American Academy of Actuaries
ISSUE BRIEF
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New Report Shows Modest Improvement

Social Security's Financial Soundness Should Be Addressed Now
Disability Fund Still Projected to Be Depleted Next Year

The 2015 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds highlights that:

- The combined Social Security trust funds are projected to deplete during 2034, one year later than projected in last year's report. If changes are not implemented by that date, only about 79 percent of scheduled benefits would be payable, declining to 73 percent in 2089.
- The Disability Insurance (DI) Trust Fund alone is projected to deplete its reserves in the fourth quarter of 2016. At reserve depletion, the trustees project 81 percent of scheduled benefits would be payable, unchanged from last year.
- The present value of the shortfall between assets, which include income and reserves, and obligations, which include scheduled benefit payments, estimated over the 75-year valuation period of the projection increased slightly from $10.6 trillion in 2014 to $10.7 trillion in 2015. The unfunded obligation over the valuation period is 0.9 percent of gross domestic product (GDP) compared to 1.0 percent of GDP in the prior year. The unfunded obligation decreased from 2.73 percent to 2.53 percent of taxable payroll over the same period.
- To bring Social Security into actuarial balance for the next 75 years (using best-estimate assumptions), changes equivalent to either an immediate increase of 2.62 percentage points in the payroll tax rate, or an immediate decrease of 16.4 percent of benefits for all current and future beneficiaries, or some combination thereof, is required. The analogous numbers from last year's report were a 2.83-percentage-point increase in the payroll tax rate and a 17.4 percent decrease in all benefits.

Congress should act soon to improve the long-term financial outlook of Social Security. Congress should act immediately to address the Disability Insurance Trust Fund.

An Actuarial Perspective on the 2015 Social Security Trustees Report

The Social Security Trustees Report is a detailed annual assessment that serves as a basis for discussions of Social Security's financial problems and their solutions. Social Security's chief actuary prepares and certifies the financial projections for the Old-Age, Survivors, and Disability Insurance program, under the direction of the Social Security Board of Trustees.

Because future events are inherently uncertain, the report contains three 75-year financial projections to illustrate a broad range of possible outcomes based on three separate sets of assumptions. These projections are called intermediate, low-cost, and high-cost. The report also provides a sensitivity analysis for key assumptions. The trustees consider the intermediate projection to be their best estimate. **All information in this issue brief is based on the intermediate projection, unless otherwise noted.**

OVERVIEW OF FINANCIAL STATUS

Short-Range Estimates, 2015–2024

Short-range solvency and financial adequacy are measured separately for Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI) programs, as well as for the combined (OASDI) trust funds. These measures are based on the funds' projected trust fund ratios. A trust fund ratio is the

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ratio of the trust fund assets at the beginning of the year to the benefits payable during the year. The plans are considered solvent during any period if the trust fund ratios are positive throughout the period. For the plans to pass the test of short-range financial adequacy, a further requirement is that the trust fund ratios remain at or above 100 percent throughout the 10-year short-range period.[1] The DI trust fund ratio is projected to drop quickly from 40 percent today to **zero** during 2016. The OASI trust fund ratio is expected to drop from 362 percent to 216 percent by the end of the 10-year period. *Under the trustees' projections, action by Congress is needed to allow the DI trust fund to continue to pay full scheduled disability benefits during and beyond 2016.*

Social Security's OASI finances (excluding disability) are somewhat better than the projection made a year ago. The total change in the projected 10th-year trust fund ratio was a decline of 16 percentage points. Moving the Short-Range Estimate period one year forward accounted for most of the change. Other changes, with the impact on the 10th-year trust fund ratio in parentheses, include:

- Moving the Short-Range Estimate period forward one year (reduced ratio by 18 percentage points)
- Changes in economic data and assumptions (reduced ratio by 5 percentage points)
- Changes in demographic data and assumptions (increased ratio by 4 percentage points)
- Changes in legislation and regulations (increased ratio by 2 percentage points)

Unless otherwise noted, all subsequent information in this issue brief is based on the combined OASDI trust funds.

Trust Fund Asset Reserves

Any excess of tax income over outgo is recorded as an asset reserve of the Social Security trust funds. These trust fund asset reserves are held in special U.S. Treasury securities that totaled almost $2.8 trillion at the end of 2014. Trust fund asset reserves are expected to increase to almost $2.9 trillion by 2019 and then decline slightly by the end of the short-range estimate period. The bonds in the trust funds represent the government's commitment to repay the borrowed funds whenever Social Security needs the money.

Income and Cost

Figure 1 shows the excess of income (excluding interest) over cost (referred to as a positive cash flow) in the period from 1976 through 2009, and the anticipated excess of cost over income through 2024. The excess of income over cost prior to 2009 has led to the current $2.8 trillion in trust fund asset reserves.

The net annual amounts of income (excluding interest) to, and outgo from, Social Security are expressed in the Trustees Report as percentages of taxable payroll. These percentages are known respectively as the **income rate** and **cost rate**. During the short-range estimate period of 2015–2024, the income rate will increase (due to taxation of Social Security benefits) from 12.80 percent to 13.06 percent of annual taxable payroll. The cost rate, meanwhile, will rise from 13.99 percent to 14.96 percent of taxable payroll. The difference between these two rates, called the **annual balance**, ranges from a deficit of 1.19 percent to a deficit of 1.90 percent[2] of taxable payroll during the period from 2015 to 2024.

Long-Range Estimates, 2015–2089

Long-range estimates are based on a 75-year projection that covers the future lifetimes of nearly all current participants, which includes those paying payroll taxes and those already retired. The estimates show that, beginning in 2034, trust fund asset reserves are projected to be depleted and the system is expected to revert to a pay-as-you-go (PAYGO) system. This date is one year later than shown in last year's report. After 2034, under current law, Social Security income will be sufficient to pay only 73 percent to 79 percent of scheduled benefits, as shown in Figure 2.

[1]This condition applies when the trust fund ratio is at least 100 percent at the beginning of the period. If the trust fund ratio is below 100 percent at the beginning of the period, the test of short-term financial adequacy requires that the trust fund ratio increase to 100 percent within five years (while remaining positive at all times) and then remain at or above 100 percent for the rest of the short-range period.

[2]Table IV.B1, 2014 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds. Please note that due to rounding, numbers may not add up.

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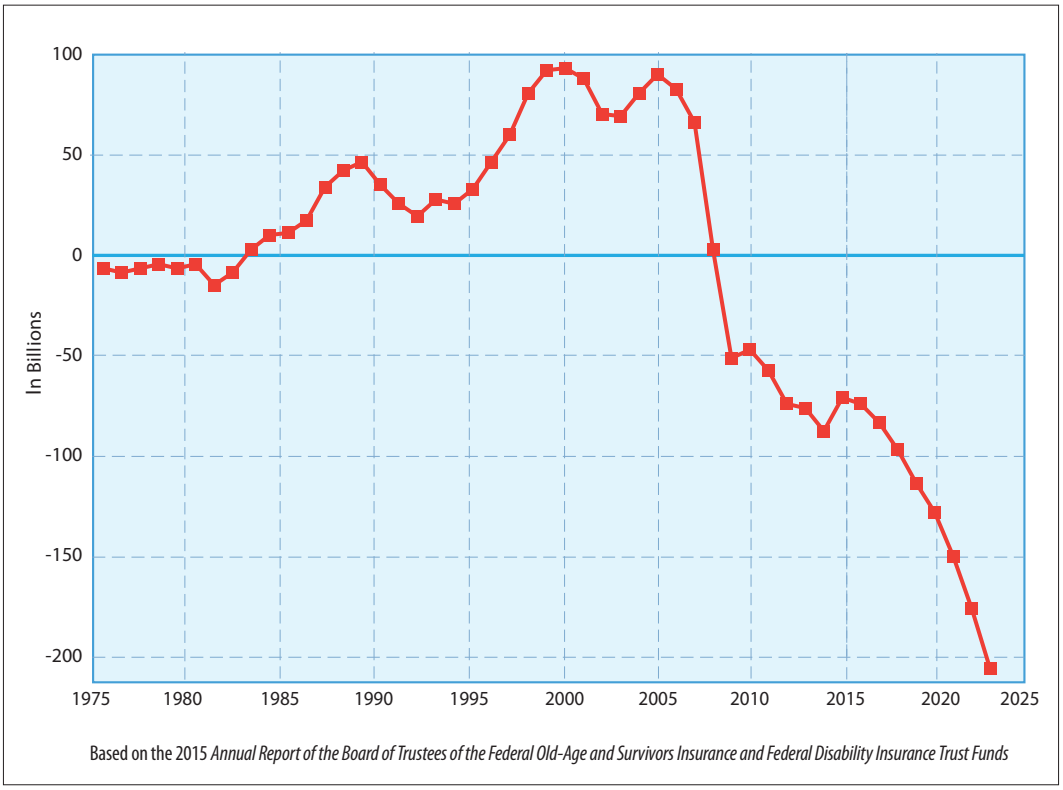
Figure 1: OASDI Cash Flow Excluding Interest on Assets

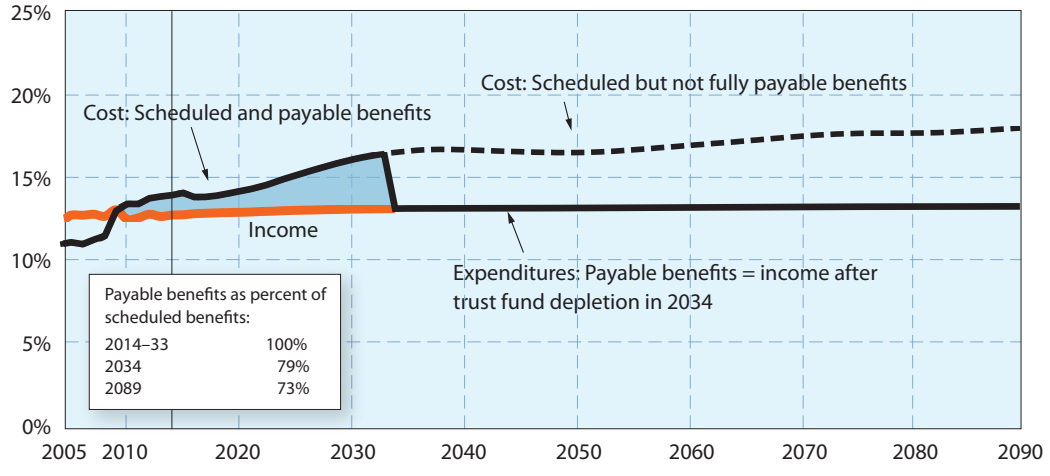


Based on the 2015 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*

The projections show expenditures exceeding non-interest income in every year (as has been the case since 2010) and rising rapidly through 2035 as the baby boomers retire. While costs are expected to increase quickly, tax revenue is also expected to grow, but more slowly. After 2035, projected costs are fairly level as a share of both GDP and taxable payroll increasing somewhat later in the 75-year projection.

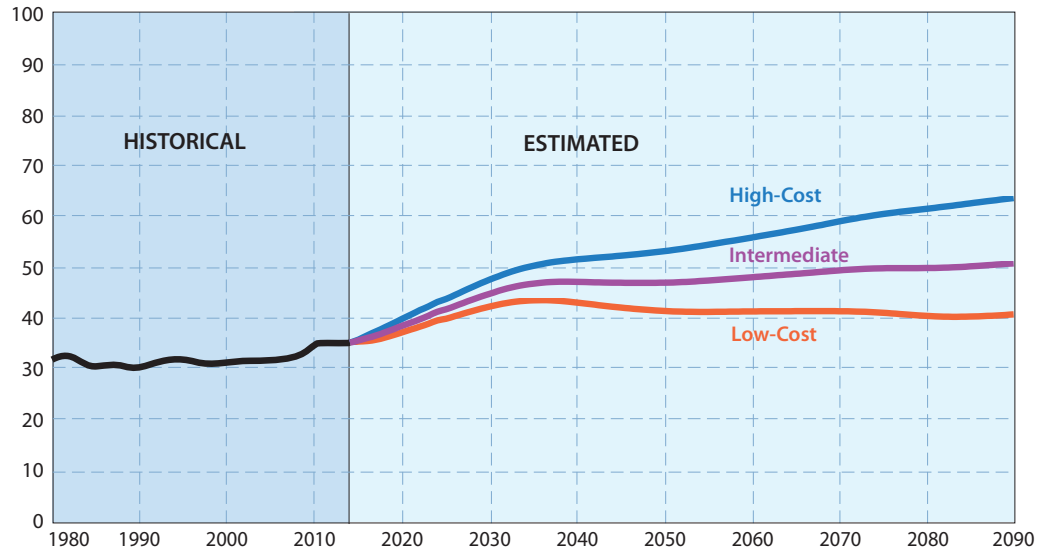
Actuarial balance conveys the long-range solvency of Social Security in one number. Actuarial balance is the discounted present value of all future income less all future costs, divided by the discounted present value of the taxable payroll over the 75-year period. It represents the annual amount (expressed as a percent of taxable

Figure 2: Projected Annual Cost and Tax Income as a Percentage of Taxable Payroll



Based on the 2015 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*

Figure 3: Number of Social Security Beneficiaries Per 100 Workers



Based on the 2015 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*

payroll) by which income would need to increase to have Trust Fund assets equal to one year of scheduled benefits at the end of the 75-year projection period. The actuarial balance improved, from a negative 2.88 percent to a negative 2.68 percent during 2014. Refer to the Appendix for a more expanded definition of actuarial balance.

The chief actuary's Statement of Actuarial Opinion (SAO) was significantly expanded in the 2014 Trustees Report. The 2015 SAO addresses trust fund accounting versus unified budget accounting that should be of interest to all who desire a deeper understanding of those important budget conventions.

NOW IS THE TIME TO RESTORE SOCIAL SECURITY'S LONG-TERM FINANCIAL SOUNDNESS

To forestall the depletion of the Social Security Disability Insurance Trust Fund, action must be taken soon to continue to pay scheduled benefits through 2016 and beyond. In addition, the sooner a solution is implemented to ensure the sustainable solvency of Social Security, the less disruptive the required solution will need to be.

The long-range expected increase in Social Security program costs are principally caused by demographic trends. These demographic trends are very well-known and are generally referred to as "aging" or, sometimes, as "the aging of America." It is useful to further separate the aging trend into two components:

(i) macro-aging, which is observed at the population level and refers to a shift in the average age of the population caused by the large one-time decrease in birth rates beginning in the mid-1960s (the fertility drop after the large Baby Boom generation), and

(ii) micro-aging, which can be observed at an individual level and refers to the expected continuous long-term increase in life expectancies, caused by individuals living longer, on average, in each succeeding generation.

A third demographic component, which acts to offset macro-aging, is immigration. Because immigrants tend to be young, higher immigration can offset some of the increase in the average age of the population caused by lower birth rates.

The ratio of workers to Social Security beneficiaries is expected to fall rapidly from 2.8 in 2014 to 2.1 in 2035, primarily due to macro-aging, and then to decrease more slowly, primarily due to micro-aging, to 2.0, by the end of the 75-year projection period. This decrease over the projection period of approximately 30 percent is important in a PAYGO system in which, over time, the number of workers multiplied by the average per-person tax must equal the number of beneficiaries multiplied by the average benefit. In other words,

the dollars paid into the system must equal the dollars paid out in a PAYGO system.

Figure 3 shows the projected growth in the number of Social Security beneficiaries relative to the working population, under the three sets of assumptions. Because the program financing is nearly PAYGO, the three alternative projections of long-range cost show similar patterns.

The American Academy of Actuaries' Social Security Committee believes that any modifications to the Social Security system should include **sustainable solvency** as a primary goal. Sustainable solvency means that not only will the program be solvent for the next 75 years under the reform methods adopted, but also that the trust fund reserves at the end of the 75-year period will be stable or increasing as a percentage of annual program cost. Refer to the appendix for a more complete explanation of sustainable solvency.

Providing for solvency beyond the next 75 years will require changes to address micro-aging, as beneficiaries will likely be receiving benefits for ever-longer periods of retirement.

Regardless of the types of changes ultimately enacted into law, measures to address Social Security's financial condition will best serve the public if implemented sooner rather than later. Some advantages of acting promptly are:

- Future beneficiaries gain time to plan for all aspects of retirement and modify their own financial planning, while adjusting to legislated changes in Social Security.
- Implementation of program changes can be more gradual and span multiple generations of retirees.
- Public trust in the financial soundness of the Social Security program will improve.

Providing for solvency of Social Security both during and after the period where the macro-aging trend impacts Social Security requires a timely and thoughtful solution. Not only should changes address the Baby Boom bulge, they should continue to address micro-aging trends and provide for solutions beyond the 2030s.

The imminent rapid decline of the Social Security disability trust fund in 2016 must be addressed promptly, and overall Social Security program solvency should be considered in terms of the stricter requirements of sustainable solvency.

APPENDIX

OTHER MEASURES OF FINANCIAL STATUS

The metrics used by the trustees to present the program's financial status are discussed in more detail below.

Actuarial Balance

Actuarial balance is calculated as the difference between the summarized income rate and the summarized cost rate over a period of years. The summarized income rate is the ratio of any existing trust fund plus the sum of the present value of scheduled tax income for each year of the period to the sum of the present value of taxable payroll for each year of the period. The summarized cost rate is the ratio of the sum of the present value of cost for each year of the period, including one year's outgo at the end of the period, to the sum of the present value of taxable payroll for each year of the period. Table 1 shows the components of actuarial balance.

In the 75-year period, 2015–2089, the actuarial deficit is 2.68 percentage points. The actuarial deficit decreased from the comparable figure of 2.88 percentage points a year ago due to a combination

Table 1: Long-Range Actuarial Balance

(percentage of taxable payroll)

Period	Summarized Income Rate	Summarized Cost Rate	Actuarial Balance (percentage points)*
25-year (2015-39)	14.67%	16.06%	-1.39
50-year (2015-64)	14.04%	16.26%	-2.23
75-year (2015-89)	13.86%	16.55%	-2.68

Based on the 2015 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*

* The results shown in the Actuarial Balance column may not be equal to the difference between Summarized Income Rate and Summarized Cost Rate because of rounding.

of factors, including changes in demographic data and assumptions, changes in economic data and assumptions and, legislative and policy changes.

An immediate increase of 2.62 percentage points in the payroll tax (from 12.4 percent of payroll to 15.02 percent of payroll), a benefit reduction of 16.4 percent, or some combination of the two, would pay all benefits during the period, but would not end the period with any trust fund reserve.

The high-cost 75-year projection in the Trustees Report shows a far greater actuarial deficit—6.31 percent of taxable payroll. The low-cost projection is much more favorable, with a small positive actuarial balance for the 75-year period.

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 the expected scheduled benefits and expenses for the next year without any additional income. Figure 4 shows projected trust fund ratios under all three sets of assumptions.

As a measure of long-range solvency, the trust fund ratio shows when the program is expected to run out of money to pay full benefits scheduled under current law. Figure 4 illustrates that trust fund depletion occurs in 2034 under the intermediate projection. The high-cost projection moves the trust fund depletion date up by approximately five years to 2028, while the low-cost projection shows no trust fund depletion during the 75-year period.

Sustainable Solvency

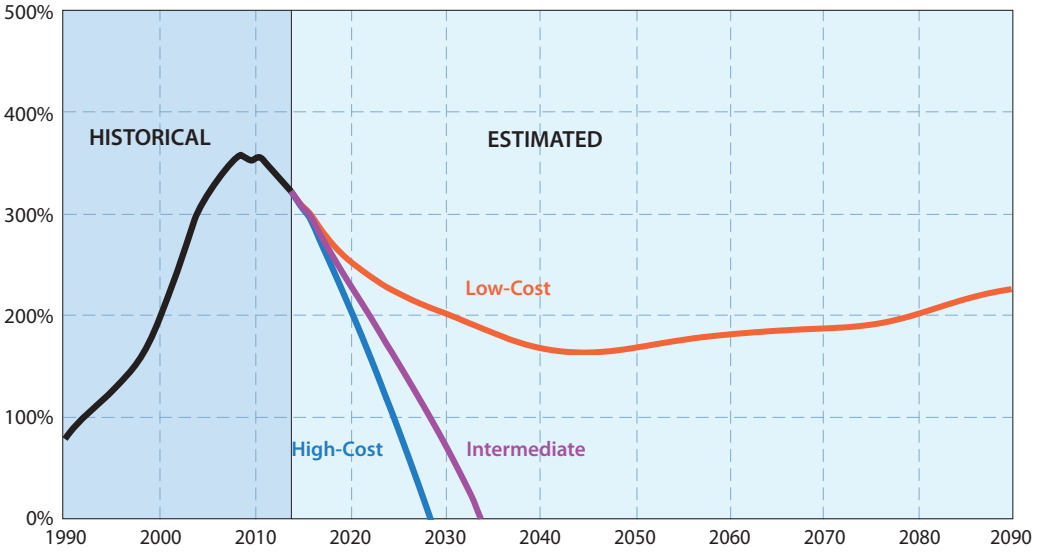
Sustainable solvency means the program is not expected to run out of money any time in the 75-year projection period, and trust fund ratios are expected to finish the 75-year projection period on a stable or upward trend.

Sustainable solvency is a stronger standard than actuarial balance in two ways. First, actuarial balance is based on averages over time, without regard to year-by-year figures that could indicate inability to pay benefits from trust fund assets at some point along the way. Second, actuarial balance can exist even when trust fund ratios toward the end of the period are trending sharply downward.

Sustainable solvency, in contrast, requires strict year-by-year solvency AND trust fund ratios that are level or trending upward toward the end of the period. For example, following the last major Social Security reform, the 1983 Trustees Report projected a positive actuarial balance under the intermediate assumptions, but the annual balances were negative and declining at the end of the 75-year period. That report was in actuarial balance but did not show sustainable solvency. As a result, the actuarial balance generally has been declining since then, primarily as a consequence of the passage of time. It is important to note that

Figure 4: Long-Range Projections of Trust Fund Ratios Under Alternative Scenarios

(assets as a percentage of annual cost)



Based on the 2015 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*

this result was exactly what experts expected in 1983. More than 30 years later, it should be no surprise that large and growing actuarial deficits are now projected at the end of the long-range projection period. Adequate financing beyond 2089, or sustainable solvency, would require larger program changes than needed to achieve actuarial balance.

Unfunded Obligation

The **unfunded obligation** is another way of measuring Social Security's long-term financial commitment. To compute it, discount with interest the year-by-year streams of future cost and income and then sum them to obtain 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 in 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 was calculated in the basic projections. That methodology is consistent with the primarily pay-as-you-go way the program is designed and 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 for Social Security and avoids certain misleading 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 show a substantial unfunded obligation.

The dollar amount of unfunded obligation is easier to interpret if put in perspective, for example, by comparing it with the size of the economy over the same period. The unfunded obligation is often presented as a percentage of the present value of either taxable payroll or of gross domestic product (GDP). At the beginning of 2015, the open-group unfunded obligation over the next 75 years was $10.7 trillion (up from $10.6 trillion last year). This now represents 2.53 (2.73 last year) percent of taxable payroll, or 0.9 percent (1.0 last year) of GDP.

In recent years, the trustees' reports have also presented the unfunded obligation based on stretching the 75-year projection period into infinity. This measure gives information about trends in effect at the end of the 75-year period of the forecast, but, in practice, it is highly problematic. Projections over an infinite time period have an extremely high degree of uncertainty. Troublesome inconsistencies can arise among demographic and program-specific assumptions. By assuming that longevity keeps increasing forever while retirement ages remain static, for example, the infinite time period forecast will eventually result in an extremely long period of retirement.

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

	Average of Estimated and Historical Values*	Estimated 2014 Value	Ultimate Value		
			Low-Cost Assumptions	Intermediate Assumptions	High-Cost Assumptions
Fertility (children per woman)	2.0	1.9	2.2	2.0	1.8
Mortality reduction (assumed average annual decrease in adjusted death rates)	1.38%	1.38%	0.41%	0.78%	1.18%
Annual net immigration (thousands)	1,031	1,150	1,365	1,080	820
Productivity growth (total U.S. economy)	1.17%	0.56%	1.98%	1.68%	1.38%
Real-wage growth	0.23%	1.75%	1.80%	1.17%	0.55%

Based on the 2015 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds
* 10-year average, except productivity growth and real-wage growth, which are measured from 2007.

MEASURES OF UNCERTAINTY

Because the future is unknown, the trustees use alternative projections and other methods to assess how the financial results may vary with changing economic and demographic experience.

Alternative Sets of Assumptions

Table 2 shows a comparison between recent values and ultimate long-range values of five key assumptions used in each of the three projections. With the exception of productivity growth, where the ultimate values have not changed from last year's report, the ultimate values of the other assumptions exhibit some minor changes when compared to last year's report.

Sensitivity Analysis

The low-cost and high-cost projections change all the major intermediate assumptions at once in the same direction, either favorably or unfavorably. In contrast, there might be some interest in how the projections change when only one key assumption is changed at a time, either favorably or unfavorably. A sensitivity analysis shows exactly this. Just one assumption is changed at a time to determine the financial impact. Table 3 gives results of three sensitivity tests focusing on total fertility rate, mortality reduction, and real-wage growth.

If the real-wage growth assumption were changed from 1.17 percent to 1.80 percent, for example, the actuarial deficit would be reduced from 2.68 percent of taxable payroll to 1.68 percent, and the year of trust fund asset reserve depletion would be extended from 2034 to 2038.

Table 3: Sensitivity to Varying Any of Three Key Assumptions

Sensitivity Assumption		Results based on Intermediate Assumptions, with one assumption changed at a time	
	Favorable Change	Intermediate Assumption	Unfavorable Change
Total Fertility Rate			
■ Ultimate total fertility rate	2.2	2.0	1.8
■ 75-year actuarial deficit	2.34%	2.68%	3.01%
■ Year of combined trust fund reserve depletion	2034	2034	2034
Mortality Reduction			
■ Average annual reduction (in adjusted death rates over 75-year period)	0.41%	0.78%	1.18%
■ 75-year actuarial deficit	2.23%	2.68%	3.14%
■ Year of combined trust fund exhaustion	2034	2034	2033
Real-wage Growth			
■ Ultimate percentage increase in wages in excess of CPI	1.80%	1.17%	0.55%
■ 75-year actuarial deficit	1.68%	2.68%	3.69%
■ Year of combined trust fund reserve depletion	2038	2034	2032

Based on the 2015 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*

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