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Looming Financial Challenges

Social Security will face financial challenges sooner than was expected. New actuarial projections show income from taxes will fall short of covering outgo for benefits and other expenses beginning in 2016, one year earlier than was projected a year ago. If the imbalance between income and outgo isn't addressed, benefits will have to be reduced by more than 20 percent after 2037, four years earlier than was anticipated last year. A more immediate problem is the growing burden Social Security will place on the federal budget after 2016, when Social Security starts to run cash deficits.

Changes in this picture since last year mainly reflect the poor short-range economy and lower expected death rates from heart disease and cancer at ages 65 to 84.

To bring income and outgo into balance, Congress needs to act reasonably soon.

- A primary goal of Social Security reform should be sustainable solvency, setting the program on a path toward paying benefits when due for the next 75 years and beyond.
- With retirees living longer and longer, the American Academy of Actuaries has recommended that increasing the retirement age be a part of any reform proposal.

An Actuarial Perspective on the 2009 Social Security Trustees' Report

The Trustees' Report for the Old-Age, Survivors, and Disability Insurance (OASDI) program is a detailed annual checkup that's generally the starting point for discussions of Social Security's financial problems and solutions. Because future events are inherently uncertain, the report contains three 75-year financial projections to show a range of possibilities based on separate sets of assumptions. Social Security's chief actuary prepares and certifies the financial projections under the direction of the trustees. These projections are called intermediate, low-cost, and high-cost. The trustees consider the intermediate projection to be their best estimate. All estimates given here are based on the intermediate projection unless otherwise noted.

OVERVIEW OF FINANCIAL STATUS

Short-Range Estimates, 2009–18

Projected Social Security finances during this next decade are much weaker than anticipated a year ago, as the current recession is affecting both income and outgo. Projected income from payroll taxes is down because of unemployment, while the numbers of people who get disability benefits are up.

In 2009, Social Security income is expected to exceed outgo by about \$137 billion. Of this amount, only \$19 billion is cash surplus, that is, income from taxes less payouts for benefits and expenses. The other \$118 billion of surplus is from interest credited by the U.S. Treasury on assets in the trust funds.

Any excess of tax income over outgo is used by Treasury to pay for

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1850 M Street NW, Suite 300, Washington, DC 20036 Tel 202 223 8196, Fax 202 872 1948 www.actuary.org

> Mary Downs, Interim Executive Director Steve Sullivan, Director of Communications Craig Hanna, Director of Public Policy Frank Todisco, Senior Pension Fellow Jessica Thomas, Pension Policy Analyst

other government programs and is recorded as an asset in the Social Security trust funds. These assets are held in special Treasury bonds, amounting to over \$2.4 trillion at the end of 2008. The bonds in the trust funds represent the government's commitment to repay the borrowed cash whenever Social Security needs the money.

Social Security's annual cash surplus has been decreasing and soon will end. Benefit payments are increasing rapidly over the next decade while payroll tax revenue fails to keep pace, turning the annual cash surplus into a deficit in 2016, one year earlier than projected a year ago. Beginning in 2016, Treasury must provide growing amounts of cash to permit payment of Social Security benefits. Treasury can get this cash by borrowing from other sources, by reducing government spending, or by raising taxes.

It's helpful to express the annual amounts of cash income and outgo as percentages of taxable payroll. These percentages are known as the **income rate** and **cost rate**, respectively. From 2009 to 2018, the income rate will increase slightly, from 12.83 percent of taxable payroll to 13.00 percent. Meanwhile, the cost rate will rise from 12.35 percent of taxable payroll to 13.83 percent. The difference between these two rates, called the **annual balance**, goes from a surplus in 2009 of 0.48 percent of taxable payroll to a deficit in 2018 of 0.83 percent.

Long-Range Estimates, 2009–83

The 75-year projections cover the future lifetimes of nearly all current participants. The estimates show expenditures rising rapidly during 2010 to 2030 as the baby boomers retire, exceeding tax income after 2015. From 2016 on, Treasury must supplement tax income with increasingly large amounts of cash to cover benefit payments. While costs increase, tax revenue will grow very slowly.

After 2030, projected costs are fairly level. By 2037, four years earlier than previously estimated, Treasury is expected to have repaid all the money borrowed from Social Security, that is, the trust funds are used up. By that time, the income rate will have fallen below 80 percent of the cost rate. After 2037, under current law, Social Security income will be enough to pay only some 74 percent to 76 percent of scheduled benefits, as shown in Figure 1.

This financial projection is less favorable



Figure 1: Projected Annual Cost and Tax Income as a Percentage of Taxable Payroll

Members of the Social Insurance Committee who participated in drafting this issue brief include: Richard Schreitmueller, FSA, MAAA, chairperson; Janet Barr, EA, ASA, MAAA; Michael Callahan, EA, FSPA. MAAA; Eric Klieber, EA, FSA, MAAA; Eric Lofgren, FCA, FSA, MAAA; Michael Peskin, AIA, ASA, CERA, FCA, MAAA; Bruce Schobel, FSA, FCA. MAAA; P.J. Eric Stallard, ASA, FCA, MAAA; Louis Weisz, FSA, MAAA.

than last year's. Aside from effects of the current recession, the estimates now reflect faster declines in death rates from heart disease and cancer at ages 65 to 84. Changes in other actuarial assumptions and methods have relatively minor effects on the end results.

PROGRAM REFORM

Causes of the long-range financial problems are mainly demographic. Large numbers of baby boomers are reaching retirement age in the next two decades, and the longevity of retirees is gradually increasing. More important, birth rates have been at historically low levels for many years. The number of workers for each Social Security beneficiary is expected to fall from 3.1 in 2009 to 2.1 in 2035, then decrease slowly to 1.9 at the end of the projection period.

Figure 2 shows the projected growth in numbers of Social Security beneficiaries relative to the working population under the three sets of assumptions. Because the program financing is nearly pay-as-you-go, the three alternative projections of long-range cost show very similar patterns.

Congress is very unlikely to let this popular program simply run out of money to pay in full whatever benefits are scheduled in the future. A primary goal of reform should be sustainable solvency, setting the program on a path toward paying benefits when due for 75 years and beyond. Still, because the future is uncertain, further program changes are inevitable regardless of current reforms.

The trustees note that providing for solvency beyond the next 75 years would require changes to deal with increasing longevity, as people would be receiving benefits for ever-longer periods of retirement. A recent statement from the American Academy of Actuaries also addresses the longevity issue: "Demographic problems require demographic solutions. You just cannot have people living longer and longer with a frozen retirement age....(A)s actuaries, we believe that increasing the retirement age should be a part of any solution."

Regardless of the types of changes made, Social Security reform will best serve the public if enacted soon. Some advantages of acting promptly are:

- People will have more time to plan for retirement with these changes in mind
- The changes needed can be more gradual
- Lawmakers can choose from a full range of options



Figure 2: Number of Social Security Beneficiaries Per 100 Workers

APPENDIX

Other Measures of Financial Status

The program's long-range financial status can be measured in terms of annual costs vs. income, discussed above, or in other ways to be covered here.

Actuarial Balance

The **actuarial balance** is calculated as the difference between the summarized income rate and the summarized cost rate over a period of years. For purposes of evaluating the program's financial adequacy, these amounts are adjusted to include the cost of reaching and maintaining a target trust fund level equal to one year's outgo, as shown in Table 1.

In the 75-year period 2009–83, the actuarial deficit is 2.00 percent. This means an immediate increase of 2.0 percentage points in the payroll tax rate, or an equivalent benefit reduction of 13 percent or some combination of the two, would bring the program into longrange actuarial balance. This is a large increase from the comparable figure of 1.70 percent a year ago.

The high-cost 75-year projection in the Trustees' Report shows a far greater actuarial deficit, 5.32 percent of taxable payroll. The low-cost projection is much more favorable, with a small positive actuarial balance of 0.50 percent.

Trust Fund Ratios

The **trust fund ratio**, equal to trust fund assets as a percentage of the following year's cost, is an important measure of short-term solvency. A trust fund ratio of at least 100 percent indicates the ability to cover most short-term contingencies. Figure 3 shows projected trust fund ratios under all three sets of assumptions, indicating no short-range financing difficulties.

As a measure of long-range solvency, the trust fund ratio shows when the program is expected to run out of money to pay benefits scheduled under current law. Figure 3 shows such insolvency occurs in 2037 under the intermediate projection. The high-cost projection moves up the insolvency date by about 8 years, to 2029, while the low-cost projection shows the program remains solvent throughout the projection period.

Sustainable Solvency

Sustainable solvency means (1) the program is not expected to run out of money any time in the 75-year projection period, and (2) trust fund ratios are expected to finish the 75year projection period on a stable or upward trend.

Sustainable solvency is a stronger standard than actuarial balance in two ways. Actuarial balance is based on averages over time, with-

Table 1: Long-Range Actuarial Balance

(percentage of taxable payroll)

	Summarized Income Rate	Summarized Cost Rate	Actuarial Balance
2009–33	14.96%	15.14%	-0.17%
2009–58	14.24%	15.75%	-1.51%
2009-83	14.02%	16.02%	-2.00%

The summarized income and cost rates are the ratios of the present value of scheduled tax income and cost, respectively, to the present value of taxable payroll, expressed as a percentage.

These calculations include the cost of increasing the trust fund to a target fund at the end of the period equal to one year's outgo.



out regard to year-by-year figures that could indicate inability to pay benefits at some time along the way. And actuarial balance can exist even when trust fund ratios toward the end of the period are trending downward. For example, large and growing actuarial deficits are now projected at the end of the long-range projection period. Adequate financing beyond 2083 would require larger program changes than would actuarial balance.

Unfunded Obligation

The **unfunded obligation** is another way of measuring Social Security's long-term financial commitment. To compute it, we first discount the year-by-year streams of future cost and income at interest, then sum them to get their present values. Based on these present values, the general formula for computing the unfunded obligation is:

Present value of future cost (benefits and expenses) *minus* the present value of future income from taxes *minus* current trust fund assets.

The unfunded obligation may be computed and presented several ways. Perhaps the most useful way is based on taxes and benefits for an open group of participants over the next 75 years, including many people not yet born, the same as in the basic projections. That methodology is consistent with the primarily payas-you-go way the program is designed and is currently run. Although the trustees provide alternative calculations based on the closed group of current participants, we believe the open-group basis makes more sense here and avoids certain misleading and anomalous outcomes. For example, if the program were in exact actuarial balance, the open-group measure of the unfunded obligation would be zero, while the closed-group measure would still show a substantial unfunded obligation.

The dollar amount of unfunded obligation is much easier to interpret if put in perspective, for example, by comparing it with the size of the economy over the same period. Accordingly, the unfunded obligation is often presented as a percentage of either taxable payroll or gross domestic product (GDP). At the beginning of 2009, the open-group unfunded obligation over the next 75 years was \$5.3 trillion. This represents 1.9 percent of taxable payroll, or 0.7 percent of GDP. All these amounts are up substantially from a year ago, when they were \$4.3 trillion, 1.6 percent of taxable payroll, and 0.6 percent of GDP, respectively.

In recent years, the Trustees' Report has also presented the unfunded obligation based on stretching the 75-year projection period into

		Ultimate Value, After 2033		
	Estimated 2008 Value	Low-Cost Assumptions	Intermediate Assumptions	High-Cost Assumptions
Fertility (children per woman)	2.1	2.3	2.0	1.7
Mortality reduction (average annual decrease in adjusted death rates, 2033–83)	0.60%	0.35%	0.77%	1.24%
Annual net immigration (thousands)	1,235	1,370	1,065	785
Productivity growth (total U.S. economy)	1.8%	2.0%	1.7%	1.4%
Real-wage growth	-1.0%	1.7%	1.1%	0.5%

Table 2: Current and Long-Range Values of Key Economic and Demographic Assumptions

infinity. This has certain theoretical advantages, but in practice it's highly problematic. Since 2003, when that methodology came under consideration, we have formally objected to it. Projections over an infinite time period have an extremely high degree of uncertainty. Troublesome anomalies and inconsistencies can arise among demographic assumptions, for example, by assuming that longevity keeps increasing forever while retirement ages remain static. And the public could easily be misled about the program's financial status or could lose respect for the excellent work generally underlying the Trustees' Report. Some may believe that more financial disclosure is always better, but we believe projecting these obligations to infinity is not helpful.

ALTERNATIVE SETS OF ASSUMPTIONS

Table 2 shows the ultimate long-range values of key assumptions used in each of the three projections. Major changes in assumptions from a year ago were:

- Faster mortality reduction, due to declining death rates from heart disease and cancer at ages 65 to 84
- A poor short-range economy, with negative real-wage growth currently

OTHER MEASURES OF UNCERTAINTY

In addition to alternative projections, the trustees use other methods to measure how the financial results may vary with changing economic and demographic experience.

Sensitivity Analysis

The low-cost and high-cost projections change all the major intermediate assumptions at once in the same direction, favorably or unfavorably. The trustees also perform a **sensitivity analysis**, changing the major assumptions one at a time to determine the financial impact. Table 3 gives results of three sensitivity tests. For example, if the real-wage growth assumption were changed from 1.1 percent to 1.7 percent, the actuarial deficit would be reduced from 2.00 percent of taxable payroll to 1.20 percent, and the year of trust fund exhaustion would be extended from 2037 to 2044.

Stochastic Projections

Each of the three alternative projections is "deterministic," that is, the projection model uses the given assumptions to produce a single set of results with no randomness. In contrast, a "stochastic" projection would attach probability measures to a range of results. Since 2003, the trustees have been presenting the results of their first effort to develop such stochastic

	Low-cost Assumptions	Intermediate Assumptions	High-cost Assumptions		
Total Fertility Rate					
Ultimate assumption (children per woman)	2.3	2.0	1.7		
■ 75-year actuarial deficit	1.68%	2.00%	2.35%		
Year trust funds are exhausted	2037	2037	2037		
Mortality Reduction					
Average annual reduction in adjusted death rates, 2008–83	0.33%	0.79%	1.32%		
■ 75-year actuarial deficit	1.34%	2.00%	2.71%		
Year trust funds are exhausted	2039	2037	2035		
Real-wage Growth					
Ultimate assumption (annual rate)	1.7%	1.1%	0.5%		
■ 75-year actuarial deficit	1.20%	2.00%	2.81%		
Year trust funds are exhausted	2044	2037	2033		

Table 3: Sensitivity to Varying Any of Three Key Assumptions

results, labeling them as preliminary and an adjunct to the regular projections. The trustees caution that these results use data from a relatively stable time period, and thus should be viewed as covering the minimum plausible range of future variation without reflecting substantial shifts in experience that may occur. We believe the usefulness of the stochastic analysis for this program is very limited. The state of our knowledge does not allow important unknowns to be turned into probabilities. Moreover, the projection model is only an approximation to the complex real world.

REFERENCES

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American Academy of Actuaries issue briefs on Social Security (www.actuary.org/briefs.asp#soc)

- A Guide to the Use of Stochastic Models in Analyzing Social Security
- Assumptions Used to Project Social Security's Financial Condition
- An Actuarial Perspective on the Social Security Trustees' Report (updated annually)