

NBER Social Security Working Group session with members of the 2003 Social Security Advisory Board Technical Panel

July 30, 2003

Background

Every year, the Office of the Chief Actuary within the Social Security Administration develops long-term projections of income and costs for the OASDI Trust Funds. The major assumptions underlying the projections are chosen by the Board of Trustees of the Social Security system, which includes as members the Secretary of the Treasury, the Secretary of Labor, the Secretary of Health and Human Services, the Commissioner of Social Security and two appointed public trustees. Projection results are published in the annual Trustees Report (available at <http://www.ssa.gov/OACT/TR/TR03/trTOC.html>).

The projections require assumptions regarding demographic, economic and program-specific trends. Demographic assumptions are made regarding fertility, mortality and immigration. Economic assumptions are made regarding productivity, inflation, nominal and real earnings, labor force participation and unemployment, gross domestic product and interest rates. Key demographic and economic assumptions made for the forecasts contained in the 2003 Trustees Report include the following:

Ultimate assumptions	Intermediate	Low Cost	High Cost
Total fertility rate (children per woman)	1.95	2.2	1.7
Average annual percentage reduction in total age-sex-adjusted death rates from 2027 to 2077	.73	.34	1.27
Annual net immigration (in thousands)	900	1,300	672.5
Annual percentage change in:			
Average wage in covered employment	4.1	3.6	4.6
Consumer Price Index (CPI)	3.0	2.0	4.0
Real-wage differential (percent)	1.1	1.6	.6
Productivity (total U.S. economy)	1.6	1.9	1.3
Unemployment rate (percent)	5.5	4.5	6.5
Annual trust fund interest rate (percent)	6.0	5.7	6.2

Source: 2003 OASDI Trustees Report

Although labor productivity growth and real wage growth (labeled the “real wage differential” in the preceding summary table) are closely related, labor productivity growth does not translate directly into real wage growth. The linkages between productivity and real wage growth and the growth rates of the linkage factors assumed in the current Trustees Report are as follows:

$$\left(\frac{\text{earnings/CPI}}{\text{employment}} \right) = \left(\frac{\text{GDP/GDP deflator}}{\text{total hours}} \right) \left(\frac{\text{compensation}}{\text{GDP}} \right) \left(\frac{\text{earnings}}{\text{compensation}} \right)$$

[1.1 percent/yr]
[1.6 percent/yr]
[no change]
[-0.2 percent/yr]

$$\left(\frac{\text{total hours}}{\text{employment}} \right) \left(\frac{\text{GDP deflator}}{\text{CPI}} \right)$$

[no change]
[-0.3 percent/yr]

Taken together, the projected labor force participation rate (not shown in the summary table) and unemployment rate determine the employment to population ratio.

In addition to making demographic and economic assumptions, the Trustees make program-specific projections of such things as covered employment, taxable payroll and payroll tax revenue, the size of the insured population, the number of both OASI and DI beneficiaries, and so on. By design, the Trustees’ projections are made assuming that all current laws governing the Social Security system remain in force in their present form.

Since the early 1970s, panels of experts have been convened with some regularity to provide advice regarding the assumptions and the methods used for the OASDI Trust Fund projections. While these panels generally have been asked to review all of the assumptions that enter into the projections, they commonly are charged with focusing particular attention on some special topic. The 1999 technical panel, for example, was charged with making recommendations regarding returns to investments in equities. The charter for the 2003 technical panel, reproduced as Attachment 1, asks this group to focus particular attention on the likely rate of labor force participation of older persons.

Discussion Questions

While any comments regarding the assumptions and methods used in producing the annual OASDI Trustees' Report would be welcome, the Panel would especially appreciate input from the Social Security Working Group on the following questions.

- (1) For much of the 20th century, labor force participation at older ages fell, particularly among men. Since the mid-1980s, as shown in Attachment 2, older men's labor force participation rates have leveled off, while older women's have risen somewhat. The Trustees' recent labor force participation projections assume that scheduled increases in the normal retirement age will raise labor force participation rates among older workers in the future; details are provided in Attachment 3. The labor force projection model also includes a term intended to capture the effects of the earnings test on labor force participation. The earnings test was eliminated in 2000 for those past the normal retirement age. Because the labor force projections assume that the full effects of any changes in the earnings test are realized immediately, however, no future changes in labor force participation resulting from the 2000 change are predicted.

In addition, the 2003 Trustees' report incorporates a new upward adjustment to projected labor force participation rates at older ages based on the idea that as life expectancies increase, people will tend to work longer, all else the same. The adjustment begins with the labor force participation rates experienced by past generations at the same time-until-death. If life expectancy were to increase by 3 years over some period, for example, an extreme assumption might be that 58 year olds would behave as though they were 55 year olds. The actual adjustment incorporates only a quarter of this effect. Sticking with our example of a 3-year increase in life expectancy and supposing that 55 year olds had a labor force participation rate 12 percentage points higher than 58 year olds, the projected labor rate for 58 year olds would be increased by $0.25 \times (12 \text{ percentage points})$ or 3 percentage points. A more technical description of this new adjustment is provided in Attachment 4, together with a graph showing the adjustment's effect on projected labor force participation rates.

Do you have any comments regarding the treatment of planned increases in the normal retirement age, the recent elimination of the earnings test for workers above normal retirement age or anticipated increases in longevity in the Trustees' labor force participation projections? More generally, what factors can be expected to affect future labor force participation rates among the older population?

- (2) Average weekly paid hours fell from 39.7 hours in 1948 to 34.0 hours in 1983, continuing a secular decline that had begun much earlier. Since the mid-1980s, average weekly hours have not fallen and in fact have increased slightly, to 35.6 hours in 2000 and 35.5 hours in 2001, according to the calculations of the Office of the Actuary. The trend in average weekly paid hours since 1948 is shown in

Attachment 5. The current Trustees' assumption is that average weekly paid hours will remain constant over the projection period. Is this a reasonable assumption? If labor force participation rates at older ages are projected to rise, should this be expected to affect average weekly paid hours?

- (3) Historically, wages have represented a shrinking share of total labor compensation, though as can be seen in Attachment 6, the wage share of total labor compensation has leveled off since about 1980. The current Trustees' assumption is that the share of wages in total compensation will fall by 0.2 percent per year, which implies that the wage share of labor compensation will decline from about 86 percent today to about 73 percent after 75 years. The principal driver behind this assumption is the belief that the costs of employer-provided health care will continue to grow more rapidly than overall compensation. Larger anticipated employer pension contributions, necessary because of stock market returns that lag those of the 1990s, are a secondary factor.

Is the assumption of continuing decline in the ratio of wages to total compensation reasonable? If so, over what time horizon? If not, what would be a more reasonable assumption?

- (4) The incidence and prevalence of disability benefit receipt play an important role in the health of the OASDI Trust Funds. As shown in the top panel of Attachment 7, age-adjusted disability award rates have fluctuated considerably over time. Age-adjusted mortality among disability benefit recipients, shown in the second graph on the same page, also has fluctuated considerably from one year to the next. Age-adjusted mortality rates for the full SSA population, displayed on a different scale, are shown for comparison purposes in the second graph. No formal modeling underlies the Trustees' projections of disability award rates or mortality among disability beneficiaries. Disability award rates are projected to stabilize in the future; the projected proportional decline in mortality among disability benefit recipients tracks assumed mortality declines in the general population.

What factors can be expected to affect disability award rates in the future, assuming the current law does not change? What factors can be expected to affect mortality among recipients of disability benefits? Are the benefit award and mortality rates currently projected by the Trustees reasonable in view of currently available information? Should more formal modeling be used to project future award or mortality rates? If so, what modeling approaches should be considered?

Charter

2003 Technical Panel on Assumptions and Methods

The Panel of expert actuaries, economists, and demographers appointed by the Social Security Advisory Board is charged with providing technical assistance to the Board by reviewing the assumptions specified by the Board of Trustees of the Old- Age and Survivors Insurance Trust Fund and the Disability Insurance Trust Fund and the methods used by the Social Security Actuaries to project the future financial status of the funds. Specifically, the Panel is asked to:

- v Review the assumptions regarding key demographic factors, including mortality, fertility, immigration, and disability incidence and termination,
- v Review the assumptions regarding key economic factors, including productivity, real wage growth, real net rates of return and variations in net rates of return (including equity returns), consumer price increases, labor force participation, and rates of employment and unemployment.
- v Review in particular the likely rate of labor force participation of older persons.
- v Review and assess the projection methodology.
- v Review and assess the status of the recommendations of the 1999 technical panel.

Figure 5.1

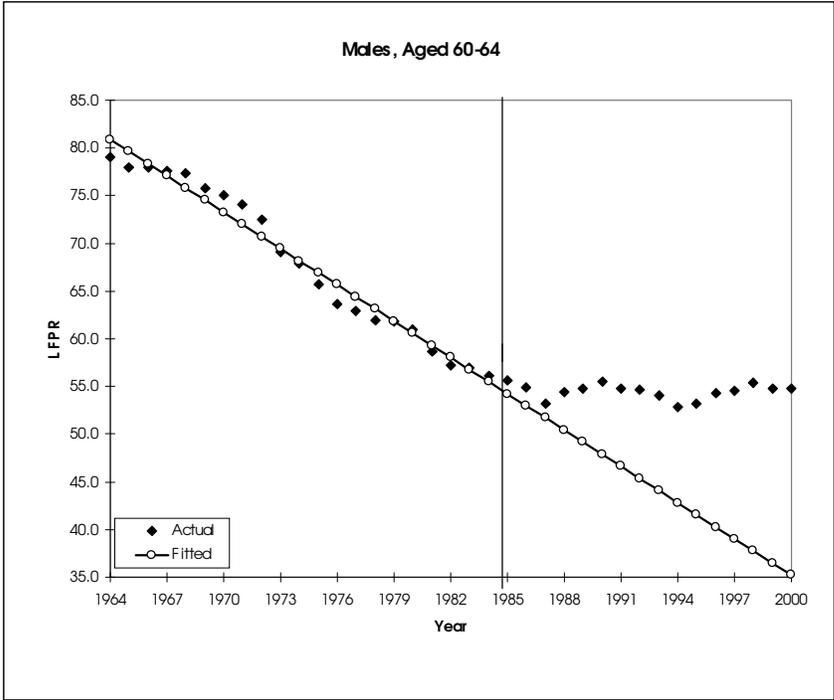
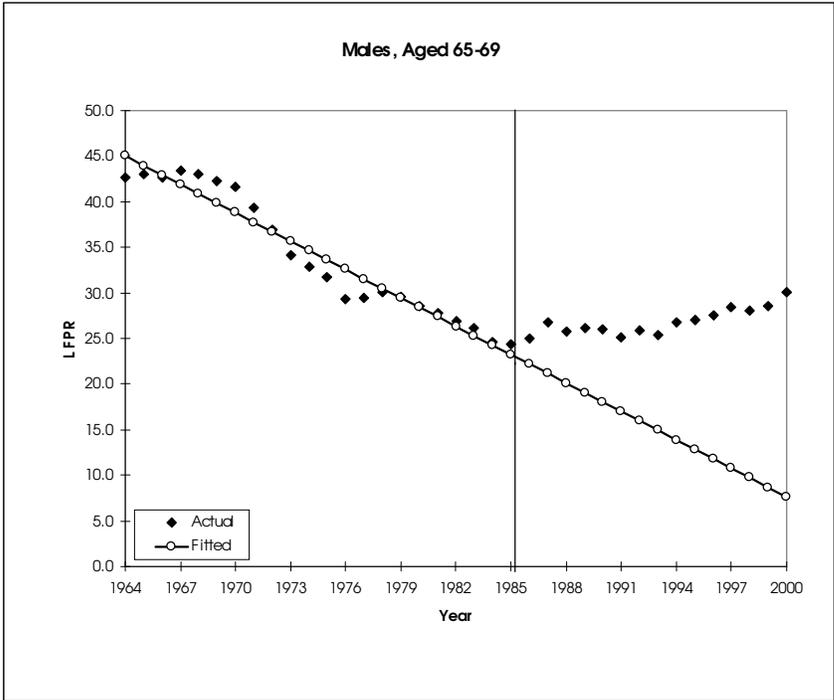


Figure 5.2



Source: Tabulations of CPS data by Joseph Quinn.

Figure 5.3

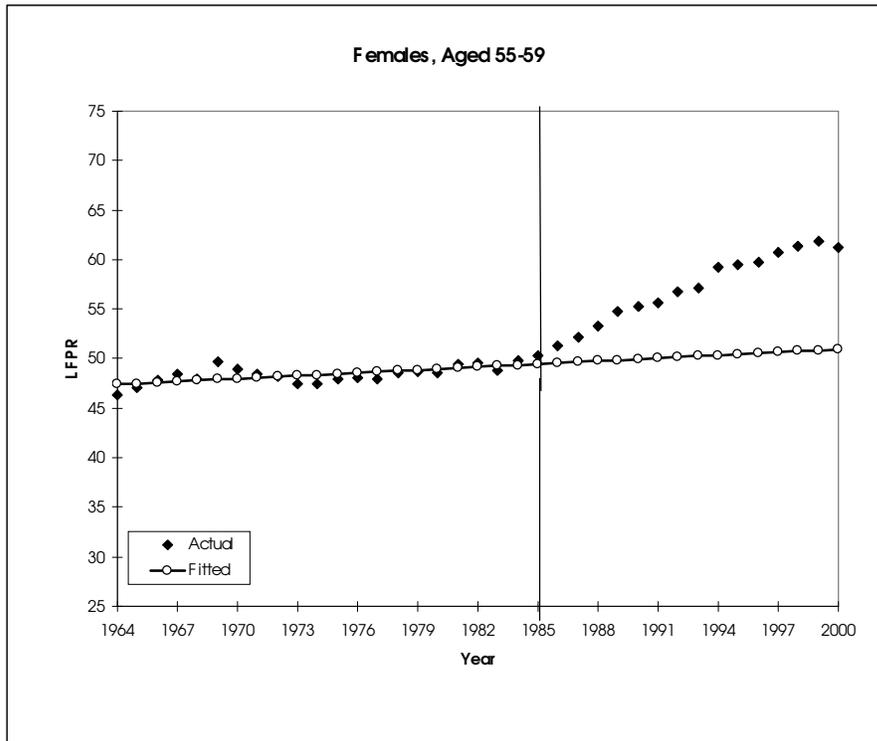
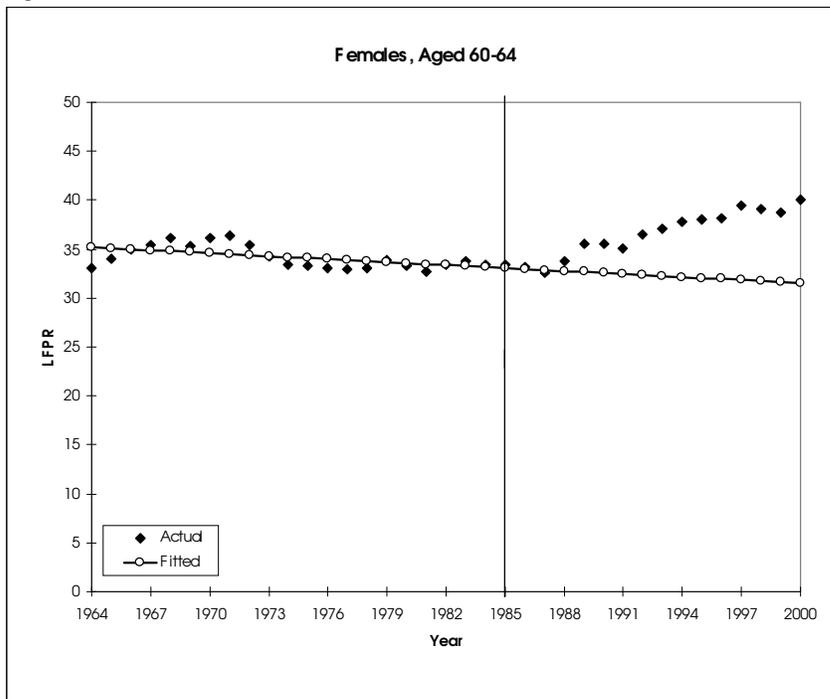


Figure 5.4



Source: Tabulations of CPS data by Joseph Quinn.

NOTE

Date: February 11, 2003

To: Bob Clark

From: J. Patrick Skirvin & Karen G. Smith
Office of the Chief Actuary
Social Security Administration

Subject: EFFECT OF CHANGE IN SOCIAL SECURITY'S NORMAL
RETIREMENT AGE ON LABOR FORCE PARTICIPATION RATES

At the Technical Panel Meeting on February 7, we discussed the relationship between the scheduled increases in the Social Security normal retirement age (NRA) and the projected labor force participation rates (LFPR) for older workers. In describing this relationship in our LFPR Model, we stated that, "there is a -1.0 elasticity coefficient between changes in the benefit replacement rate and percent changes in the LFPR."

The equation below states the relationship used in our model. (The PIA replacement rate is the ratio of the primary insurance amount (PIA) to the workers career-average wage level, indexed up to the prior year. The benefit replacement rate for those below the NRA is the product of the PIA replacement rate and an adjustment factor defined as 1 minus the benefit reduction rate.) This equation was developed from testing a series of regressions that used various growth rate formulations relating the LFPR to the benefit replacement rate for various age groups.

$$\text{Percent Change in LRPR} = -1.0 * \text{Percentage Point Change in the Benefit Replacement Rate}$$

Using age 62 as an example, the benefit reduction rate is scheduled to change from 20.0 to 30.0 percentage points due to the change in the NRA from 65 to 67. This means the adjustment factor is expected to fall from 80.0 to 70.0 percent, or by about 12.5 percent (i.e., $(1.0-0.3)/(1.0-0.20)-1.0$). Given that the level of the replacement rate is about 34.0 in 2000, we would project it to fall to about 30.0 (i.e., $34.0 * (1.0-0.125)$) by 2025, or by about 4.0 percentage points. Thus, in our model, for those aged 62, we would project about a **4.0 percent relative** increase in the LFPR, due to a **4.0 percentage point** (12.0 percent) decline in the benefit replacement rate associated with the increase in the NRA from 65 to 67.

Because the LFPR for males age 62 in 2000 was about 53.0 percent, this approach would imply about a 2.0 percentage point increase ($1.04 * 53.0 = 55.1$) in their LFPR due to increasing the NRA from 65 to 67. Smaller increases are implied for ages above 62, and for females, because their LFPRs are smaller and because the adjustments to benefit replacement rates are less.

It is important to note that this method would imply a 16.0 percentage point increase in the male LFPR at age 62, from 53.0 to 71.0 percent ($53.0 * (1 + (-1.0 * (-.34)))$), if Social Security retirement benefits were eliminated (i.e., if the benefit replacement rate were reduced by 100.0 percent). This test of the method at the “extreme” results in an estimated LFPR at age 62 that is close to male LFPRs at lower ages where retirement benefits are not available. For example, in 2000, the LFPRs for males aged 59, 60, and 61, were 71.0, 66.0, and 66.0 percent, respectively. Furthermore, this method would imply a similar “extreme” result for females aged 62. That is, if Social Security retirement benefits were eliminated in 2000, this method would imply a 13.0 percentage point increase in the female LFPR at age 62, from 39.0 to 52.0 percent ($39.0 * (1 + (-1.0 * (-.34)))$), compared to the LFPR in 2000 for females aged 59, 60, and 61, of 55.0, 52.0, and 46.0 percent, respectively.

CC Steve Goss, Alice Wade, Joe Humphries, Noah Meyerson

Adjustment to LFPRs due to Changes in Life Expectancy in the
2003 Trustees Report
(April 11, 2003)

It seems reasonable to assume that projected increases in life expectancy will lead to increases in LFPRs. A longer life implies a higher level of financial resources needed for retirement, and thus a greater need to work when relatively younger. Thus, starting with the 2003 Trustees Report, the Office of the Chief Actuary (OCAct) takes changes in life expectancy into account when projecting LFPRs by age and sex.

EQ1 through EQ4 help explain the OCAct methodology used to adjust the LFPRs due to the projected change in life expectancy. EQ1 calculates the total projected change in life expectancy (TDLE) from 2001 to 2080 for each age group. The TDLE is set equal to the life expectancy (LE) in 2080 less the LE in 2001. EQ2 attempts to answer the question, what would the potential maximum LFPR be in 2001 for a particular age group if their life expectancy was equal to the level projected for 2080? This potential maximum LFPR (i.e., MAX_LFPR) for a particular age group is assumed to be equal to the LFPR in 2001 for workers who are younger by TDLE. EQ3 estimates the maximum potential adjustment to the LFPR (i.e., MAXADJ_LFPR) for each age group in 2080, due to the change in life expectancy from 2001 to 2080. MAXADJ_LFPR is defined as MAX_LFPR less the actual LFPR for the age group in 2001. EQ4 estimates the actual adjustment to the LFPR (i.e., ACTADJ_LFPR) for each age group in 2080, due to the change in life expectancy from 2001 to 2080. ACTADJ_LFPR is defined as the product of MAXADJ_LFPR and a weight that can range from 0.0 to 1.0. For the 2003 Trustees Report, the weight was set to 0.25. The relatively low value for the weight is consistent with gradually introducing an adjustment that links the LFPR to life expectancy while further researching the relationship.

$$\begin{aligned}
 \text{EQ1} \quad \text{TDLE} &= \text{LE}_{t=2080} - \text{LE}_{t=2001} \\
 \text{EQ2} \quad \text{MAX_LFPR}_a &= \text{LFPR}_{a-\text{tdle}, t=2001} \\
 \text{EQ3} \quad \text{MAXADJ_LFPR}_a &= \text{MAX_LFPR}_a - \text{LFPR}_{a,t=2001} \\
 \text{EQ4} \quad \text{ACTADJ_LFPR}_a &= \text{MAXADJ_LFPR}_a * \text{Weight}
 \end{aligned}$$

Where,

$$\begin{aligned}
 a &= \text{age} \\
 t &= \text{time} \\
 \text{LE} &= \text{Life Expectancy} \\
 \text{LFPR} &= \text{Labor Force Participation Rate} \\
 \text{Weight} &= \text{Value from 0.0 to 1.0}
 \end{aligned}$$

Two additional adjustments were introduced. First, in the above specification, a positive value for MAXADJ_LFPR is assumed to be due only to a life expectancy effect caused by the difference in life expectancy between the two age-groups (i.e., those aged (a) and those younger who are aged ((a) less TDLE)). However, the actual historical LFPRs have a greater than average decline between the ages of 61 and 62, compared to younger and older workers. (There was no similar decline between the ages of 64 and 65.)

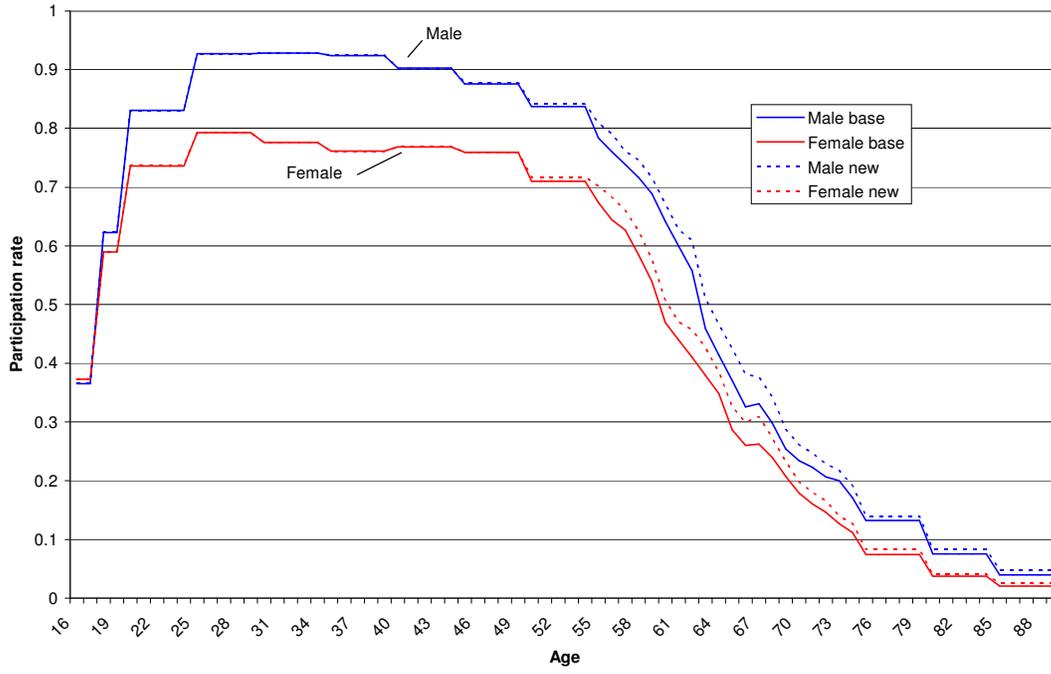
Presumably, this decline is due to workers retiring at the early retirement age for worker benefits. Thus, as presently configured for those age 62 and older, MAXADJ_LFPR could include a retirement effect and be overstated. To remove this retirement effect, MAXADJ_LFPR was recalculated using estimated values for MAX_LFPR and LFPR. The estimated values were based on two regressions relating age to the actual 2001 LFPRs for ages 57 through 61 for females, and ages 63 to 68 for males

Concerning the second adjustment, since the disability prevalence rate (defined as the ratio of disabled worker beneficiaries in current pay status to the population) rises with age and since an increase in the disability prevalence rate is expected to lower the LFPR by an equal amount, part or all of MAX_LFPR may be due to relative differences in the disability prevalence rates between the two age groups. To remove this effect, an adjusted LFPR was used in the above specification and was defined as the sum of the LFPR and the disability prevalence rate.

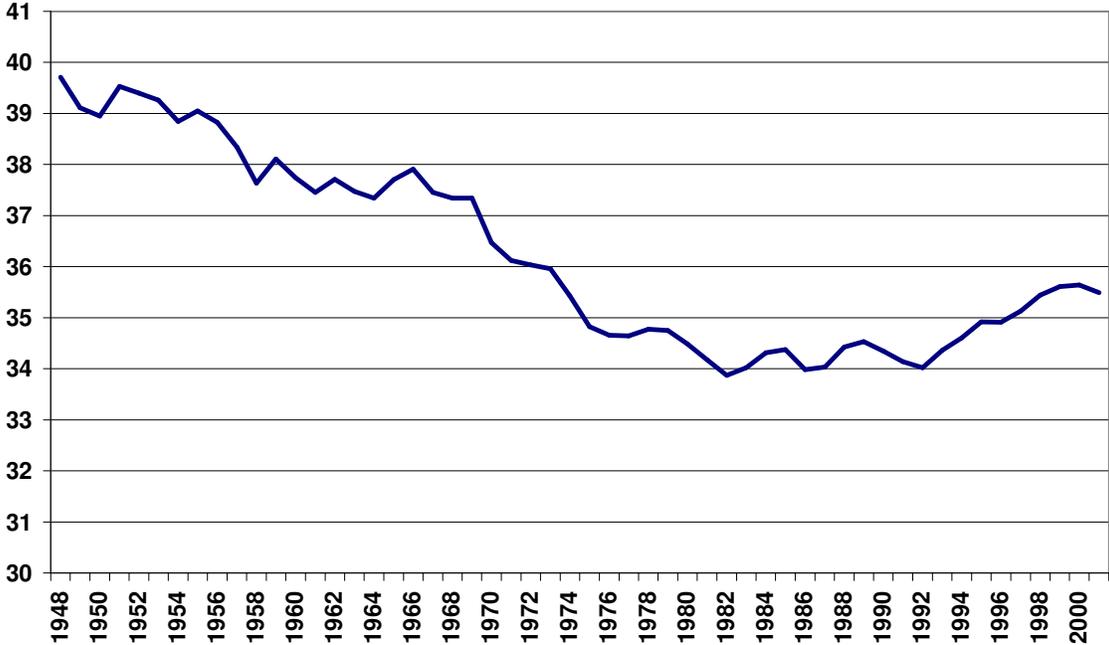
Due to including the effect of EQ1 through EQ4 in the 2003 Trustees Report, the aggregate LFPR in 2080 was projected to increase from 58.08 to 59.13 percentage points, or by about 1.8 percent ($59.13/58.08$). Thus, if the weight had been 1.0 (instead of 0.25), the aggregate LFPR in 2080 would have risen to 62.26 percentage points, an increase of about 7.2 percent ($1.8 * 1.0/0.25$).

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Social Security Administration

2080 participation rates (with and without life expectancy adjustment)

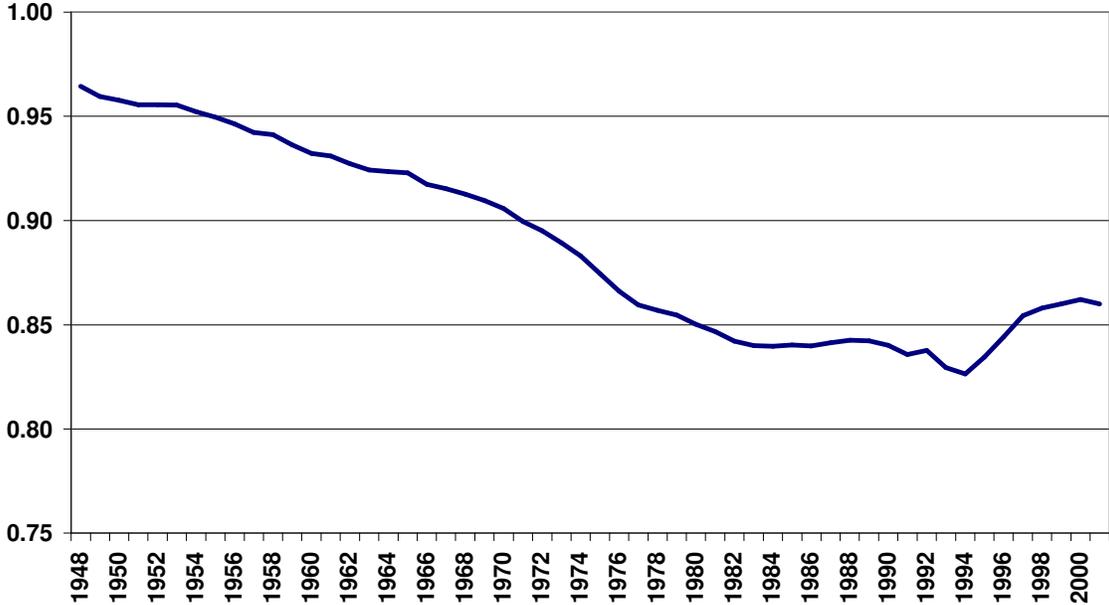


Trend in Average Weekly Paid Hours



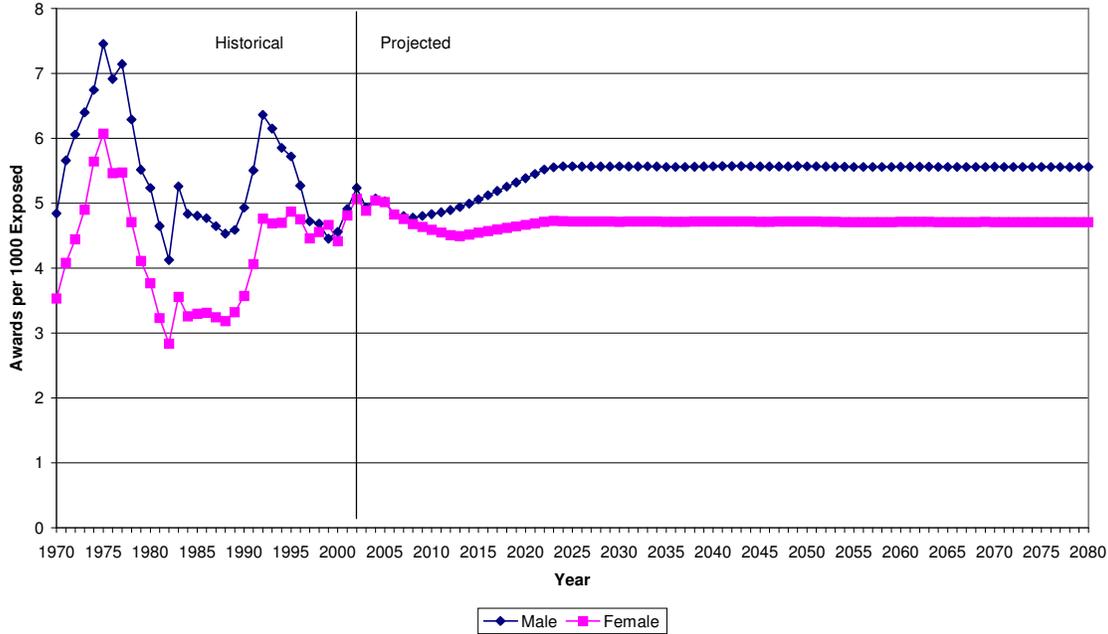
Source: Calculations using data from the Bureau of Labor Statistics performed by J. Patrick Skirvin, Office of the Chief Actuary, Social Security Administration. Average weekly hours equal total annual hours divided by 52 times average monthly employment. The total annual hours estimates were provided by the Office of Productivity and Technology, Bureau of Labor Statistics, and are based primarily on the monthly employer payroll survey, with nonproduction and supervisory worker hours imputed in the same fashion as for the BLS productivity calculations and appropriate adjustments made to account for uncovered sectors. Average employment is a CPS figure, with an adjustment to account for armed forces employment. The figures reported are benchmarked to the 1990 Census; benchmarking to the 2000 Census will raise employment and reduce average weekly hours for 2000 and later years. In 2001, for example, employment will be 1.4 percent higher and average weekly hours will fall from 35.5 hours to 35.0 hours.

Trend in the Ratio of Total Earnings to Total Compensation



Source: Calculations using National Income and Product Account data from the Bureau of Economic Analysis performed by J. Patrick Skirvin, Office of the Chief Actuary, Social Security Administration. The numerator of the ratio equals farm and nonfarm proprietors' income plus wage and salary disbursements; the denominator equals farm and nonfarm proprietors' income plus total employee compensation, including social insurance contributions and employer-provided benefit costs.

Age Adjusted Disability Award Rates
 (Age Adjusted to the January 1, 1996 Exposed Population)
 (Note: Projected values are based on no increase in the NRA)



Age Adjusted Death Rates of Disabled Workers and SSA Population
 (DI: Age Adjusted to the January 1, 1996 In Current Pay (ICP))
 (SSA Population: Age Adjusted to the 1990 Census)

