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## ABSTRACT

This paper simulates the effects of proposals to modify procedures for adjusting the Social Security benefits of those who work after normal retirement age. A basic set of policies, currently under consideration, is projected to raise long run costs by $30 billion dollars net of taxes, while inducing an increase of 5 percent in the number of full-time male workers between the ages of 65 and 69. Alternative policies may create very different flows of funds. Outcomes, especially in the short run, will vary widely with the timing of the application decision for benefits.

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# I. Introduction

The Social Security rules contain a provision by which benefits of older workers are reduced if they work and earn more than a certain amount. The justification of this provision was originally that Social Security benefits were for workers who had retired, not for workers who were still working. The original rules specified that benefits were to be reduced dollar for dollar for earnings over the specified amount. Over the years, the anti-work incentives of this scheme have been recognized, and changes have been made to mitigate these effects.

In 1973, the reduction rate for individuals 65 and older was changed to a dollar reduction in benefits for every two dollars in earnings over the exempt amount. Also in that year, a provision was introduced to increase future benefits by 1% for every year that benefits were not received because of the earnings test. In 1981, this was increased to 3% for every year that benefits are not received, and in 1983 the earnings test was eliminated entirely for individuals 70 and older. In present value terms, these increases do not fully offset the loss of current benefits for individuals in the 65-69 age range, but they are a start. Future changes as mandated in current law will go even further. Beginning in 1990, the reduction rate will again change to a dollar reduction in benefits for every three dollars in earnings over the exempt amount. Finally, for cohorts reaching age 65 between 1990 and 2007, the percentage by which future benefits are increased is scheduled to rise gradually to 8% for every year benefits are foregone, a percentage which is commonly regarded as being approximately actuarially fair.

Nevertheless, the earnings test remains a sore point among the elderly population, and recently there have been several proposals to eliminate the earnings test outright. The most visible proposals at this time introduce,

either starting in 1990 or phased in over a short period, three changes in the current law. First, the earnings test itself would be eliminated, so that individuals could receive full benefits as soon as they register regardless of any wage earnings they might have. Secondly, the increase to 8% in the rate at which future benefits are increased would be accelerated so that it would take effect in the next few years. Finally, the usual practice of replacing the low year of earnings in the benefit formula with current earnings, if higher, would be disallowed for years in which the individual collects benefits. The rationale for this last change is presumably to avoid giving working individuals a double bonus by allowing them to collect benefits or to recompute future benefits, but not both. All of these changes would apply only to individuals between the ages of 65 and 69.[1]

In this paper, we use a previously estimated life cycle model to analyze the effects of these policies and of other policies which would reduce the work disincentives of older workers. Among 65 to 69 year old males, simulations based on the Survey of Consumer Finances (SCF) suggest that the policy described above would, over the next two decades, raise full-time work by about 5%, which is approximately 40,000 workers per year. Over the two decades, the policy would increase benefit payments to this group and their spouses by 1.6%, at a net cost of over $30 billion. Other potential program changes with smaller labor supply effects are less expensive in the long run, but some, in particular those that simply eliminate the earnings test, would sharply increase benefit expenditures in the decade of the nineties. It is important to recognize that the results for many of the specific policies are sensitive to specification assumptions, especially regarding the degree to which individuals are

willing to postpone applying for benefits in order to gain actuarial returns.

The outline of the paper is as follows: Section II describes several critical features the Social Security program and the work incentives that these features collectively provide. The following section provides basic information about the simulation model used in the analysis. Section IV discusses several potential changes to the current laws, describes the incentives these changes would provide, and presents the results of simulations of these policy changes. This section also analyzes several specification changes. The final section summarizes the major findings.

## II. Retirement Incentives and Social Security.

### Provisions of the Current Social Security Laws.

In order to understand the incentives Social Security provides to work beyond the normal retirement age, it is helpful to be familiar with the way Social Security benefits are calculated. The basic Social Security benefit, available to workers who first collect benefits at the normal retirement age, is called the Primary Insurance Amount (PIA). For workers in the cohorts affected by the policies under consideration, the PIA is calculated on the basis of the Average Indexed Monthly Earnings (AIME). In the AIME calculations, earnings prior to age 60 are indexed to that age using national average earnings, and creditable earnings in each year are subject to a maximum. The highest 35 years of earnings are used for workers born in 1930 and later, with fewer years used for members of earlier cohorts. The formula used to determine PIA from AIME depends on the year the individual attains age 62. For workers reaching 62 in 1989, the PIA is 90% of AIME up to $339, 32% of AIME between $339 and $2044, and 15% of AIME above $2044.[2] The dollar amounts, which are called "bend

points," are indexed to national average earnings for workers who reach age 62 in other years.

If a worker earns more than a certain amount from wages, his Social Security benefits are reduced because of the Retirement Earnings Test (RET). Social Security benefits are currently reduced by $1 for each $2 of "excess" earnings over the Annual Exempt Amount (AEA), with the rate scheduled in 1990 to go to $1 for each $3 in excess earnings for workers aged 65-69. The AEA is currently $8880 for workers in this age range, and it is indexed to national average earnings.[3]

The Delayed Retirement Credit (DRC) partially makes up the benefit value that a worker may lose because of the RET. For workers in cohorts born in 1924 and earlier, the DRC increases subsequent benefits by 3% of the PIA for each year's worth of benefits lost because of the RET after age 65. For workers in cohorts born in 1925 and later, the DRC is scheduled to increase by one-half percentage point with every other cohort until it reaches 8% for workers in cohorts born in 1943 and later. The DRC also applies if benefits are not received because the worker has not yet applied for benefits.

If a worker is married and is currently receiving benefits, a spouse who is at least 62 years old may receive benefits equal to half of the worker's PIA, reduced by 8.33% for every year that benefits are received before age 65. For a worker who subsequently loses benefits due to the RET, the lost benefits are prorated between worker benefits and spouse benefits in proportion to the amounts of the two benefits. If the spouse is below 65, lost benefits will cause future benefits to be increased (because benefits will have been received for fewer months prior to age 65), but if the spouse is 65 or older there is no provision to increase future benefits when current benefits are lost. Once the worker dies, the

spouse is entitled to survivor benefits which are in most cases equal to the benefits that he would have received were he still alive, including any increases resulting from the DRC. For both spouse and survivor benefits, a spouse who has worked herself instead will receive benefits based on her own earnings history if they are greater. The most important consequence of this is that if the PIA of the spouse is greater than about half of the PIA of the husband, spouse benefits will be irrelevant for calculating work incentives for the husband.

Incentives Under the Current Social Security Laws.

For a worker who retires at age $R$ in the 65-69 age range and immediately registers for benefits, the present value of the stream of Social Security benefits, discounted to age $A$, may be written as:

$$B = P(R)\ [1+c(R-65)] \int_R^T s(t|A)\ e^{-r(t-A)}\ dt$$

where $P$ is the primary insurance amount, $c$ is the delayed retirement credit rate, $T$ is the maximum lifetime, $s(t|A)$ is the probability that the individual will survive to age $t$ given that he has already survived to age $A$, and $r$ is the real discount rate. The real discount rate is appropriate in this context because Social Security benefits, once started, are indexed to the price level. Throughout the analysis, all calculations will assume an inflation rate of 4%, a rate consistent with long-run scenario II-B in the 1988 Trustee's Report, and an interest rate of 5.7%.

The incentives the Social Security rules provide to work and postpone collecting benefits may be obtained by differentiating the expression above with respect to the retirement age $R$ and evaluating the expression at $A = R$:

$$dB/dR = (dP/dR)\ [1+c(R-65)]\ V(R) + P(R)\ \{c\ V(R) - [1+c(R-65)]\}$$

where

$$V(R) = \int_{R}^{T} s(t|A)\ e^{-r(t-A)}\ dt.$$

The first term of $dB/dR$ is the increase in future benefits which may occur if the additional work causes an earlier year to be displaced in the AIME calculations, and the second term in the expression is the increase in the value of future benefits due to the DRC, less the current benefits foregone. These effects are illustrated in Figure 1. More specifically, the illustration pertains to a nonblack male who will reach age 62 in 1992 and who has a spouse two years younger. Further, this hypothetical individual has 1989 earnings of $25,000, and the earnings are growing at the rate of national earnings growth, plus 1% to reflect individual productivity growth.

The solid lines in the figure picture the effect of benefit recomputation on the present value of Social Security benefits for this individual. If the individual works through age 64, he will have an AIME of $2003 and be eligible for benefits of $10,476 per year. His spouse would be eligible for an additional $4365 in spouse benefits. Work during the 65th year would allow him to replace indexed earnings from 1960, which were $19,773, with 1995 earnings of $37,021, which will enter the AIME without indexing since it comes from a year past age 60. This would increase AIME by about $41 and raise the annual PIA by about $158.

Considering worker, spouse and survivor benefits, each $1 of PIA is associated with benefits which have a present value of about $22.96. Hence, the value of benefit recomputation is about $3622, or 24.4% of the benefits which the worker and his spouse could otherwise collect at age 65. This value is plotted as point A in the figure. Because earnings for ages

60 and over are entered into the AIME formula without indexing, the effect of recomputation is even greater at later ages. At other income levels, recomputation increases present value by 20.8% of the benefit at age 65 for an otherwise similar worker with an income of $15,000 in 1989 and 14.8% for an individual with an income of $35,000 in 1989.

Consider now the "actuarial" gains or losses to postponing registration, as reflected in the second term in the equation for dB/dR. The dashed lines in Figure 1 illustrate the combined effects of benefit deferral and the delayed retirement credit. DE pictures the situation with a 3% DRC and FGH the situation with an 8% DRC. To illustrate the calculation for a 3% DRC, suppose our hypothetical individual delays registering for benefits during his 65th year. He thereby forgoes his own and his spouse's benefits, which have a combined value of $14,841. As a result of the DRC, his own future benefits and any survivor benefits his spouse may collect are increased by 3% of the PIA, or $314. The present value of this stream is $5489. Additionally, spouse benefits will be increased by 4.1% of the PIA, which is associated with a present value equal of $4222. The total value of future benefit increases is thus $9711. Since $14,841 in current benefits is given up, this represents a net loss of $5133, which is plotted as point D in Figure 1. The other points along DE and FGH are calculated similarly. Along both curves, note particularly the sharp drop when the spouse reaches age 65, after which her benefits are no longer increased if registration is postponed.

The loss of $5133 represents 34.5% of the benefits which are forgone if the individual delays registration. Since both the numerator and denominator of the percentage are proportional to the PIA, the percentage itself does not depend on the PIA. Corresponding percentages at other ages

and other circumstances are calculated in Table 1. The top part of the table calculates returns for a 3% DRC and the bottom part for an 8% DRC. Within each part, the first line gives returns for a single individual. The middle lines pertain to a worker whose wife receives spouse benefits and will receive survivor benefits when the worker dies, and the last group list returns for a worker whose spouse will receive survivor benefits but not spouse benefits. This last case is appropriate when the wife has a sufficient earnings history that she is better off taking benefits on the basis of her own earnings history rather than collecting spouse benefits.

In all cases, the returns to delaying registering for benefits decline over time. A major part of the reason is that while the DRC is a fixed percentage of the PIA, the benefits given up are an increasing multiple of the PIA over time due to the effects of the DRC in previous years. For single workers, the decline in returns is steady over the age range. The same is true for a worker whose wife will collect survivor benefits but not spouse benefits, although in this case the returns are considerably higher than for single workers because any DRC increases will apply to survivor benefits as well. For an individual whose wife collects spouse benefits, there is always a sharp drop in returns when the spouse reaches 65, reflecting the fact that spouse benefits are not increased at all after age 65.

Data from the SCF suggest that among married men, only about 21% are the same age or younger than their spouses. At the median, the men are 3 years older than their spouses. Also, in about two fifths of the couples, the wife has a sufficient earnings history that it will pay her to collect benefits on the basis of that earnings history rather than to collect spouse benefits. Given these distributions, better than fair actuarial adjustments would be common at a DRC of 8%, at least in the first few years

after normal retirement age. However, an 8% DRC which is actuarially quite favorable to some individuals in some circumstances is still very unfavorable to other individuals in other circumstances. Indeed, it is clear that no single DRC rate can accomplish the goal of being neutral towards everyone in its effects on work incentives.[4]

The above figures are for a worker who decides to work another year and simultaneously to delay registering for benefits. The two decisions need not be so tightly linked, however. On the one hand, it is possible for an individual to delay registering for benefits even though he retires. The positive numbers in Table 1 indicate that for many individuals, the value of future benefits received outweigh the value of the current benefits which would be foregone by delaying registration, regardless of whether or not the individual continues working. On the other hand, as long as total earnings are below the breakeven amount, an individual may elect to collect some benefits even though he is working. For any individual for whom the value of the increased future benefits is less than benefits foregone, it will be advantageous to claim benefits as soon as possible.

For an individual who is working part time and who has begun receiving benefits, the combination of the RET and the DRC may affect the net wage rate on which the hours of work decision is based. For instance, suppose that an individual is in a situation where each dollar in benefits foregone results in only 65.5 cents worth of future benefit increases. If the applicable reduction rate is $1 in benefits for every $3 in earnings, then each $3 in earnings between the AEA and the breakeven level will cause a net loss of 34.5 cents in benefits. In this case, the effective marginal wage is reduced by 11.5% by the combined effect of the RET and the DRC.

## III. The Simulation Model.

The effects of these incentives are quantified in a simulation model. The simulation model blends empirical estimates from different sources. The population base is taken from the SCF, a representative national survey of households. Self reported information on earnings and work history is used as a basis for projecting earnings opportunities as each individual approaches retirement. Demographic measures and health status, as reported by the survey participants, are used as a basis for projecting health status around the time of retirement. The underlying preferences between leisure and earnings are taken from an earlier study of ours which was based on data for a sample of males from the Retirement History Study (RHS).

The opportunity set facing older workers involves complicated nonlinear and discontinuous tradeoffs between income and hours of leisure, and these tradeoffs vary as the individual ages. At each age, the individual chooses whether to work full-time, part-time, or to retire, how many hours to work if the part-time option is chosen, and how much to consume and to save. The opportunity set reflects the wage rates for full-time work and part-time work, the pension (if there is one), Social Security, and the effects of income taxes including the income tax on Social Security, payroll taxes, and the new Catastrophic Health taxes. A path of work effort and consumption yielding a global optimum must be found; it is not sufficient merely to search for a local optimum because of peaks and spikes in the opportunity set such as those associated with the large increase in the value of many pensions the year one qualifies for early retirement benefits.

The utility function used in the simulation is given by:

$$U = (1/\delta) \int_0^T ([C(t)]^{\delta} + e^{X_t\beta+\epsilon} [L(t)]^{\delta}) \, dt$$

where $C(t)$ and $L(t)$ are consumption and leisure at time $t$, and $T$ is the relevant time horizon. $X_t$ is a vector of variables (age, health status and a constant) which affect the relative weight of leisure in the utility function at time $t$ and $\beta$ is the associated vector of parameters, which is presumed to be constant across both time and individuals. $\delta$ (with $\delta <= 1$) and $\epsilon$ are time-invariant stochastic terms reflecting, respectively, the elasticity of substitution between consumption and leisure for each individual and the relative weight that the individual places on leisure. Values for $\beta$ and for the parameters of the distributions of the stochastic terms are previous estimates from Gustman and Steinmeier (1986 a and b). These estimates are based on the RHS, which is a survey of cohorts born between 1906 and 1911, observed as they phased into retirement over the decade 1969-79. The constant term in the estimated $\beta$ vector is adjusted by a small amount so that the simulated retirement patterns more closely match the pattern observed in the Survey of Consumer Finances for more recent cohorts. This allows for relatively small recent changes in retirement behavior that are unexplained by changes in opportunities[5].

An opportunity set is constructed for each male of the appropriate age in the 1983 Survey of Consumer Finances for whom sufficient information is available. Individuals are dropped from the sample if (i) there are no observed full-time wages, (ii) the last identifiable full-time job was with the government, (iii) the only full-time wages were in self-employment, or (iv) the individual was disabled and receiving Social Security Disability Insurance (SSDI) by age 55. Since the phased increase to an 8% DRC was intended to make it actuarially fair to everyone, we include cohorts up to

the cohort of 1942, which will be the last cohort to experience a DRC of less than 8%. The earliest cohort included is the cohort of 1921, whose members will be 69 in 1990, the year currently under consideration as the date that potential changes in the rules would be made effective. Females are excluded because comparable estimates of household utility functions are unavailable.

The first step in constructing the opportunity set is to project potential full-time earnings over each individual's working years. In the SCF, individuals were asked about wages in the current job and up to four retrospective jobs. Many SCF individuals were re-interviewed in 1986 and were also asked about wages in the current job at that time. To impute the potential full-time earnings profile, the latest full-time wage is identified. This wage is projected forward using the experience coefficients from a standard wage equation. It is also projected backward until the next most recent full-time wage is encountered. At that point, the imputed wage is taken as the observed wage at that time, and the profile is projected backward from that point until the third most recent full-time wage is encountered. The process continues until projections have been made backward to age 25. In this procedure, the experience coefficients come from the 1983 SCF cross-section data in which log wage is regressed on experience, experience squared, education, education squared, an experience-education interaction, and dummy variables for marital status, health status, geographical regions (4), and SMSA residence. Future general wage growth is assumed to be 5.7% per year, which is roughly consistent the intermediate (II-B) assumptions for the year 2000 used in the 1988 Report from the Board of Trustees of the Social Security System.

A separate projection is made of the potential wage in part-time jobs.

Previous work suggests that an individual who wishes to reduce work effort from full-time to part-time usually faces a wage offer for part-time work that is considerably lower than the wage on a full-time job (Gustman and Steinmeier, 1985). Observed part-time wages are used when available, and potential part-time wages for the remaining individuals are imputations which consider a set of explanatory variables and which also allow for the same correlation between full-time and part-time wages that is found for individuals for whom both types of wages are observed.

Social Security benefits are calculated on the basis of the rules that will be applicable to each cohort, as specified by the Social Security amendments passed in 1983. In addition to the phased changes in the DRC discussed earlier, these amendments include a phased increase in the normal retirement age to 66 for cohorts born between 1938 and 1943 and to 67 for cohorts born between 1955 and 1960. They also specify accompanying changes in the early retirement reductions to allow for the additional time between the early and normal retirement ages. The calculations include retired worker benefits, spouse benefits, and survivor benefits, and they allow for the possibility that the wife may have sufficient covered earnings to make it advantageous for her to collect benefits on the basis of her own earnings history. They also reflect the maximum on covered earnings, the differences among cohorts in the number of years used in calculating AIME, cost of living adjustments, and the paths of the AEA and the AIME bend points, but they neglect the maximum on family benefits.

A question arises as to whether individuals will in fact postpone applying for benefits if it is advantageous to do so. This question does not apply with a 3% DRC, since at that rate all individuals above age 65 should apply for benefits as soon as possible. When the DRC reaches the 8% neighborhood, however, it may in many cases be advantageous to delay

registering for Social Security benefits even if the worker has retired. Several assumptions are possible and will be explored later in the paper. At one extreme, it may be assumed that all individuals wait until the optimal moment to register. At the other extreme, it may be assumed that all individuals claim benefits as soon as possible, perhaps because of liquidity constraints, a mistrust of government promises for future payments, or poor knowledge about the working of the DRC. A middle ground, which will be employed for the main body of simulations, is to assume that individuals delay registration until optimal as long as they are working full-time, but claim benefits as soon as possible when they partially or fully retire. Such behavior would be especially plausible if liquidity problems affect retirees more than full-time workers.

For each individual in the 1983 SCF who indicated that they were covered by a pension, an attempt was made to collect and to include in the data set a detailed pension description from the pension provider. These pension provider records indicate the specific formulae used in calculating normal retirement, early retirement, and deferred vested benefits, the manner in which such variables as service years, average salary amounts, and social security offsets are calculated, and detailed descriptions of the requirements that the individual must have met in order to be eligible for the various classes of benefits. This information allows a relatively good calculation of the relevant pension accrual profiles, and for plans that specify required contributions, the amount of these contributions is subtracted from wages. The calculations also assume that whatever the pension documents indicated in 1983, service credits will be granted for work past normal retirement, as is now required under current law. In cases where the pension provider information is missing or defective, and

in jobs other than the current job in 1983, pensions are imputed from observed pensions in the same industry, occupation, and union status, if possible. The model omits any feedback from the proposed Social Security policy changes to pension values, since the literature on pensions is a long way from providing a definitive behavioral analysis of how pension characteristics are determined.

The taxes included in the model include the standard income tax, the tax on half of Social Security benefits over a specified amount, taxes specified in the new Medicare Catastrophic Coverage Act and the payroll tax. Income taxes are applied to income from wages and pensions and use standard rules for exemptions and the standard deduction. For the catastrophic coverage surcharge, whose rates and limits have been decided only for the period from 1989 to 1993, the model assumes that after 1994 the rate will remain at 28% and that the ceiling will be $1200 in 1994 and indexed thereafter. For part-time workers, the tax calculations use only the first (15%) tax bracket and the catastrophic coverage tax provisions, which are adequate for the lower incomes of part-time workers.

Using simple estimated probit equations with age as the explanatory variable, the model stochastically simulates future changes in health status, future eligibility for SSDI benefits if health deteriorates, and future transitions from nonpension to pension jobs.[6] As for the reverse transition, based on the very small turnover rates for pension-covered workers which we found in Gustman and Steinmeier (1987), and noting that the cohorts to be considered in the simulations will be at least 48 years old by 1990, the model assumes that those covered by pensions in the cohorts mentioned will remain covered until retirement. Further, reflecting the fact that mandatory retirement has been outlawed, individuals are presumed not to be forced out of pension jobs.

## IV. Simulation Results: Projecting Retirement Responses, Incomes, Benefits, and Taxes Paid.

Simulation is accomplished by applying monte carlo techniques. For each observation, ten random draws are taken for the stochastic terms $\delta$ and $\epsilon$ in the utility function and for the stochastic terms governing health, SSDI eligibility, and success in finding a pension job. Having obtained values for the stochastic elements in the model, the simulation first calculates optimal labor supply and consumption paths on the assumption that the current policy, as specified in the 1983 Amendments, will remain in place.[7] A second simulation calculates optimal labor supply from 1990 on, using whatever policy is assumed to be put in place at that time. This second simulation uses pre-1990 labor supply and consumption values from the first simulation, which in effect assumes that the policy introduced in 1990 is unexpected and that when it is introduced, the individual reoptimizes over the remainder of his lifetime. The effect of the policy is measured as the difference between the reoptimized values and the values in the original optimization. For anyone who has already partially or fully retired at the time of the change in the law, it is assumed that it will not be possible to return to full-time work in the main job.

The Mixed Policy Change.

The proposal under most intense discussion is a combination of three changes: (i) elimination of the RET in 1990 for those 65 and older, (ii) an increase in the DRC to 8% in 1990, and (iii) a restriction to limit benefit recomputation to only those years when no benefits are received. Related proposals would phase in these changes over a period of a few years. The incentives provided by such a combination reflect the effects of both the

DRC and recomputation. As shown in Table 1, and illustrated by FGH in Figure 1, an 8% DRC by itself usually generates a few years after 65 when the returns to postponing benefits are positive, followed by years in which the returns are negative. It clearly pays full-time workers to delay registration during the period when returns are positive, that is, up to G in Figure 1, especially since recomputation is also dependent on not receiving benefits. However, even after the returns become negative, it may still be advantageous to postpone registration until the returns become so negative as to outweigh the effect of recomputation, where the sum of AC plus FGH becomes negative. As compared to the present law, this mixed policy change clearly increases work incentives to members of the earlier cohorts under consideration, for whom, as in DE in Figure 1, a DRC near 3% represents sharply negative returns. For later cohorts the effects are much more muted, since those cohorts would receive DRC's near 8% anyway. In those cohorts, the only workers with increased work incentives are older workers for whom the negative returns from the DRC are so high that it pays them to begin collecting benefits even though such a decision causes them to forego recomputation.

Table 2 details the effects of the mixed policy change on work effort by year and age.[8] Over the first ten years of the program, the effect of the program is to raise full-time labor force participation by a median value of about one percentage point. This is over a median full-time participation rate of about 28 percent. Among the key age groups, the table indicates that over approximately two decades, the probability of full-time work will increase by 1.8 percentage points for 65 year olds, 1.6 percentage points for 66 year olds, and 1.3 percentage points for 67 year olds. These represent proportionate increases of 5.6%, 5.9% and 5.5% over

the respective base levels of 32.7%, 27.4% and 22.6%, and larger proportionate increases over the first fifteen years following adoption of the program. As can be seen, the increases in the fraction working full-time come primarily from those who otherwise would have been fully retired rather than from those who otherwise would have worked part-time.

Next consider estimates of the effects of the reforms over the lifetimes of the various cohorts affected. Table 3 reports estimates of the likely effects of the policy on earnings, discounted lifetime Social Security benefit payments, and tax receipts for each cohort. All dollar amounts are in 1989 dollars. Column 3 indicates the proportionate change in the present value of Social Security benefits for each cohort. The median benefit increase is 1.5%, and the average change is 1.6%. Dividing the weighted sum of the figures in column 1 by the sum in column 2, the increase in earnings induced by the policy is 59% of the addition to benefit payments ($21.9 billion / $37.4 billion). Adding the (weighted) dollar figures in the tax column and dividing by the corresponding figure in the Social Security benefit column, induced increases in taxes are predicted to cover 17% of the increase in benefits associated with the proposed reforms ($6.5 billion / $37.4 billion).

Year by year changes in Social Security benefit receipts and tax payments are reported in Table 4.[9] Notice that through most of the decade of the nineties, the basic policy creates a small saving in social security benefit payments. As discussed above, many full-time workers have an incentive to postpone applying for benefits either to take advantage of positive returns from the DRC or to avoid losing recomputation. It is the deferral of applications that creates this savings. During the first decade, the median fall in benefit payments is about 2%, while the median increase in taxes for this group is also about 2%. In later years, when

the number of individuals collecting higher benefits based on the more favorable DRC increases, these savings turn into costs. The anomalies in the first two years arise from the fact that some individuals who would find it optimal to postpone registering for benefits had they anticipated the change will have already registered by 1990 and hence be unable to forestall receiving full benefits when the RET is eliminated.

The distributional implications of the policy are reported in Table 5. The measure of earnings in the table is an index of annual earnings over the lifetime, calculated by dividing 41 into total potential discounted earnings from age 21 through age 61. In contrast to a measure like current earnings, which has been used by the CBO and others to measure the distributional effects of such policies, this measure of earnings is a "full earnings" measure, calculated on the assumption of work until age 61, and is thus independent of the retirement decision. The middle column reports the percent change in the present value of social security benefits from adopting the policy. The median figure is 1.0 percent for the lowest quarter of the distribution and 2.1 percent for the top quarter of earners, indicating that the percentage increase in benefits for the top quarter is twice as large as the percentage increase for the bottom quarter. The last column indicates that for each quartile, taxes cover between 10 and 20 percent of the additional cost. This implies that the distribution of benefit increases net of taxes is similar to the distribution of the gross benefit increases.

The first column of Table 6 summarizes the main results for the mixed policy change. 65 to 69 year olds who are affected by the policy change increase full-time work over the two decades by about 5 percent. Multiplying by the population in 1990 of nongovernmental, not self-employed

full-time men who were not disabled before age 50, this amounts to around 40,000 per year.[10] The present value of benefits eventually received by these cohorts increases by about 1.6 percent, or roughly $37 billion, while the total lifetime taxes paid by these cohorts increases by substantially less, $6 billion. Cash flow in the short run will be positive, however, with benefit payments falling in the first decade by about $4 billion and taxes paid rising by an equal amount. The lifetime benefit and tax changes are obtained by multiplying the per individual figure for each cohort by the number of individuals in the cohort and summing, while the short run figures come from multiplying the amounts per individual per year in Table 4 by the number of individuals 62 or older alive that year and summing.

Most of the additional benefit payments under the mixed program are not associated with increased labor supply. In a simulation where the mixed policy change is introduced and full-time workers adjust the timing of the benefit receipt, but where the induced labor supply increase is surpressed, benefit payments increase in the long run by $34 billion rather than $37 billion. Suppressing the labor supply response and the associated increase in earnings, however, eliminates any net change in tax receipts compared to current policy.

Alternative Policy Changes.

The next three columns present analogous results for three alternative policies also under current consideration, the first two of which phase in the mixed policy change. The first would phase in the changes by cohort, eliminating the RET and raising the DRC between 1990 and 1995, beginning with the oldest cohorts, and eliminating benefit recomputation for years individuals receive benefits as a result. The second would raise the AEA gradually from 1990 to 1995, eliminating the RET completely in 1995, and would raise the DRC and introduce the restricted recomputation in 1990.

The third would raise the AEA gradually from 1990 to 1995 but would leave the RET, the schedule for DRC increases, and the eligibility for recomputation unaltered from current law. As compared to the immediate implementation of the mixed policy change, both phase-in policies would reduce most of the effects by around 25-30%. The last of these policies, which calls for a simple rise in the AEA, would cause a much smaller rise in both full-time work and long run benefit payments, the latter of which would be only $10 billion as compared to $40 billion with the immediate mixed policy change. However, in contrast to the other policies, this policy would result in a substantial increase in benefit payments in the first decade rather than a decline, largely because it does not contain the inducements to delay registration for benefits that the other policies do.

The remaining columns of Table 6 present results for four other policy changes that might reasonably be considered. The first two would each change only one aspect of present law, with the first eliminating the RET but leaving the scheduled increases in the DRC in place and the second raising the DRC to 8% immediately but leaving the RET unchanged. The third both eliminates the RET and raises the DRC immediately, which is essentially the mixed policy change less the restricted recomputation. The fourth eliminates both the RET and the DRC, reflecting the fact that the only reason that the DRC came into existence in the first place was to compensate individuals partially when benefits were lost to the RET.

The two policies involving a rise in the DRC, and indeed all policies in the table which raise the DRC faster than currently scheduled, increase both full-time work and the long run benefit costs of the system dramatically. Because tax receipts are less affected, these policies involve large long run net costs to the system. The other two policies,

both of which eliminate the RET without restricting recomputation, involve much lower long run expenditures but higher expenditures in the first decade. But the favorable short term cash flow from policies which use a highly favorable DRC to induce beneficiaries to delay registering for benefits essentially represents borrowing from future beneficiaries. The bill will come in the form of higher future payments at a time when the demographics will also turn highly unfavorable.

There is one characteristic of the final policy which merits an additional note. This is the only policy which does not specify an 8% DRC for cohorts born after 1942. Since all policies which increase the DRC rapidly have a high long run benefit cost due to the favorable return which an 8% DRC rate represents, it is plausible that eliminating an 8% DRC for the cohorts beyond 1942, which are not represented in the table, could result in substantial long run benefit savings to the system. These benefit savings would make the long run net cost figures for this policy even more favorable than the table indicates.

Sensitivity to Specification Choices.

In the simulations conducted to this point, it is presumed that full-time workers will postpone applying for benefits until the optimal time. However, all retired and part-time workers are assumed to claim benefits as soon as possible. Thus, at the latest, benefits are applied for as soon as one leaves full-time work on the main job. This section analyzes the sensitivity of the results to the assumption made about the application decision. One alternative assumption is that all individuals defer applying as long as it is financially advantageous to do so. The second alternative is that all individuals, including full-time workers earning less than the breakeven amount, claim benefits as early as possible. The sensitivity is analyzed for the immediate mixed policy change: abolishing

the RET, increasing the DRC to 8 percent, and changing the eligibility for benefit recomputation, all in 1990.

Table 7 reports the results of these simulations. The first column reiterates the previous results for the mixed policy change, which assume that full-time workers delay registering for benefits until the optimal time, but part-time workers and retirees claim benefits as soon as possible. The second column presents results for the same policy under the assumption that the retired and partially retired also wait until the optimal time to register for benefits, i.e., until G in Figure 1. This scenario affects incentives facing workers who retire before the actuarial returns turn negative. In the original scenario, those returns are part of the compensation to working another year, but in this scenario such returns can be realized anyway and are not part of the reward for continued work. As a result, the mixed policy change increases full-time work by only half as much in this scenario as in the original scenario. The long run costs are dramatically higher, however, as are the short run savings. This arises because many of the workers retiring before 65, particularly in the earlier cohorts who are currently scheduled for lower DRC rates, will find it advantageous to delay registration to take advantage of the newly available positive actuarial returns. This delay in registration reduces short run benefit costs but increases long run costs.

The third column of the table assumes that all workers claim benefits as soon as possible. In this scenario, because the mixed policy restricts benefit recomputation to those who have not yet claimed benefits, adoption of the policy eliminates work incentives from recomputation. For the older cohorts, the loss of recomputation may be largely offset by the avoidance of a DRC which is substantially less than fair. For the younger cohorts,

the DRC will be at or near 8% in any case. As a result, the mixed policy change will have a more negative effect on work incentives. In response to the policy change, the number of full-time workers would decline by 29,000 per year in this scenario, long run benefit costs would be reduced by $12 billion, and short run benefit costs would increase by $32 billion. All three of these are large in magnitude and are in the opposite direction of those that would occur in the original scenario.

In the main results of the paper, we have taken an intermediate position regarding the willingness of workers to postpone registration for benefits if it is financially advantageous to do so. For part-time and retired workers, we acknowledge that liquidity and other considerations may lead these workers to claim benefits regardless of actuarial considerations. However, many of these considerations do not apply as strongly to full-time workers, and the mixed policy change, by restricting recomputation to those not collecting Social Security benefits, would provide substantial incentives for full-time workers to postpone benefits. Such incentives have not previously been seen in the Social Security system on an extended basis, but similar incentives have been present in many pension plans for years. With regard to pensions, evidence does suggest that where substantial incentives are concerned, workers do alter their retirement behavior. This is most evident with workers who strongly avoid retiring just before they are eligible for early retirement benefits, at which time the value of the pension jumps substantially (Stock and Wise, 1988). For this reason, we prefer, especially in the longer run, predictions based on the assumption that full-time workers respond if faced with the strong incentives which the mixed policy change would entail, but in any case the sensitivity of the results for full-time work effort and for short and long run benefit costs to this assumption should be noted.

Not all the policy changes considered have results that are as sensitive to this assumption. Policies which do not raise the DRC to 8% over a short period of time will involve more individuals for whom the DRC is inadequate and who will begin collecting benefits simply because it is not advantageous to wait. These policies include those which gradually raise the AEA (policy 4 in Table 6) or which eliminate the RET without raising the DRC faster than currently specified (policies 5 and 8 in Table 6). In particular, the last policy in Table 6, which eliminates both the RET and the DRC in 1990, generates results which are not sensitive at all to the assumption made. This policy has the effect of forcing everyone to begin collecting benefits at the normal retirement age, making irrelevant the question of whether or not individuals would delay registration if it were advantageous to do so.

One final question of sensitivity arises over the issue of survivor benefits. The individual is not going to be alive when these benefits are collected. If the individual ignores the welfare of the spouse after he dies, these benefits will be irrelevant for his labor supply decision, although they will still enter as benefit costs for the Social Security system. Since a nontrivial part of the value of the DRC is represented by survivor benefits, an increase in the DRC to 8% does not increase work incentives as much in this scenario as before. The last column of Table 7 indicates the effects of the mixed policy change, assuming the workers do not place any value on survivor benefits in their labor supply decisions. As expected, the major change is that in this scenario, the mixed policy change produces a far lower increase in full-time workers. The increase in benefit costs is modestly lower in the long run, but in this case benefit costs increase even in the short run. This latter effect arises because,

with the exclusion of survivor benefits, it will more often be optimal to begin collecting benefits when the RET is removed.[11]

## V. Summary and Conclusions.

Currently the combined effects of the RET and the DRC penalize most individuals who work after the normal retirement age. The Social Security Amendments already passed provide for a gradual increase in the DRC rate until, for the cohort reaching 62 in 2004, it reaches a level perceived as being actuarially neutral. However, there is considerable sentiment to eradicate the negative work incentives of the DRC more rapidly. One proposal in this direction would raise the DRC to 8% and eliminate the RET, both in 1990, and would limit recomputation only to those individuals not collecting benefits.

Simulations suggest that this proposal would increase work by 65-69 year olds by about 5%, or about 40,000 workers per year over the next two decades. The number would be still higher except for the condition on recomputation, which create a disincentive for work. The change would have a high ultimate cost, around $37 billion, although in the first decade it would generate a surplus of about $8 billion. The short run surplus accrues largely because many workers will find it advantageous to delay registering for benefits, and the long run costs arise because the inducement to delay registration is a better than fair actuarial return, which eventually must be paid. Both the short run surplus and the long run costs assume that full-time workers will delay registering for benefits if they can substantially increase the value of their benefits by doing so. To the extent that full-time workers register anyway, these effects are smaller and may even be reversed.

The high long-run costs appear to be a property of any proposal which

involves an accelerated move to an 8% DRC. Proposals to eliminate the RET without accelerating the scheduled increases in the DRC, however, appear to have high short-run costs. These proposals do not provide any incentives to postpone benefits, and they often make it advantageous to collect benefits as soon as possible. Eliminating the RET makes it possible to act on these incentives, raising short run costs. Because benefits are not postponed at high DRC rates, though, such proposals have substantially lower long-run costs. Further, because the effects do not depend so much on the willingness of workers to postpone registration if it is to their advantage to do so, the uncertainty regarding the results is lower.

A major purpose of these proposals is to make the RET/DRC combination approximately neutral in terms of its incentives for work. However, it is apparent that no single DRC rate will ever be able to do this job. A DRC rate which encourages work and increases benefit costs for some individuals will discourage work for others. In particular, an 8% rate is more than required for neutrality for workers with spouses with a high enough PIA of their own that they will collect only survivor benefits, while it is less than is needed for workers with spouses over 65 who are collecting spouse benefits.

A number of grounds have been given for modifying regulations governing adjustments in Social Security benefits for work after normal retirement. Proposed solutions often resemble those examined here. The regulations are expensive to administer, they may be unfair, and it has been thought that they significantly discourage work effort. Our findings suggest that in considering proposals to alter social security benefit adjustments for work after normal retirement age, much of the relevant story is in the size of additional benefit payments associated with the solution. Most benefit costs will not be offset by induced increases in

taxes. Labor supply changes will be modest at best. Indeed, most of the long run changes in benefit payments will not be the result of the induced changes in labor supply. In addition, any forecast of program cost is subject to substantial error. The outcomes, especially in the short run, will vary widely with the timing of the application decision for benefits, both by full and partial retirees and by full-time workers, and the potential exists for very wide differences in the net flow of funds created by alternative policies.

## Footnotes

1. More detailed descriptions of policies under consideration at the Social Security Administration are available in Gustman and Steinmeier (1989).

2. Commerce Clearing House, Social Security Benefits, January 1, 1989, p. 18.

3. Social Security Administration, 1987, p. 28.

4. An 8% DRC is also inadequate for a spouse who is collecting benefits on her own record but who will switch to survivor benefits when her husband dies. For such a woman, any increase in her own benefits will apply only as long as both she and her spouse are alive, a time period which is much too short for an 8% DRC rate to be fair.

5. Utility function parameters are not estimated from the SCF because the estimation procedure requires at least three longitudinal observations, whereas the SCF provides current labor market information only for 1983 and 1986.

6. These equations are reported in Gustman and Steinmeier (1989).

7. The simulations allow work to continue up through age 72, after which the individual is assumed to retire if he has not done so already.

8. All averages in this table are taken for the cohorts born between 1921 and 1942 during years they are between 62 and 72 and on or after 1990. This is particularly important for the last part of the results by year where, for instance, the figures for 2012 include only 70-72 year olds.

9. In the calculations for this table, the amounts for cohorts after the last cohort simulated are taken to be similar to those of the cohort of 1942. These projections materially enter only for the years 2008 and later, after which the cohort of 1943 will have reached age 65.

10. Population Statistics from Projections of the Population Of The United States, By Age, Sex and Race: 1988 to 2080 are adjusted by the proportion of workers who are employed in the private sector, not self-employed (from the Monthly Labor Review), and by the proportion of the population of males age 55 who are not disabled (from Social Security Bulletin, Annual Statistical Supplement, 1987, p. 148.)

11. A sensitivity issue not explored here is that due to model estimates. Reinsdorf (1987) claims that our model estimates overstate the labor supply response to market incentives. However, his analysis differs from ours along a number of dimensions, and in the end, his model does relatively poor job of tracing retirement outcomes.

## Figure 1. Incentive Effects for Full-Time Workers

Incentives are the dollar amounts (in 1992 dollars) from working and postponing the receipt of benefits during the indicated year. The effects are for a nonblack male earning $25,000 in 1989, reaching age 62 in 1992 and with a wife two years younger.

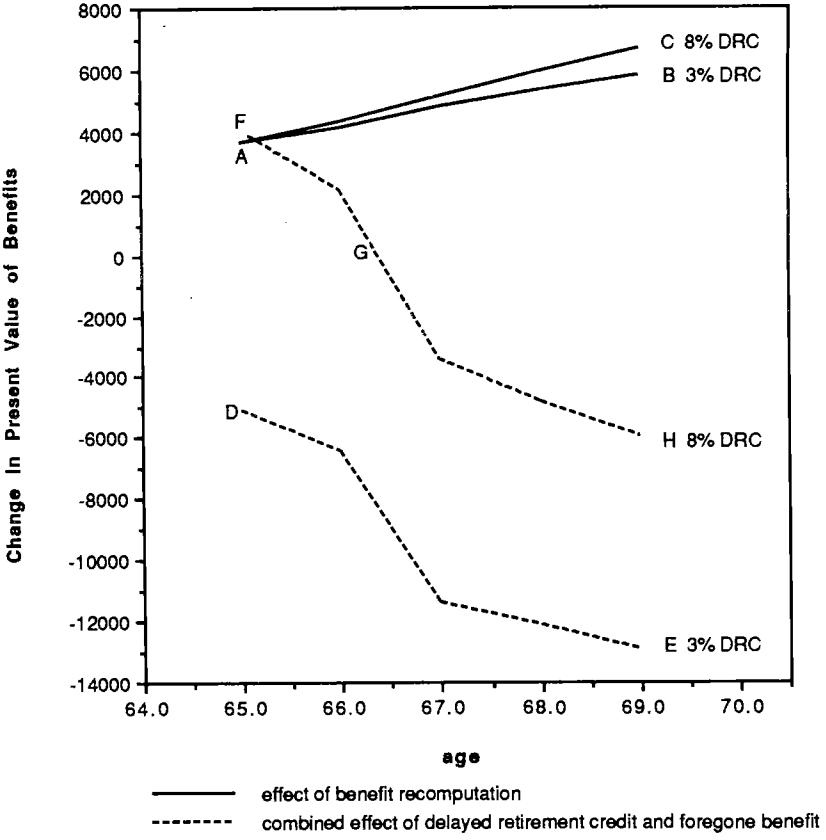

Table 1

Actuarial Gains and Losses

Figures in the table are the change in total discounted Social Security benefits resulting from postponement of application for benefits for nonblack males, expressed as a percentage of one year's benefits . Calculations are for a normal retirement age of 65.

| Age Difference Between Husband and Wife | Age of Worker 65 | 66 | 67 | 68 | 69 |
|---|---|---|---|---|---|
| **3% Delayed Retirement Credit** | | | | | |
| | Worker Benefits Only | | | | |
| | -65.0% | -67.3% | -69.5% | -71.6% | -73.5% |
| | Worker, Spouse & Survivor Benefits | | | | |
| 0 | -65.6 | -67.4 | -69.1 | -70.8 | -72.4 |
| 1 | -37.6 | -66.7 | -68.4 | -70.1 | -71.7 |
| 2 | -34.5 | -40.1 | -67.7 | -69.3 | -70.9 |
| 3 | -46.6 | -37.2 | -42.4 | -68.6 | -70.2 |
| 4 | -45.6 | -48.7 | -39.7 | -44.7 | -69.5 |
| 5 | -44.7 | -47.8 | -50.7 | -42.1 | -46.9 |
| | Worker & Survivor Benefits | | | | |
| 0 | -48.5 | -51.6 | -54.6 | -57.4 | -60.0 |
| 1 | -48.6 | -50.5 | -53.5 | -56.3 | -59.0 |
| 2 | -47.6 | -50.7 | -52.4 | -55.3 | -58.0 |
| 3 | -46.6 | -49.7 | -52.7 | -54.2 | -56.9 |
| 4 | -45.6 | -48.7 | -51.7 | -54.6 | -55.8 |
| 5 | -44.7 | -47.8 | -50.7 | -53.5 | -56.3 |
| **8% Delayed Retirement Credit** | | | | | |
| | Worker Benefits Only | | | | |
| | -6.6 | -16.9 | -25.8 | -33.5 | -40.2 |
| | Worker, Spouse & Survivor Benefits | | | | |
| 0 | -8.4 | -15.9 | -22.6 | -28.8 | -34.4 |
| 1 | 21.2 | -14.0 | -20.8 | -27.1 | -32.7 |
| 2 | 27.1 | 13.0 | -19.0 | -25.3 | -31.0 |
| 3 | 42.5 | 18.4 | 5.6 | -23.4 | -29.3 |
| 4 | 45.0 | 30.5 | 10.6 | -1.0 | -27.5 |
| 5 | 47.4 | 32.8 | 20.1 | 3.6 | -7.0 |
| | Worker & Survivor Benefits | | | | |
| 0 | 37.5 | 23.1 | 10.7 | -0.1 | -9.5 |
| 1 | 37.1 | 25.9 | 13.3 | 2.4 | -7.3 |
| 2 | 39.9 | 25.3 | 16.0 | 4.9 | -4.9 |
| 3 | 42.5 | 28.0 | 15.2 | 7.4 | -2.5 |
| 4 | 45.0 | 30.5 | 17.8 | 6.5 | -0.0 |
| 5 | 47.4 | 32.8 | 20.1 | 8.9 | -1.1 |

Table 2

Labor Supply Responses

Figures in the table are percentage point differences in projections of retirement outcomes comparing the mixed policy change to current law, for males in affected cohorts.

| Year | Full Time | Partially Retired | Fully Retired |
|---|---|---|---|
| 1990 | 0.1% | 0.0% | -0.1% |
| 1991 | 0.9 | -0.4 | -0.5 |
| 1992 | 0.9 | -0.3 | -0.6 |
| 1993 | 0.9 | -0.1 | -0.7 |
| 1994 | 1.0 | -0.1 | -0.8 |
| 1995 | 1.1 | -0.2 | -0.9 |
| 1996 | 0.6 | -0.2 | -0.4 |
| 1997 | 0.9 | -0.2 | -0.6 |
| 1998 | 1.2 | -0.2 | -1.0 |
| 1999 | 0.4 | -0.0 | -0.4 |
| 2000 | 0.6 | -0.1 | -0.5 |
| 2001 | 0.7 | -0.4 | -0.3 |
| 2002 | 0.6 | -0.3 | -0.3 |
| 2003 | 0.5 | -0.2 | -0.3 |
| 2004 | 0.2 | -0.0 | -0.2 |
| 2005 | 0.1 | -0.1 | -0.0 |
| 2006 | 0.1 | -0.0 | -0.1 |
| 2007 | 0.2 | -0.1 | -0.2 |
| 2008 | 0.1 | 0.0 | -0.2 |
| 2009 | 0.2 | 0.0 | -0.2 |
| 2010 | -0.1 | 0.1 | 0.0 |
| 2011 | 0.2 | -0.1 | -0.1 |
| 2012 | -0.1 | 0.0 | 0.1 |
| 2013 | 0.0 | 0.0 | 0.0 |
| 2014 | 0.0 | 0.0 | 0.0 |

| Age | Full Time | Partially Retired | Fully Retired |
|---|---|---|---|
| 62 | 0.0% | 0.0% | 0.0% |
| 63 | 0.0 | 0.0 | -0.0 |
| 64 | 0.0 | 0.0 | 0.0 |
| 65 | 1.8 | -0.5 | -1.3 |
| 66 | 1.6 | -0.3 | -1.3 |
| 67 | 1.3 | -0.3 | -1.0 |
| 68 | 0.7 | -0.3 | -0.4 |
| 69 | 0.3 | -0.0 | -0.3 |
| 70 | 0.0 | -0.1 | 0.1 |
| 71 | 0.1 | -0.0 | -0.1 |
| 72 | -0.0 | -0.0 | 0.1 |

Table 3

Effects on Earnings, Social Security Benefits, and Taxes, by Cohort

Figures in the table are differences in per worker discounted total earnings, Social Security benefits, and taxes comparing the mixed policy change to current law, for males in affected cohorts. Dollar amounts are in 1989 dollars.

| Cohort Year | Earnings | Social Security Benefits | Percent Change In Social Security Benefits | Tax Payments |
|---|---|---|---|---|
| 1921 | $-191 | $ 44 | 0.0% | $ 44 |
| 1922 | 185 | 366 | 0.3 | 167 |
| 1923 | 338 | 1560 | 1.1 | 264 |
| 1924 | 957 | 1092 | 0.8 | 723 |
| 1925 | 882 | 1401 | 1.1 | 274 |
| 1926 | 3073 | 5951 | 4.1 | 838 |
| 1927 | 2437 | 4612 | 3.2 | 600 |
| 1928 | 4018 | 4648 | 3.4 | 1266 |
| 1929 | 2478 | 4308 | 3.5 | 865 |
| 1930 | 3112 | 3917 | 2.8 | 852 |
| 1931 | 2455 | 4081 | 2.8 | 614 |
| 1932 | 1760 | 2349 | 1.8 | 410 |
| 1933 | 1045 | 2353 | 1.7 | 195 |
| 1934 | 1078 | 2575 | 1.8 | 227 |
| 1935 | 1049 | 2356 | 1.5 | 244 |
| 1936 | 1528 | 2123 | 1.6 | 410 |
| 1937 | 1194 | 1862 | 1.2 | 250 |
| 1938 | 467 | 1538 | 1.0 | 98 |
| 1939 | 893 | 1380 | 0.8 | 266 |
| 1940 | 398 | 964 | 0.7 | 102 |
| 1941 | 60 | 369 | 0.3 | 33 |
| 1942 | 151 | 363 | 0.3 | 33 |
| Weighted Total or Average | $ 21.9 billion | $ 37.4 billion | 1.6% | $ 6.5 billion |

Table 4

Effects on Social Security Benefits and Taxes, by Year

Figures in the table are differences in Social Security benefits and taxes per Individual age 62 and older comparing the mixed policy change to current law, for males born in 1921 and later. Dollar amounts are in 1989 dollars.

| Year | Change in Benefits | Percent Change In Benefits | Change in Taxes | Percent Change In Taxes |
|---|---|---|---|---|
| 1990 | $ 197 | 9.3% | $ 25 | 1.7% |
| 1991 | 69 | 2.9 | 44 | 2.5 |
| 1992 | -6 | -0.2 | 36 | 2.1 |
| 1993 | -64 | -2.0 | 32 | 1.8 |
| 1994 | -108 | -3.5 | 42 | 2.5 |
| 1995 | -123 | -3.6 | 53 | 3.3 |
| 1996 | -83 | -2.3 | 16 | 1.0 |
| 1997 | -71 | -1.9 | 30 | 1.9 |
| 1998 | -91 | -2.3 | 48 | 3.1 |
| 1999 | -64 | -1.6 | 9 | 0.6 |
| 2000 | -18 | -0.4 | 24 | 1.5 |
| 2001 | 19 | 0.4 | 19 | 1.1 |
| 2002 | 39 | 0.9 | 19 | 1.1 |
| 2003 | 38 | 0.8 | 13 | 0.8 |
| 2004 | 39 | 0.8 | 9 | 0.6 |
| 2005 | 66 | 1.4 | 4 | 0.2 |
| 2006 | 102 | 2.1 | 4 | 0.3 |
| 2007 | 77 | 1.5 | 4 | 0.3 |
| 2008 | 110 | 2.1 | 9 | 0.8 |
| 2009 | 96 | 1.8 | 18 | 1.9 |
| 2010 | 102 | 2.0 | 0 | 0.0 |
| 2011 | 90 | 1.7 | 1 | 0.1 |
| 2012 | 66 | 1.2 | -2 | -0.4 |
| 2013 | 75 | 1.5 | 2 | 0.4 |
| 2014 | 67 | 1.4 | 1 | 0.3 |

Table 5

Distributional Implications Of The Mixed Policy

| Potential Earnings Bracket (in 1989 dollars) | Percent Change in Lifetime Social Security Benefits | Percent of Additional Benefits Covered by Taxes |
|---|---|---|
| $ 0- 8678 | 0.7% | -3.2% |
| 8678-11531 | 0.6 | 25.2 |
| 11531-13568 | 1.4 | 5.2 |
| 13568-14955 | 1.6 | 2.1 |
| 14955-16702 | 1.0 | 11.4 |
| 16702-18081 | 1.2 | 8.2 |
| 18081-19758 | 1.2 | 10.3 |
| 19758-21659 | 1.7 | 15.2 |
| 21659-23231 | 1.1 | 22.8 |
| 23231-24381 | 0.6 | 45.6 |
| 24381-25550 | 2.0 | 12.2 |
| 25550-27205 | 1.4 | 23.1 |
| 27205-28831 | 0.9 | 17.3 |
| 28831-30863 | 1.8 | 23.5 |
| 30863-33240 | 1.3 | 24.6 |
| 33240-36469 | 1.8 | 18.9 |
| 36469-39571 | 2.1 | 21.7 |
| 39571-46089 | 2.1 | 10.6 |
| 46089-60617 | 2.0 | 12.0 |
| 60617- | 3.0 | 21.3 |

Table 6

Effects of Alternative Policies

Figures in the table are differences in outcomes comparing the specified policy alternative to current law, for males in affected cohorts. Dollar amounts are in 1989 dollars.

| | Policy Alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Mixed Policy Change | | | Gradual Rise in AEA | Eliminate RET | Raise DRC | Raise DRC and Eliminate RET | Eliminate RET and DRC |
| | Immediate | Phase In by Cohort | AEA Phase Out | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Additional Full-Time 62-72 Year Old Workers (Thousands per Year) | 40 | 32 | 31 | 8 | 17 | 45 | 47 | 3 |
| Present Value of Additional Benefits (Billions of Dollars) | 37 | 29 | 26 | 6 | 20 | 53 | 56 | 13 |
| Present Value of Additional Taxes (Billions of Dollars) | 6 | 5 | 4 | 3 | 9 | 6 | 10 | 11 |
| Present Value of Additional Benefits in First Ten Years (Billions of Dollars) | -4 | -7 | -5 | 9 | 31 | -2 | 8 | 37 |
| Present Value of Additional Taxes in First Ten Years (Billions of Dollars) | 4 | 3 | 2 | 2 | 6 | 4 | 5 | 7 |
| Eliminate RET | x | x | x | | x | | x | x |
| Advance Date of DRC Increase | x | x | x | | | x | x | |
| Change Recomputation Rules | x | x | x | | | | | |

Table 7

Sensitivity to Behavioral Assumptions

Figures in the table are differences in outcomes comparing the mixed policy change to current law, for males in affected cohorts. Dollar amounts are in 1989 dollars.

| | Behavioral Assumption | | | |
|---|---|---|---|---|
| | Only Full_Time Workers Time Benefit Application to Maximize Value | Workers and Retirees Time Benefit Application to Maximize Value | Workers and Retirees Claim Benefits As Soon As Possible | Survivor Benefits Are Disregarded in Labor Supply Decisions |
| Additional Full-Time 62-72 Year Old Workers (Thousands per Year) | 40 | 21 | -29 | 16 |
| Present Value of Additional Benefits (Billions of Dollars) | 37 | 79 | -12 | 23 |
| Present Value of Additional Taxes (Billions of Dollars) | 6 | 3 | 4 | 7 |
| Present Value of Additional Benefits in First Ten Years (Billions of Dollars) | -4 | -58 | 32 | 10 |
| Present Value of Additional Taxes in First Ten Years (Billions of Dollars) | 4 | 2 | 4 | 4 |

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