8	0.6	1.8	0.7
Eighth	960	13.7	8,309	23,340	2,911	3,432	11.4	0.4	1.7	0.1
Ninth	961	17.8	8,193	31,649	5,348	4,434	10.4	0.1	1.5	0.1
Tenth	969	14.9	8,245	59,470	14,045	7,200	12.0	0.1	0.9	0.1
Sex of head										
Male	6,772	7.6	8,119	32,611	5,825	4,327	12.4	0.2	1.3	0.2
Female	2,909	6.7	5,889	23,327	3,616	3,389	15.6	0.5	1.8	0.5
Beneficiary status										
New beneficiaries	41	100.0	0	45,503	5,689	6,792	(*)	-0.2	2.2	-0.2
Beneficiaries with increases	664	100.0	7,951	29,156	5,203	3,907	11.4	0.3	1.3	0.3

[1] This table excludes families with neither head nor spouse aged 65-69, but which include at least one member aged 65-69 sometime during 1990. Affected families of this type represent less than 4 percent of all affected families.

[2] Includes employer share of the Social Security tax.

(*) Not applicable, zero value divisor.

Table A4.--Effects of modifying the earnings test on families with head or spouse aged 65-69, by demographic and financial characteristics, 1990[1]

Plan: Lower exempt age to 67 — Work-response assumption: Intermediate

	Number of families (1,000s)	Percent affected under proposal	Affected families: Average benefit	Average earnings	Average income tax	Average Social Security tax [2]	Percent change: benefits	Percent change: earnings	Percent change: income tax	Percent change: Social Security tax [2]
TOTAL	9,681	4.3	$7,039	$38,185	$7,684	$4,732	57.0	1.0	7.2	1.1
Family composition										
Couples living alone	4,913	4.5	7,853	42,473	9,739	4,759	56.4	1.0	6.7	1.1
Couples living with others	1,203	4.5	6,184	59,914	9,406	8,196	77.6	0.4	5.9	0.2
Widow/widowers living alone	1,810	3.7	5,701	18,639	3,688	2,647	50.1	1.8	9.6	2.2
Widows/widowers with others	488	3.4	7,598	39,690	4,852	5,590	24.8	0.5	5.2	0.6
Divorced/separated	819	4.5	6,384	25,670	4,171	3,858	62.2	2.1	13.1	2.5
Never married	448	5.1	5,693	20,823	2,997	3,080	55.3	2.4	14.0	2.8
Preplan family income deciles										
Lowest	977	--	--	--	--	--	--	--	--	--
Second	970	--	--	--	--	--	--	--	--	--
Third	971	0.3	1,235	10,961	435	1,677	306.4	-0.7	67.2	-0.7
Fourth	972	2.2	4,035	11,530	709	1,764	47.3	2.0	19.2	1.9
Fifth	963	3.1	6,078	11,845	779	1,812	9.7	1.8	4.7	1.6
Sixth	967	3.5	7,176	15,899	1,310	2,343	20.6	2.4	5.8	2.7
Seventh	972	5.4	7,832	20,065	2,133	2,966	38.0	2.1	8.7	1.9
Eighth	960	6.9	8,824	22,591	2,953	3,376	28.2	1.6	8.0	1.2
Ninth	961	8.9	8,101	33,327	5,674	4,949	52.3	1.6	11.4	1.8
Tenth	969	13.1	5,887	74,333	18,469	7,913	117.7	0.5	6.1	0.5
Sex of head										
Male	6,772	4.6	7,452	42,930	9,042	5,117	58.0	1.0	6.8	1.0
Female	2,909	3.7	5,842	24,444	3,755	3,616	53.6	1.2	9.8	1.5
Beneficiary status										
New beneficiaries	50	100.0	0	82,786	18,786	8,373	(*)	-0.3	6.3	-0.2
Beneficiaries with increases	351	100.0	8,035	32,957	6,449	4,323	43.9	1.4	7.5	1.3

[1] This table excludes families with neither head nor spouse aged 65-69, but which include at least one member aged 65-69 sometime during 1990. Affected families of this type represent less than 4 percent of all affected families.

[2] Includes employer share of the Social Security tax.

(*) Not applicable, zero value divisor.

Table A5.--Effects of modifying the earnings test on families with head or spouse aged 65-69, by demographic and financial characteristics, 1990[1]

Plan: Lower exempt age to 69 — Work-response assumption: Intermediate

	Number of families (1,000s)	Percent affected under proposal	Affected families: Average benefit	Average earnings	Average income tax	Average Social Security tax[2]	Percent change: benefits	Percent change: earnings	Percent change: income tax	Percent change: Social Security tax[2]
TOTAL	9,681	1.7	$7,896	$35,791	$7,847	$4,190	41.6	1.5	6.7	1.4
Family composition										
Couples living alone	4,913	1.9	8,519	41,011	9,779	4,405	41.5	1.5	6.3	1.0
Couples living with others	1,203	1.4	8,715	36,776	4,041	5,345	38.8	1.0	5.0	1.1
Widow/widowers living alone	1,810	1.2	6,111	20,956	6,753	2,566	37.3	2.3	5.7	2.5
Widows/widowers with others	488	0.5	7,416	77,320	12,106	8,901	70.5	-0.2	5.3	-0.2
Divorced/separated	819	1.4	9,663	27,334	4,413	4,155	30.3	4.1	15.2	4.6
Never married	448	2.9	3,626	19,592	2,667	2,809	79.6	0.5	13.5	0.7
Preplan family income deciles										
Lowest	977	--	--	--	--	--	--	--	--	--
Second	970	--	--	--	--	--	--	--	--	--
Third	971	0.2	0	11,349	334	1,736	(*)	-1.0	133.3	-1.0
Fourth	972	0.7	5,031	11,695	803	1,789	1.1	4.4	9.6	4.4
Fifth	963	1.3	6,286	11,669	608	1,785	6.0	2.6	7.4	2.7
Sixth	967	0.8	5,438	17,900	1,599	2,739	22.7	2.8	7.8	2.8
Seventh	972	2.1	8,947	18,099	1,896	2,708	25.0	1.4	7.2	1.5
Eighth	960	2.5	10,011	20,184	2,890	3,088	18.5	2.0	7.0	2.0
Ninth	961	4.3	9,503	35,050	5,796	5,211	40.7	1.9	11.2	2.2
Tenth	969	4.7	6,476	66,628	19,295	5,863	84.7	1.2	5.3	0.3
Sex of head										
Male	6,772	2.0	8,064	36,816	8,246	4,152	42.0	1.4	6.4	1.1
Female	2,909	0.9	6,991	30,276	5,694	4,392	38.9	2.7	9.6	3.3
Beneficiary status										
New beneficiaries	9	100.0	0	73,487	22,021	7,610	(*)	-0.2	3.8	0.0
Beneficiaries with increases	133	100.0	8,573	35,668	7,763	4,153	41.6	1.5	7.2	1.2

[1] This table excludes families with neither head nor spouse aged 65-69, but which include at least one member aged 65-69 sometime during 1990. Affected families of this type represent less than 4 percent of all affected families.

[2] Includes employer share of the Social Security tax.

(*) Not applicable, zero value divisor.

Table A6.--Effects of modifying the earnings test: Effects by family income deciles, 1990

Plan: Full removal, 3.5% DRC; Work-response assumption: No response

	Change in benefits	Change in earnings	Change in income taxes	Change in Social Security taxes[1]	Net benefit
TOTAL (millions)	$4235	$0	$467	$0	$3769
Percent	100.00	(*)	100.00	(*)	100.00
Families grouped by preplan income deciles[2]					
Lowest	.23	(*)	.00	(*)	.25
Second	.00	(*)	.00	(*)	.00
Third	.41	(*)	.40	(*)	.41
Fourth	1.21	(*)	.59	(*)	1.29
Fifth	1.70	(*)	.04	(*)	1.91
Sixth	3.82	(*)	.27	(*)	4.26
Seventh	6.32	(*)	1.45	(*)	6.92
Eighth	11.10	(*)	5.61	(*)	11.78
Ninth	23.54	(*)	23.30	(*)	23.57
Tenth	51.67	(*)	68.34	(*)	49.61

[1] Includes employer share of the Social Security tax.

[2] The family income breakpoints which define the deciles were estimated for families with head or spouse aged 65-69. The breakpoints are: $7,079; 10,460; 14,074; 17,988; 22,087; 26,504; 33,027; 41,933; and 59,558.

(*) Not applicable, zero value divisor.

Table A7.--Effects of modifying the earnings test on families with head or spouse aged 65-69, by demographic and financial characteristics, 1990[1]

Plan: Full removal, 3.5% DRC — Work-response assumption: No response

	Number of families (1,000s)	Percent affected under proposal	Affected families: Average benefit	Average earnings	Average income tax	Average Social Security tax[2]	Percent change: benefits	Percent change: earnings	Percent change: income tax	Percent change: Social Security tax[2]
TOTAL	9,681	9.1	$6,274	$40,592	$8,017	$4,774	75.8	0.0	6.6	0.0
Family composition										
Couples living alone	4,913	9.5	6,762	44,540	9,863	4,875	77.3	0.0	6.3	0.0
Couples living with others	1,203	12.7	5,877	55,793	9,047	6,776	92.2	0.0	6.3	0.0
Widow/widowers living alone	1,810	5.4	4,901	20,817	3,883	2,721	65.6	0.0	7.2	0.0
Widows/widowers with others	488	7.5	6,749	32,777	3,781	4,790	39.5	0.0	5.3	0.0
Divorced/separated	819	9.1	5,664	25,867	4,300	3,660	71.4	0.0	9.0	0.0
Never married	448	10.3	6,168	22,390	4,020	3,291	63.3	0.0	10.4	0.0
Preplan family income deciles										
Lowest	977	0.2	4,477	24,888	240	3,808	113.7	0.0	0.0	0.0
Second	970	--	--	--	--	--	--	--	--	--
Third	971	0.8	1,416	10,894	532	1,419	159.4	0.0	44.8	0.0
Fourth	974	3.2	3,945	10,883	531	1,665	42.4	0.0	16.8	0.0
Fifth	966	4.6	5,631	12,720	1,040	1,946	25.6	0.0	0.4	0.0
Sixth	967	8.6	6,790	16,001	1,338	2,411	26.3	0.0	0.6	0.0
Seventh	968	9.8	7,284	19,838	2,045	2,953	38.8	0.0	3.5	0.0
Eighth	959	14.8	7,797	23,987	3,054	3,544	42.4	0.0	6.0	0.0
Ninth	962	20.8	7,284	34,043	5,654	4,755	66.4	0.0	9.3	0.0
Tenth	966	28.2	4,749	77,611	18,696	7,695	168.3	0.0	6.3	0.0
Sex of head										
Male	6,772	9.9	6,452	45,269	9,293	5,136	81.0	0.0	6.5	0.0
Female	2,909	7.1	5,695	25,426	3,878	3,599	56.8	0.0	7.1	0.0
Beneficiary status										
New beneficiaries	172	100.0	0	79,928	18,083	7,944	(*)	0.0	7.0	0.0
Beneficiaries with increases	705	100.0	7,807	30,981	5,557	3,999	48.0	0.0	6.3	0.0

[1] This table excludes families with neither head nor spouse aged 65-69, but which include at least one member aged 65-69 sometime during 1990. Affected families of this type represent less than 4 percent of all affected families.

[2] Includes employer share of the Social Security tax.

(*) Not applicable, zero value divisor.

REFERENCES

BURTLESS, GARY AND ROBERT A. MOFFITT: The Effect of Social Security Benefits on the Labor Supply of the Aged," in Retirement and Economic Behavior, eds. Henry J. Aaron and Gary Burtless, Washington, DC: Brookings Institution, 1984, 135-74.

_____. "The Joint Choice of Retirement Age and Postretirement Hours of Work," Journal of Labor Economics, 3 (2), April 1985, 209-36.

CONGRESSIONAL BUDGET OFFICE: "The Social Security Earnings Test and Options for Change," Staff Working Paper, September 1988.

HANOCH, GIORA AND MARJORIE HONIG: "Retirement, Wages, and Labor Supply of the Elderly," Journal of Labor Economics, 1 (2), April 1983, 131-51.

LEONESIO, MICHAEL V.: "The Effects of the Social Security Earnings Test and Related Provisions on the Labor Market Activity of Older Americans: A Review of the Evidence, With Suggestions for Further Research," unpublished manuscript, Office of Research and Statistics, Social Security Administration, November 28, 1988

PACKARD, MICHAEL: "The Effects of Removing 70- and 71-Year-Olds from Coverage Under the Social Security Earnings Test," unpublished manuscript, Office of Research and Statistics, Social Security Administration, August 16, 1988.

PELLECHIO, ANTHONY J.: "The Social Security Earnings Test, Labor Supply Distortions and Foregone Payroll Tax Revenue," NBER Working Paper 272, Cambridge, MA: NBER, August 1978.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES: Social Security Handbook, Ninth edition, Social Security Administration, SSA Publication No. 05-10135, 1986.

VROMAN, WAYNE: Older Worker Earnings and the 1965 Social Security Amendments. Social Security Administration, U.S. Department of Health, Education, and Welfare, Office of Research and Statistics Research Report No. 38, 1971.

_____. "Some Economic Effects of the Social Security Retirement Test," in Research in Labor Economics, Vol. 7, ed. Ronald G. Ehrenberg, Greenwich, CT: JAI Press, 1985, 31-89.

WIXON, BERNARD, BENJAMIN BRIDGES, JR., AND DAVID PATTISON: "Policy Analysis Through Microsimulation: The STATS Model," Social Security Bulletin, 50 (12), December 1987, 4-12.