

THE FUTURE FINANCIAL STATUS OF THE SOCIAL SECURITY PROGRAM

by Stephen C. Goss*

The concepts of solvency, sustainability, and budget impact are common in discussions of Social Security, but are not well understood. Currently, the Social Security Board of Trustees projects program cost to rise by 2035 so that taxes will be enough to pay for only 75 percent of scheduled benefits. This increase in cost results from population aging, not because we are living longer, but because birth rates dropped from three to two children per woman. Importantly, this shortfall is basically stable after 2035; adjustments to taxes or benefits that offset the effects of the lower birth rate may restore solvency for the Social Security program on a sustainable basis for the foreseeable future. Finally, as Treasury debt securities (trust fund assets) are redeemed in the future, they will just be replaced with public debt. If trust fund assets are exhausted without reform, benefits will necessarily be lowered with no effect on budget deficits.

Introduction

As a result of changes to Social Security enacted in 1983, benefits are now expected to be payable in full on a timely basis until 2037, when the trust fund reserves are projected to become exhausted.¹ At the point where the reserves are used up, continuing taxes are expected to be enough to pay 76 percent of scheduled benefits. Thus, the Congress will need to make changes to the scheduled benefits and revenue sources for the program in the future. The Social Security Board of Trustees project that changes equivalent to an immediate reduction in benefits of about 13 percent, or an immediate increase in the combined payroll tax rate from 12.4 percent to 14.4 percent, or some combination of these changes, would be sufficient to allow full payment of the scheduled benefits for the next 75 years.

Since the inception of the Social Security program in 1935, scheduled benefits have always been paid on a timely basis through a series of modifications in the law that will continue. Social Security provides a basic level of monthly income to workers and their families after the workers have reached old age, become disabled, or died. The program now provides benefits to over 50 million people and is financed with the

payroll taxes from over 150 million workers and their employers. Further modifications of the program are a certainty as the Congress continues to evolve and shape this program, reflecting the desires of each new generation.

This article describes the financial status of the Social Security program, including an analysis of the concepts of solvency and sustainability and the relationship of Social Security to the overall federal unified budget. The future is uncertain in many respects, and based on new information, projections of the financial status of the Social Security program vary somewhat over time. What is virtually certain

Selected Abbreviations

DI	Disability Insurance
GDP	gross domestic product
HI	Hospital Insurance
NRA	normal retirement age
OASDI	Old-Age, Survivors, and Disability Insurance
OASI	Old-Age and Survivors Insurance
PAYGO	pay as you go

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is that the benefits that almost all Americans become entitled to and most depend on will be continued into the future with modifications deemed appropriate by their elected representatives in the Congress.

Annual Reports by the Trustees

Each year, starting in 1941, the Social Security Board of Trustees has presented a required report on the financial status of the program to the Congress. The board has six members, including the Secretary of the Treasury as the managing trustee, the Secretary of Labor, the Secretary of Health and Human Services, and the Commissioner of Social Security, plus two public trustees appointed by the president and confirmed by the senate.

The Social Security Act requires that the annual report include (1) the financial operations of the trust funds in the most recent past year, (2) the expected financial operations of the trust funds over the next 5 years, and (3) an analysis of the actuarial status of the program. The recent financial operations and the operations projected for the next few years are a finger on the pulse of the program. The actuarial status of the program is intended to provide an early warning of any potential longer-term financial issues or challenges that will be facing the program.

The longer-term analysis of the actuarial status of the Social Security trust funds provides the Congress with an essential early warning of future challenges and provides the time to make desired changes in a careful and thoughtful manner. Although legislative changes may sometimes appear to be decided at the last minute before a crisis, the long advance warning of financial challenges provided by the trustees in the annual reports has always promoted broad consideration of options for change that allow any eventual modification of the law to be based on sound analysis and consideration of a comprehensive view of possible changes and their effects.

Since the last major amendments to the Social Security program were enacted in 1983, the annual reports have presented a succession of developments in the actual experience of the economy and the program benefits that show a need for more change to address the future challenges we face. The *1983 Trustees Report* indicated that the Social Security program was put into “actuarial balance” for the 75-year, long-range projection period. This meant that under the intermediate assumptions used in that report, representing the trustees’ best estimate of future experience at that time, program financing was expected to be sufficient

to pay scheduled benefits in full through 2057.² However, that report also indicated that well before 2057, program cost would rise above the annual tax income to the program, requiring redemption of trust fund reserves to pay full benefits. The report also showed that these reserves would be approaching exhaustion in 2057, so that full scheduled benefits would not be payable starting shortly thereafter, without further change to the program. Thus, even at the enactment of the 1983 Amendments to the Social Security Act, it was known that further changes would be needed. The continuing projections in the annual reports since 1983 have borne out this projection and have resulted in extensive consideration of options.

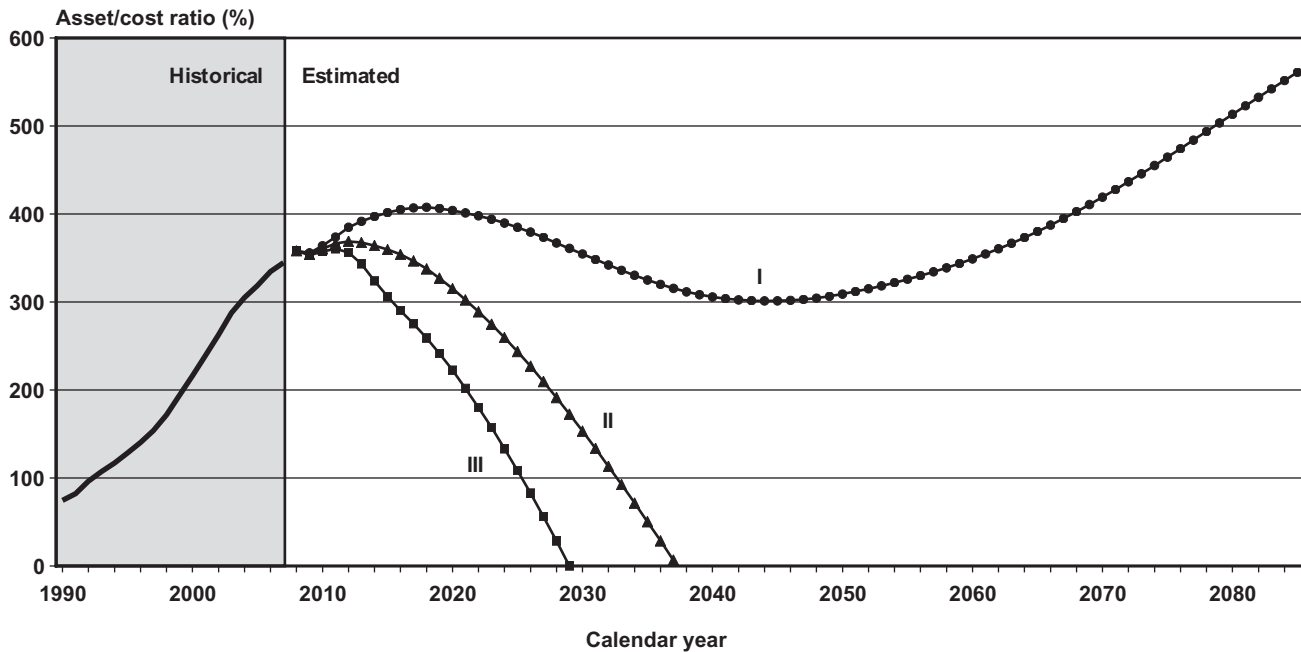
Solvency of the Social Security Program

When individuals look at the financial status of the Social Security program, they often ask, “Will I get my benefits?” Assuming no future change in the law, this question can be answered directly by focusing on the “solvency” of the Social Security trust funds. Solvency for the Social Security program is defined as the ability of the trust funds at any point in time to pay the full scheduled benefits in the law on a timely basis.

The two Social Security trust funds, those for Old-Age and Survivors Insurance (OASI) benefits and for Disability Insurance (DI) benefits, are special. Along with the Hospital Insurance (HI) Trust Fund of the Medicare program, the OASI and DI Trust Funds have the important feature that benefits can only be paid to the extent that the trust funds actually have assets to draw on to pay the benefits. Unlike the rest of federal government operations, these three trust fund programs do not have the ability to borrow in order to continue paying benefits when the dedicated taxes and trust fund reserves are not sufficient.³

Because the ability of these programs to pay benefits is directly dependent on the availability of assets in their respective trust funds, the existence of assets over time in the future is the critical indicator of solvency. Taken from the *2009 Trustees Report*, Chart 1 shows that under the trustees’ intermediate assumptions (alternative II), the combined assets of the OASI and DI Trust Funds will soon peak at over 350 percent of the annual cost of the program, but will then decline, reaching exhaustion in 2037. The relatively more optimistic assumptions of the low-cost alternative I show solvency for the program throughout the 75-year projection period, while the relatively pessimistic high-cost alternative III assumptions show trust fund exhaustion even sooner than 2037. These

Chart 1.
Combined OASI and DI Trust Fund assets as a percentage of program cost, 1990–2008, projected under alternative assumptions, 2009–2085



SOURCE: 2009 Social Security Trustees Report, Figure II.D6 and Table IV.B3.

NOTES: Alternative I = low-cost assumptions; alternative II = intermediate assumptions; alternative III = high-cost assumptions.

alternative sets of assumptions are just one of several ways the trustees illustrate the uncertainty of long-range projections for the future.

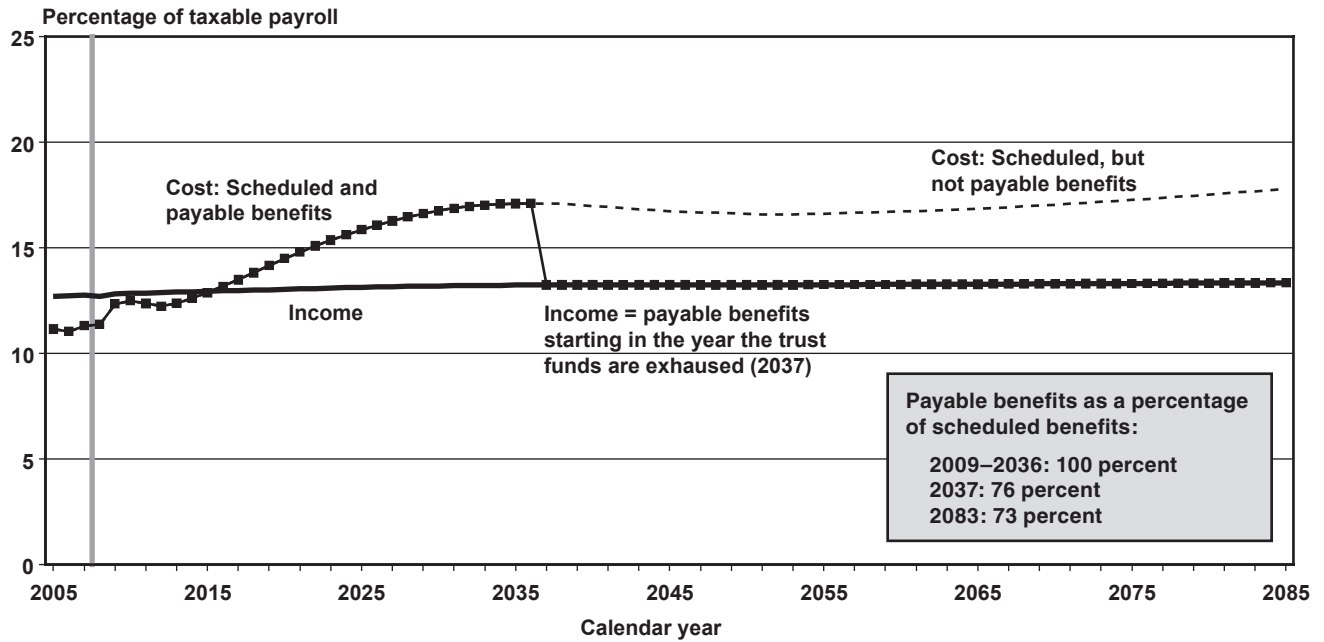
Exhaustion of trust fund assets is projected to occur under the intermediate assumptions because program cost will begin to exceed the tax revenues dedicated to the trust funds in the future, requiring increasing amounts of net redemptions from the trust funds. The assumptions adopted for the 2009 Trustees Report resulted in projected “cash flow” shortfalls for the Old-Age, Survivors, and Disability Insurance (OASDI: OASI and DI combined) program as a whole starting in 2016, when tax revenue alone was first expected to be insufficient to cover the annual cost of the program.⁴ Chart 2, taken from the 2009 Trustees Report, illustrates the nature of this relationship between dedicated tax income for the OASDI program and the projected cost of providing scheduled benefits.

Because the combined OASI and DI Trust Funds have accumulated assets of over \$2.5 trillion, the excess of program cost over current tax income will be covered by net redemption of these assets in the coming years. It is only when the reserves in the trust funds are exhausted that timely payment of full scheduled benefits becomes an issue. As shown in the

chart, at the time of projected trust fund exhaustion in 2037, continuing tax revenue is expected to be sufficient to cover 76 percent of the currently scheduled benefits. This precipitous drop in the level of benefits that would be payable in the absence of any legislative action between now and 2037 is the principal and most significant early warning provided in the 2009 Trustees Report.

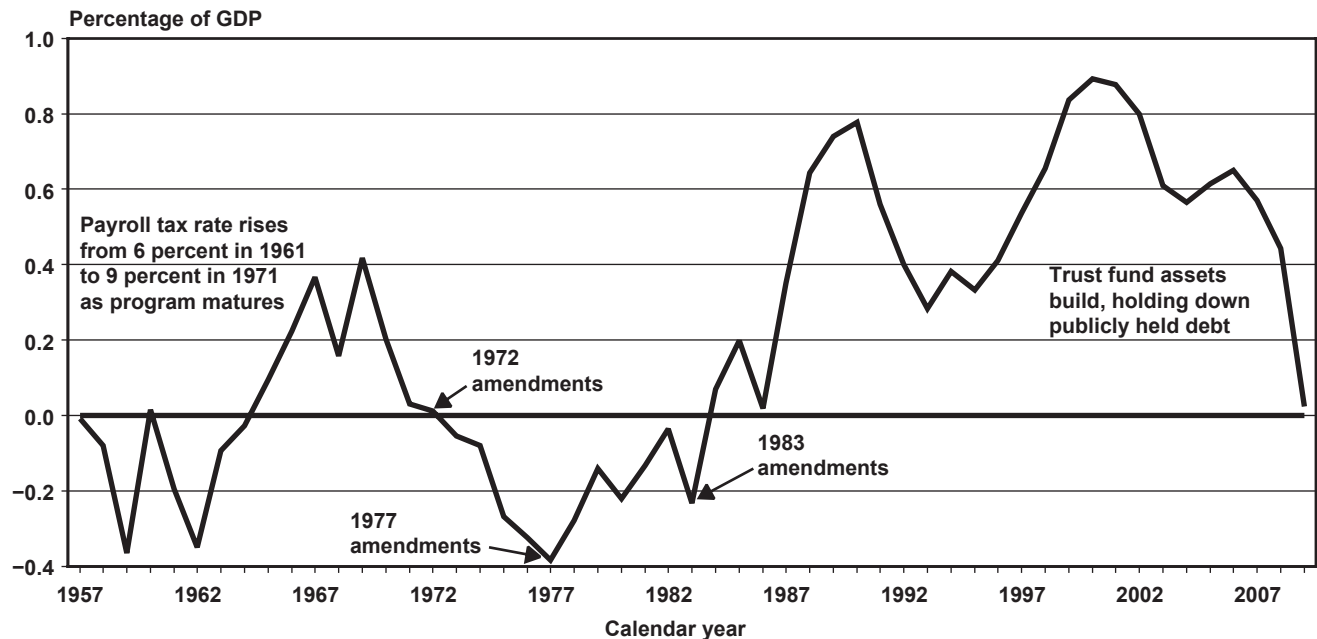
Historically, the OASI and DI Trust Funds have reached times where dedicated tax revenue fell short of the cost of providing benefits and also times where the trust funds have reached the brink of exhaustion of assets. For years 1973 through 1983, the combined OASI and DI Trust Funds were operating with a negative cash flow that was depleting the trust fund reserves toward exhaustion (see Chart 3). The Social Security Amendments of 1977 and 1983 made substantial modifications to the program that reversed the cash flow of the program to positive levels and caused the substantial buildup of assets to the \$2.5 trillion that exists today. The 1977 amendments included a fundamental change in the indexation of benefits from one generation to the next. The 1983 amendments included increases in the normal retirement age (NRA) from 65 to 67 and the introduction of income taxation of

Chart 2.
OASDI program cost and noninterest income as percentages of taxable payroll, 2005–2008, projected under the intermediate assumptions, 2009–2085



SOURCE: 2009 Social Security Trustees Report, Figure II.D2 and Table IV.B1.

Chart 3.
OASDI net cash flows as a percentage of gross domestic product (GDP), 1957–2009



SOURCE: Social Security Administration, Office of the Chief Actuary.

Social Security benefits with revenue credited to the trust funds.

However, the occurrence of a negative cash flow, when tax revenue alone is insufficient to pay full scheduled benefits, does not necessarily mean that the trust funds are moving toward exhaustion. In fact, in a perfectly pay-as-you-go (PAYGO) financing approach, with the assets in the trust fund maintained consistently at the level of a “contingency reserve” targeted at one year’s cost for the program, the program might well be in a position of having negative cash flow on a permanent basis. This would occur when the interest rate on the trust fund assets is greater than the rate of growth in program cost. In this case, interest on the trust fund assets would be more than enough to grow the assets as fast as program cost, leaving some of the interest available to augment current tax revenue to meet current cost. Under the trustees’ current intermediate assumptions, the long-term average real interest rate is assumed at 2.9 percent, and real growth of OASDI program cost (growth in excess of price inflation) is projected to average about 1.6 percent from 2030 to 2080. Thus, if program modifications are made to maintain a consistent level of trust fund assets in the future, interest on those assets would generally augment current tax income in the payment of scheduled benefits.

A cash flow shortfall, therefore, is only a problem if it is large and persistent enough to cause the trust fund reserves to decline over time toward exhaustion. It is for this reason that past major reforms of the Social Security program, specifically those in 1977 and 1983, occurred as the trust fund asset levels were approaching exhaustion. In fact, by the time of the enactment of the 1983 amendments, the OASI Trust Fund had reached the point where it would have been unable to fully meet benefit payments. Special legislation was enacted to provide temporary borrowing authority by the OASI fund from the DI and HI Trust Funds to assure continued payment of benefits by all programs while the Congress developed and enacted the 1983 amendments.

The 1983 Amendments to the Social Security Act reinforced the importance of advance planning for the program. Many have observed that because the trustees produce long-range projections each year and convey these projections to the Congress and the American people, the financing shortfalls facing the OASDI program are small in comparison with many other countries. All policymakers agree that this substantial advance warning is important for adequate

understanding of the actuarial status and for development of the most appropriate solution to meet the needs and desires of the American people.

With the advance warning afforded by the trustees’ presentation of the actuarial status of the trust funds, we have the opportunity to enact legislation with changes in the program’s scheduled revenues and benefits that need not actually take effect for many years in the future. This approach allows those who will be affected by the changes to have substantial advance warning, allowing them to plan for the changes ahead. It also allows changes to be phased in on a gradual basis so that there will not be sharp breaks in the benefit or tax levels faced by succeeding generations in the future. A prime example of this approach was the increase in the NRA—the age at which retirement benefits may be started with no reduction for early retirement—from 65 to 67, enacted in the 1983 Amendments to the Social Security Act. This change only began to be phased in for individuals reaching age 62 in 2000, 17 years after enactment. The full increase of the NRA to age 67 will not be complete until 2022.

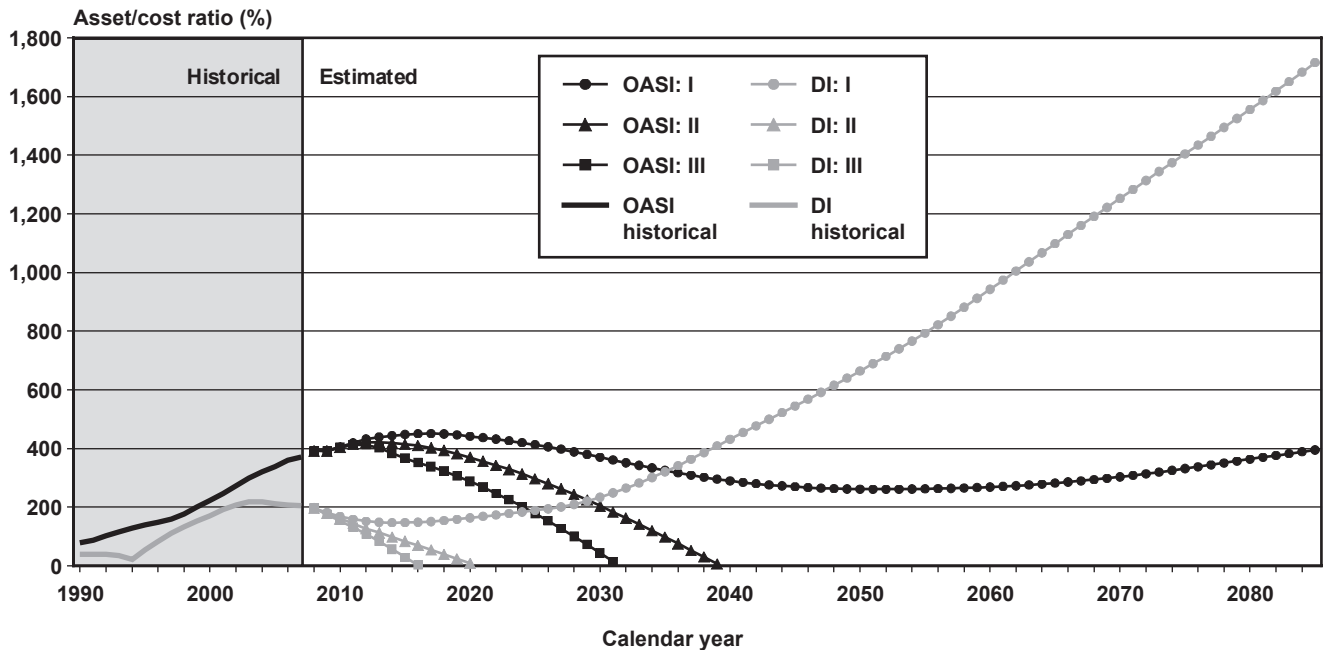
OASI and DI Trust Funds Separately

Although the financial status of the Social Security program is most often considered on a combined basis, as though there were just one trust fund, there are in fact two separate trust funds—one for the OASI program and the other for the DI program. Old-age benefits were enacted in 1935 and started to be paid on a monthly basis in 1940. Benefits for disabled workers below the NRA were not enacted into law until 1956. A separate trust fund has been maintained for the DI program ever since that time, in part in recognition of the special nature of disability and a desire to maintain separate focus on the financing of these benefits.

Currently, the DI program is projected to have a less favorable actuarial status than the OASI program. DI Trust Fund exhaustion is projected for 2020 under the trustees’ intermediate assumptions in the *2009 Trustees Report*. Trust fund exhaustion is projected for 2038 for the OASI fund separately. The proximity of the trust fund exhaustion for the DI program requires special attention. Since 1983, DI program cost has risen above expectations to a much greater degree than has OASI program cost. This is not very surprising, as the benefits under the OASI program are far more predictable than those under the DI program.

Taken from the *2009 Trustees Report*, Chart 4 illustrates the different projections for the OASI and DI Trust Funds. In addition to the much sooner projected

Chart 4.
OASI and DI Trust Fund assets as a percentage of program costs, 1990–2008, projected under alternative assumptions, 2009–2085



SOURCE: 2009 Social Security Trustees Report, Figure IV.B3 and Table IV.B3.

NOTES: Alternative I = low-cost assumptions; alternative II = intermediate assumptions; alternative III = high-cost assumptions.

trust fund exhaustion for the DI program under the intermediate alternative II assumptions, the chart shows the even greater uncertainty around DI cost and actuarial status than for the OASI program.⁵

In 1994, the Congress acted to reallocate a portion of the combined OASDI payroll tax rate from the OASI program to the DI program, in order to avert near-term trust fund exhaustion for the DI program. Then, as now, the OASI program had more favorable actuarial status. Given the possibility that comprehensive reform for the OASDI program might not be completed by 2020, a small reallocation of 0.1 percent to 0.2 percent of the existing 12.4 percent tax rate to the DI fund would again be possible to more nearly equalize the financial status of the OASI and DI Trust Funds. It is for this reason, and because of the simplicity of considering the OASDI program on a unified basis, that most analysis of the actuarial status of the Social Security program is done on a theoretical basis where the two trust funds are considered on a combined basis.

Sustainability of Social Security

The concept of sustainability for the Social Security program has come to have two separate meanings. The first considers only the simple question of whether

currently scheduled dedicated tax revenue is sufficient to adequately finance currently scheduled benefits in the law, without any modification to the law. The second considers whether the current structure of the program, with a defined benefit reflecting career-average earnings levels and a flat payroll tax up to a specified earnings level, is viable for the future.

The first, simpler concept of financial sustainability under current law is relatively easy to evaluate. As illustrated by the projections under the trustees' intermediate assumptions, modifications of benefits or tax revenue in the future will almost certainly be needed to avoid trust fund exhaustion. In the relatively near term, by 2020, the specific needs of the DI Trust Fund must be addressed. By 2037, the overall projected shortfall of scheduled financing must also be addressed. As indicated in the *2009 Trustees Report*, the 75-year shortfall projected under intermediate assumptions for the OASDI program could be met with benefit reductions equivalent in value to a 13 percent immediate reduction in all benefits, an increase in revenue equivalent to an immediate increase in the combined (employee and employer) payroll tax rate from 12.4 percent to 14.4 percent, or a combination of these two approaches.

The second concept, the sustainability of the current structure of benefits and financing of the OASDI program, is not an issue directly addressed in the trustees report. This consideration is more political in nature, in that it depends on the wants and desires of the American people, as reflected by the actions of their elected representatives in the Congress. It is clear that modifications of the program benefit and tax levels can be made within the current program structure to restore sound financial status. But it is up to each generation to come to a consensus on the tax levels it is willing to pay and the benefit levels it wants to receive. Even the form of benefits and mode of financing, historically defined as monthly benefits financed generally on a PAYGO basis, are open to consideration by the American people and future Congresses.

The trustees report does, however, provide insight into the sustainability of currently scheduled benefits by providing a comparison of program cost and scheduled tax revenues, expressed as percentages of the total output of goods and services in the United States—our gross domestic product (GDP).

Projected OASDI cost is expected to rise from about 4.5 percent of GDP since 1990, to about 6 percent of GDP over the next 20 years, and to roughly stabilize at that level thereafter (see Chart 5). Although an increase in the cost of the program from 4.5 to

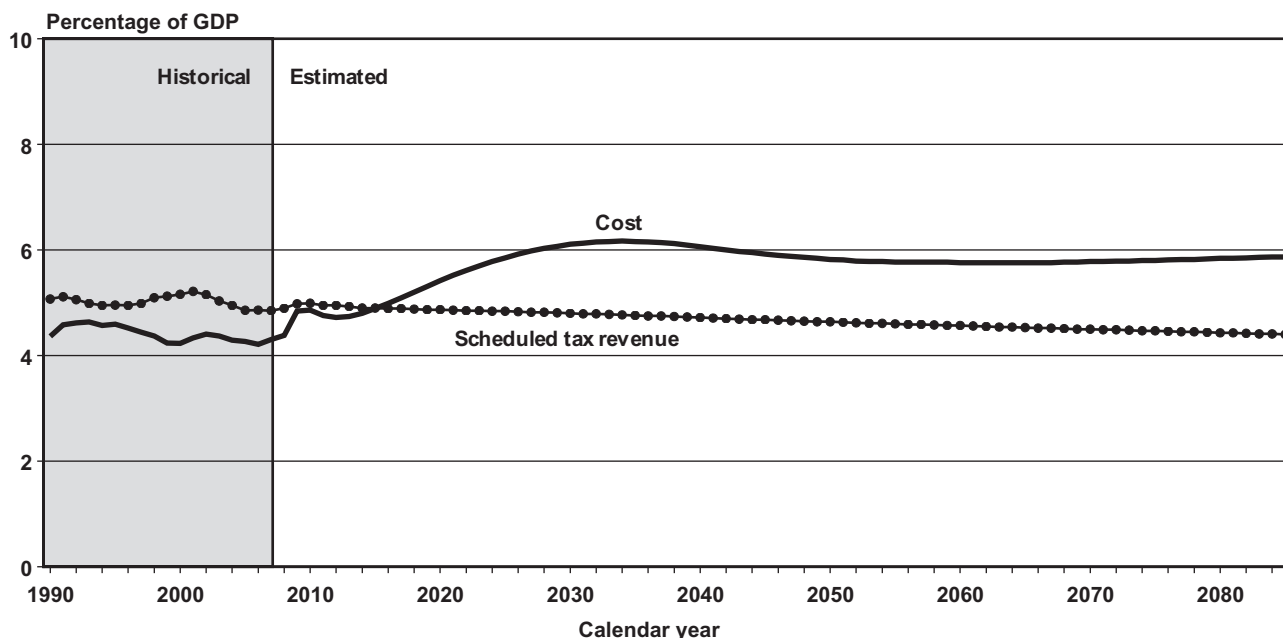
6 percent of GDP is substantial, the fact that the increase is not projected to continue after this “level shift” is important. Chart 5 focuses on the question of whether the level of benefits scheduled in current law should be maintained for future generations, at the price of higher taxes, or whether scheduled benefits should be reduced to levels affordable with the current taxes in the law.

The Federal Accounting Standards Advisory Board has recently established new standards requiring reporting on the sustainability of all federal programs as a part of the *Consolidated Financial Report of the United States Government*. In this context, consideration of the OASDI program must be on the basis of cost and income as a percent of GDP, in order to compare with and combine with other programs.

A Range of Financial Measures

The financial status of the OASDI program can be considered in numerous ways. As indicated earlier, the most fundamental consideration is whether scheduled benefits will be payable on a timely basis (solvency) as indicated by having positive trust fund reserve levels. Trust fund exhaustion, which is currently projected to occur for OASDI during 2037, would mean a precipitous drop in the level of benefits that could be paid. Thus, a projected date of trust fund exhaustion

Chart 5.
OASDI program cost and noninterest income as percentages of GDP, 1990–2008, projected under the intermediate assumptions, 2009–2085



SOURCE: 2009 Social Security Trustees Report, Figure II.D5 and Table VI.F4.

represents the time by which some change must occur. Congress can be expected to act by this time in order to avoid the dire consequences of inaction. A second fundamental consideration mentioned earlier is sustainability of the program on financial and political bases. Sustainability in both senses can be reasonably addressed by considering the share of the total output of the economy (GDP) that will be needed to support the benefits provided by the program.

It is often desired to express in a single number the outcome of a complex process. Historically, a single summary number, referred to as the actuarial balance, has been used as a measure of the financial status of the OASDI program. The actuarial balance expresses the difference between resources available under current law and the cost of providing scheduled benefits under current law, over the next 75 years as a whole. In the *2009 Trustees Report*, under intermediate assumptions, the actuarial balance is negative, indicating a shortfall for the period as a whole equivalent to 2.00 percent of the taxable payroll over the period. While this measure is convenient because of its simplicity, it is of somewhat limited usefulness taken alone. The actuarial balance does not address the timing or trend in shortfalls that are projected on an annual basis over the period. In fact, this 75-year summary measure can only indicate one thing definitively: the level of the trust fund at the end of the 75-year period. If changes were made that resulted in an actuarial balance measured at zero, this would indicate that the trust fund assets at the end of the 75-year period were projected to equal the annual cost of the program at that time. But this summary measure alone would provide no information about whether (1) the trust fund would be solvent throughout the period, or (2) the level of trust fund assets would be rising, stable, or declining toward exhaustion at the end of the period.

The fact that the 1983 amendments were enacted with a projected trust fund level that was declining rapidly at the end of the period toward exhaustion soon thereafter may be attributed at least in part to an overreliance on the single measure of actuarial balance. Since 1983, many additional measures have been developed and have been used widely. One of the best measures has been the concept of “sustainable solvency.”

Sustainable solvency requires both that the trust fund be positive throughout the 75-year projection period and that the level of trust fund reserves at the end of the period be stable or rising as a percentage of the annual cost of the program. When these conditions are met, it can be said that under the assumptions

used, program financing is projected to be adequate for the foreseeable future. This concept was fully developed and in place by the time of the 1994–1996 Social Security Advisory Council and was used by the council as a guide for constructing alternative reforms for the OASDI program. Since that time, the concept of sustainable solvency has been addressed by virtually every comprehensive reform proposal developed by all policymakers. Requiring that proposals meet the requirements of sustainable solvency provides strong assurance that we will not face substantial projected deficits for the OASDI program soon after enactment of the next comprehensive reforms for the program. Numerous comprehensive proposals have been developed by policymakers over the past 15 years and have been scored by the Office of the Chief Actuary.⁶

An additional measure that has been used extensively in recent years is the annual balance between tax income and program cost for the 75th year in the long-range projection period. Although the overall shortfall for the period as a whole is shown to be 2.00 percent of taxable payroll, the shortfall is larger in the more distant years, reaching over 4 percent of payroll by 2083. Thus, individual reform provisions can be more fully understood by considering both their effect on the 75-year actuarial balance as a whole and their specific effect on the annual balance for the 75th year. Both of these measures are provided for individual provisions scored by the Office of the Chief Actuary.⁷

More recently, significant attention has been paid to additional summary measures such as the 75-year and infinite horizon open group unfunded obligations. An open group unfunded obligation shows the shortfall of revenue to cover all scheduled benefits over the period as a whole. The 75-year unfunded obligation for the OASDI program is shown as \$5.3 trillion in present value in the *2009 Trustees Report*. Taken alone, this value can be easily misinterpreted as being relevant as a shortfall in terms of today’s economy, as if it were an amount that is required today. In fact, this present value amount represents the sum total of shortfalls projected for 2037, after the combined trust fund is projected to become exhausted, through 2083. These shortfalls will be met by providing either additional tax revenue in those years or by reducing benefits over this period from the level currently scheduled. For this reason, the trustees provide the size of this 75-year unfunded obligation as percentages of OASDI taxable payroll (1.9 percent) and of GDP (0.7 percent) over the 75-year period. These percentages provide context for understanding the magnitude of additional tax revenue

that is needed to fully meet the unfunded obligations represented by the currently scheduled benefits.

Over the infinite horizon, the *2009 Trustees Report* indicates that the present value shortfall, or unfunded obligation, for the OASDI program is about \$15.1 trillion, or about 3.4 percent of taxable payroll, and 1.2 percent of GDP over the entire infinite future period. Of course, these values must be considered in the context of the high level of uncertainty that accompanies any projection extending beyond the 75-year, long-range period.

In addition, the *2009 Trustees Report* provides an estimate of the closed group unfunded obligation. This value is highly theoretical in nature, as the closed group unfunded obligation is only truly meaningful for a program that is intended to be “fully advance funded.” A fully advance funded program would have sufficient trust fund assets at any time to eliminate future contributions (payroll taxes) into the system by all current and future workers, with sufficient assets available to still pay all benefits earned to date. For this kind of financing, the closed group unfunded obligation would be expected to be zero or near zero. For a program that has been intentionally financed on a PAYGO basis, however, a large closed group unfunded obligation would be expected. In the *2009*

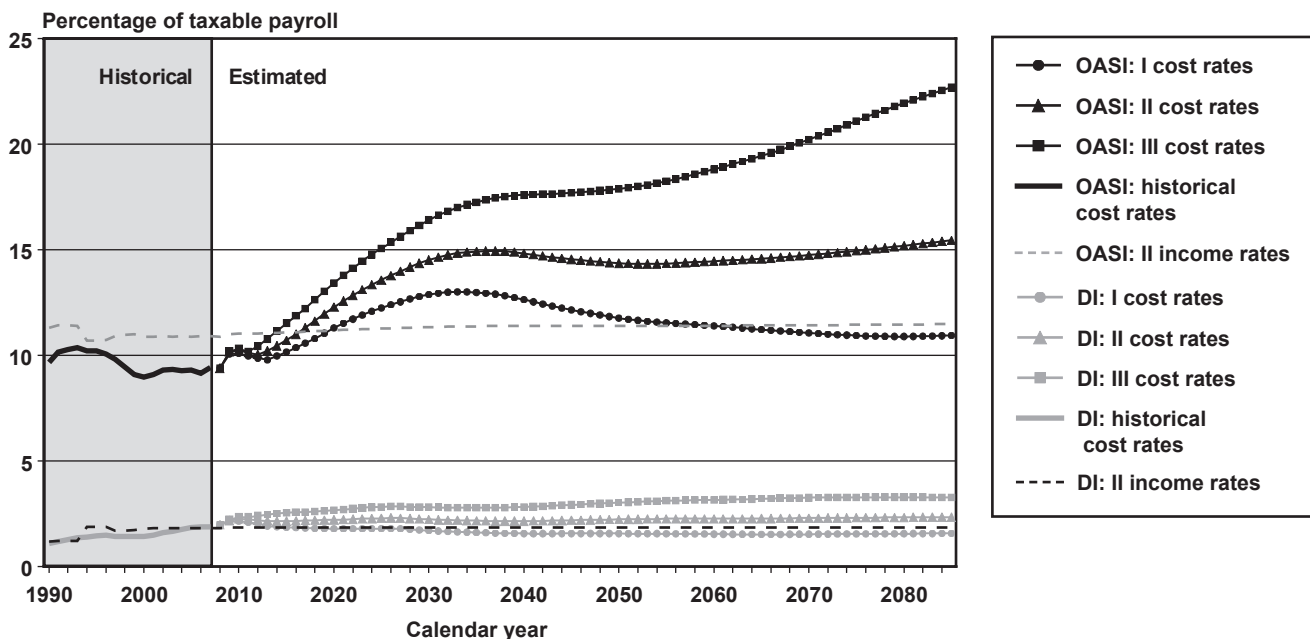
Trustees Report, the OASDI closed group unfunded obligation is reported as \$16.3 trillion, or 3.7 percent of taxable payroll, and 1.2 percent of the GDP over the infinite future.

Uncertainty of the Future

Projections of cost and income for the OASDI program are inherently uncertain. This uncertainty is thought to increase for more extended periods into the future. The trustees attempt to illustrate the nature and extent of uncertainty in the annual reports in several ways. Mentioned earlier are the high-cost and low-cost alternatives to the intermediate sets of assumptions. These alternatives provide scenarios in which the principal assumptions used for projecting the financial status of the program are assumed to collectively differ from the best estimate in either a positive or negative direction. Each parameter is assumed to differ by a plausible amount from the intermediate expectation, so it is unlikely that all parameters will differ in the same direction. As a result, the three alternative projections produce a broad range for the prospects of the program.

The range of cost rates projected for the OASI and DI programs under the three alternatives in the *2009 Trustees Report* are shown in Chart 6. Trust fund levels expressed as a percent of annual program cost

Chart 6.
OASI and DI program cost and noninterest income as percentages of taxable payroll, 1990–2008, projected under alternative assumptions, 2009–2085



SOURCE: *2009 Social Security Trustees Report*, Figure IV.B1 and Table IV.B1.

NOTES: Alternative I = low-cost assumptions; alternative II = intermediate assumptions; alternative III = high-cost assumptions.

were presented earlier for the three alternative projections. Projected income rates are shown based on the intermediate alternative II assumptions only, as these rates vary little across the three alternatives.

The trustees report also presents sensitivity analyses showing the effect of variation in individual parameters. These estimates provide a sense of the sensitivity of the long-range financial status of the program to any difference that may evolve in a given parameter from the trustees' intermediate projection.

Finally, the trustees report presents stochastic projections of the potential financial operations of the OASDI program in the future. For these projections, many economic, demographic, and disability-related parameters are allowed to vary randomly through time, creating 5,000 separate possible projection scenarios. The random variation reflects the degree of historical fluctuation in each parameter and is intended to simulate a large number of scenarios that could occur in the future. Results are presented in the report for the future cost and trust fund levels of the program, showing year-by-year the distribution of results from the 5,000 separate projections. The distribution derived from these stochastic projections for the *2009 Trustees Report* is shown in Chart 7. Stochastic results have the advantage of showing an estimated

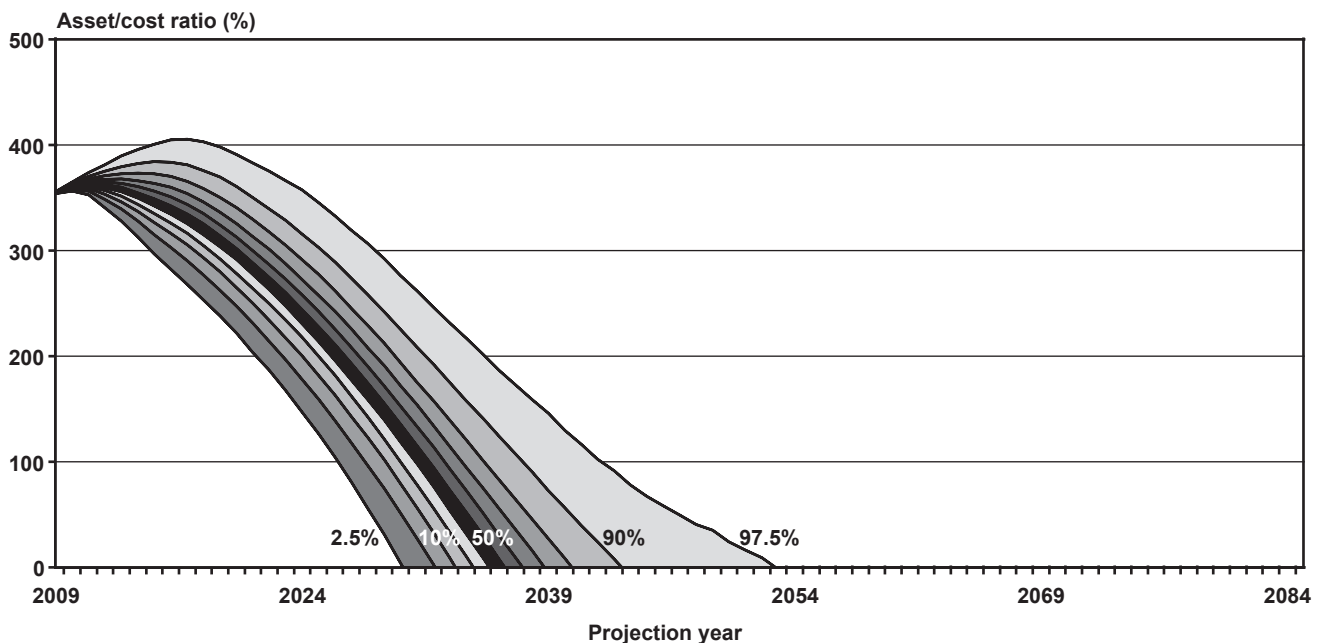
likelihood that actual results will fall within or outside any probability interval. (For example, the 95 percent probability interval falls between the lines in the chart representing the 97.5 percentile and 2.5 percentile outcomes.) It should be noted that lines on this chart do not represent specific individual simulations. Rather, for each line, the value in a year is for the simulation that is at the given percentile in *that specific year*. For any percentile line, the specific simulation from among the 5,000 scenarios will vary from one year to the next.

The stochastic projections suggest a high degree of certainty that the combined OASDI trust fund will become exhausted well before 2083, the end of the 75-year, long-range period. It should be noted, however, that the stochastic projection methodology is still being developed and refined. We believe that further enhancements are likely to broaden the range of uncertainty shown for the trust fund exhaustion date across any probability interval.

Actuarial Status and Budget Scoring

The requirements in the law for the annual report of the Social Security Board of Trustees are specific on the nature of the analysis that is desired. Although the OASDI program is highly dependent on the trust fund

Chart 7.
Stochastic projection of OASDI trust fund assets as a percentage of program cost, 2009–2084



SOURCE: *2009 Social Security Trustees Report*, Figures II.D7 and VI.E1.

NOTE: The values assigned to charted lines are probability percentiles; thus, the 95 percent probability interval, for example, falls between the lines labeled 2.5 percent and 97.5 percent.

assets for solvency, and these assets are held in Treasury securities, the assessment of the actuarial status of the program is separate from direct consideration of implications for the federal government budget.

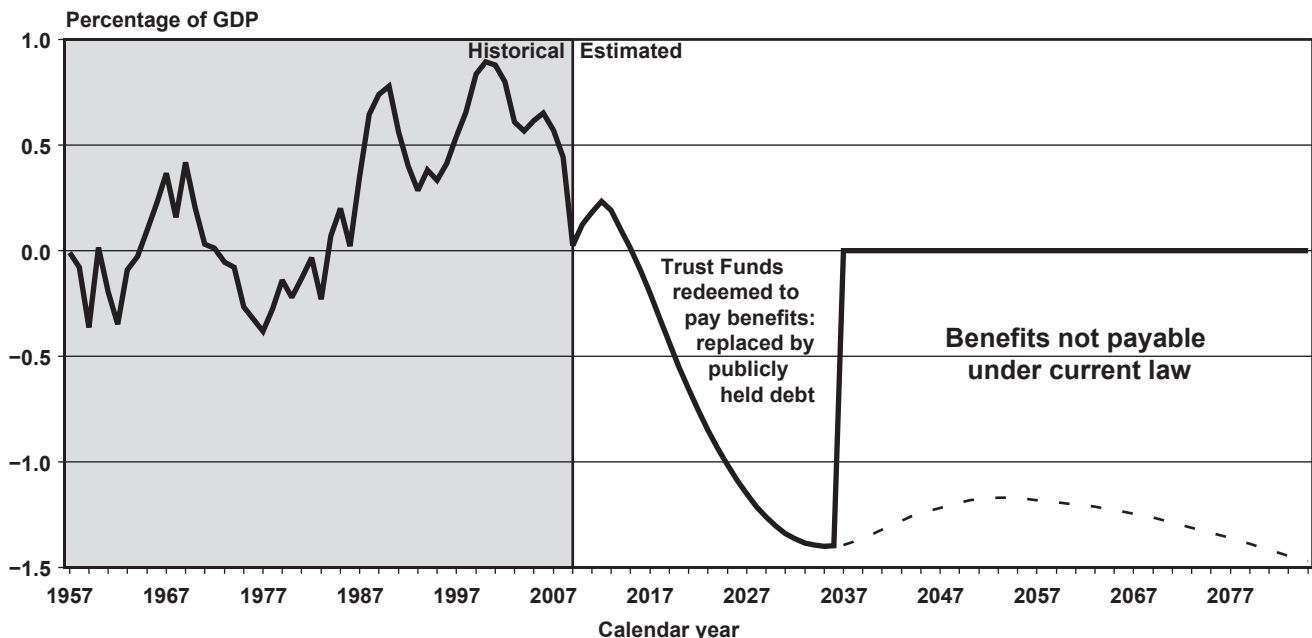
The assets of the trust funds are required to be invested in interest-bearing securities guaranteed as to interest and principal by the full faith and credit of the U.S. government. As a result, all assets are currently invested in nonmarketable special-issue obligations of the Treasury. In scoring assets and liabilities for the federal government as a whole, the trust fund assets are generally assumed to be a wash: an asset for the trust funds, but an equal liability for the General Fund of the Treasury. This is a valid perspective, but it does not lessen the claim that the trust fund assets have for future cash when needed. Trust fund securities have always been redeemed on maturity or when needed, and there is no risk of default on these securities. Moreover, it is reasonable to assume that the financial markets understand that securities held by the trust funds may be redeemed in the future, requiring the Treasury to collect additional taxes, lower other federal spending, or borrow additionally from the public. In fact, the trust fund assets are combined with publicly held debt to compute the total debt subject to limit, which is subject to approval by the Congress. If the redemption of trust fund securities in the future

results in issuance of additional publicly held debt, this would not alter the total federal debt (see Chart 8).

An additional important distinction in trust fund versus budget scoring is the assumption about current law. In the trustees report, careful distinction is made between the cost of the program—reflecting scheduled benefits, and the actual expenditures—reflecting the benefits that would be payable subject to the limits imposed by the inability of the trust funds to borrow. If the trust funds ever become exhausted, expenditures thereafter would be limited to the amount of continuing tax income. It is projected in the *2009 Trustees Report* that only 76 percent of scheduled benefits would be payable and could be paid at the time the trust fund is exhausted in 2037. This limitation not only places an absolute braking force on the spending that is possible by the OASDI program, but also forces Congressional action before exhaustion of the funds.

Budget scoring convention, on the other hand, assumes that full scheduled benefits would continue to be paid on a timely basis even after the fund is exhausted and the continuing tax income is insufficient to finance full scheduled benefits under the law. When considering the potential effects of the OASI, DI, and HI programs on projected unified budget balances, it should be noted that these projections presume changes in the law that would, in effect, allow the trust

Chart 8.
OASDI net cash flows as a percentage of GDP, 1957–2009, projected under the intermediate assumptions, 2010–2085



SOURCE: Social Security Administration, Office of the Chief Actuary.

funds to either borrow from the General Fund of the Treasury or to receive transfers from that fund sufficient to continue full payment of scheduled benefits.

What is Causing the Financial Status to Show Shortfall?

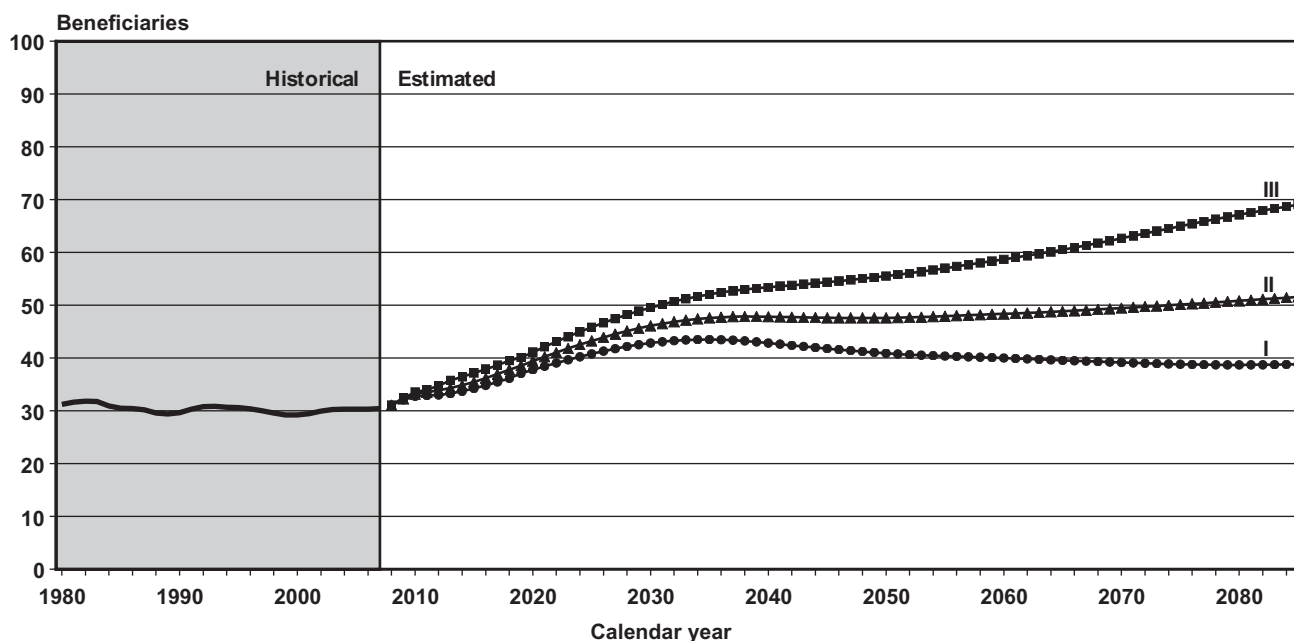
With the current 12.4 percent payroll tax rate, along with additional revenue from federal income taxation of benefits, the OASDI program has been taking in more tax revenue than it has spent providing benefits for more than two decades. However, this favorable cash flow will be changing in the future as the large baby boom generation, born from 1946 through 1965, moves into retirement. The oldest people in this generation have already reached early retirement age (62), and the transfer of this generation from working age to retirement age will continue for the next 20 years. The substantial increase in the cost of the OASDI program from 2010 to 2030, both as a percent of taxable payroll and GDP, is founded in an even more basic shift in our economy: the change in the ratio of beneficiaries to the number of workers.

Chart 9, showing the number of beneficiaries for each 100 OASDI-covered workers, is almost identical in shape and timing to Chart 6, which shows the projected annual cost rates of the program. This should

not be surprising because benefits over time rise at roughly the same rate as the average wage in the workforce. What is notable is that the strong upward shift in both this ratio and in the cost rate is permanent; it does not come back down to a lower level after the large baby boom generation dies off. The permanence of this shift was not caused by the existence of the baby boom generation; instead, the permanent shift was caused by the substantial and apparently permanent drop in birth rates that followed the baby boom births.

Birth rates that averaged over three children per woman during the baby boom period (1946–1965) dropped to just two children per woman by 1970 and have remained at about that level since that time (see Chart 10). Considering even longer historical periods helps in understanding the significance of the drop in birth rates in the United States (Table 1). It may be surprising to see how high birth rates were back in 1875 (over four children per woman) and how much they dropped by 1925 (to three children per woman). Reductions in death rates during infancy and early childhood help explain much of the longer-term decline in birth rates. Before 1900, the probability that a newborn would survive to age 5 or 10 was far below 100 percent. Thus, in order to have a family with a desired number of children surviving to adulthood,

Chart 9.
Number of OASDI beneficiaries per 100 covered workers, 1980–2008, projected under alternative assumptions, 2009–2085

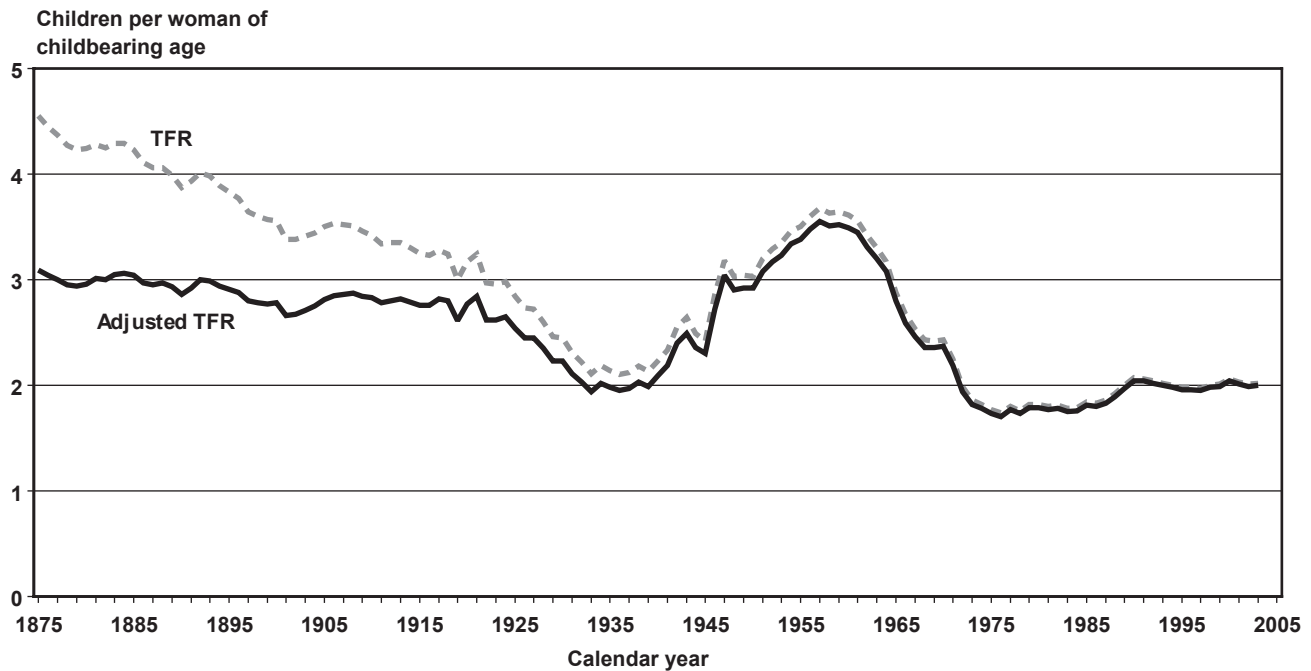


SOURCE: 2009 Social Security Trustees Report, Figure IV.B2 and Table IV.B2.

NOTES: Alternative I = low-cost assumptions; alternative II = intermediate assumptions; alternative III = high-cost assumptions.

Chart 10.

Total U.S. fertility rates with and without adjustment for survival to age 10, 1875–2005



SOURCE: Social Security Administration, Office of the Chief Actuary.

NOTE: TFR = total fertility rate.

Table 1.
Annual average total U.S. fertility rates with and without adjustment for survival to age 10, various periods, 1875–2003

Period	Average TFR	Adjusted TFR
1875–1925	3.67	2.85
1926–1965	2.84	2.69
1966–1990	1.99	1.95
1991–2003	2.01	1.99

SOURCE: Social Security Administration, Office of the Chief Actuary.

NOTE: TFR = total fertility rate.

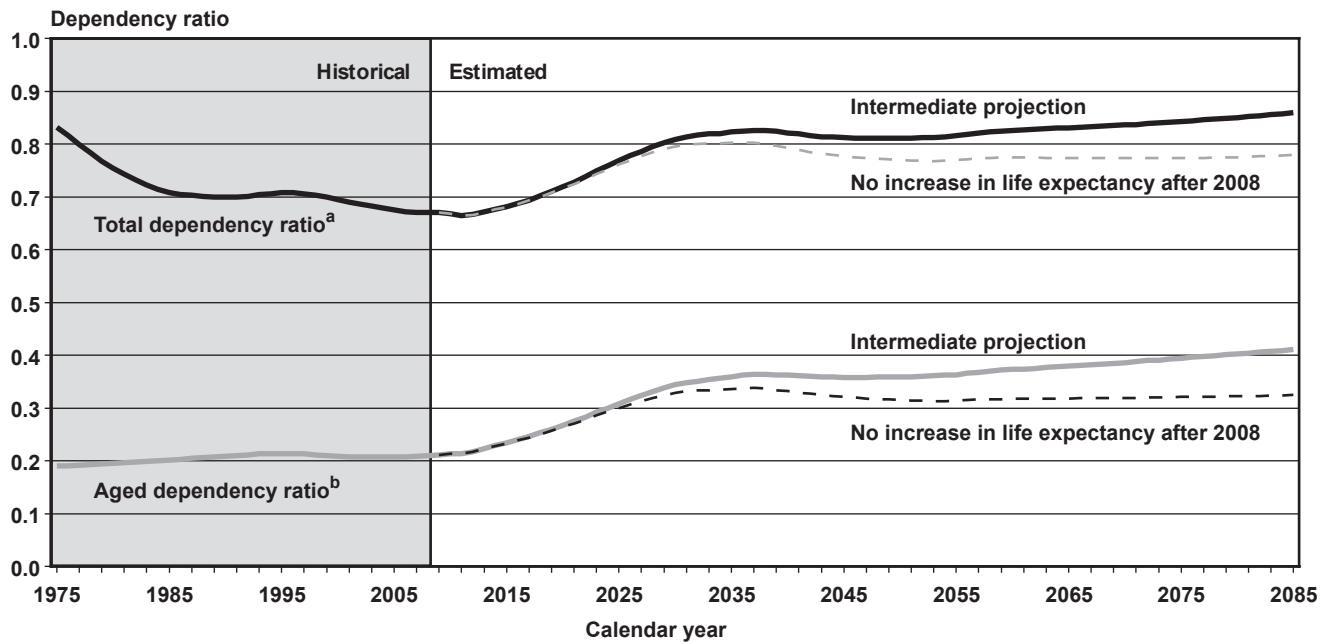
more births were required in the past. Adjusting birth rates to include only those children who survive to age 10⁸ results in fairly flat total fertility rates near three children per woman from 1875 through 1925. From 1926 through 1965, this adjusted total fertility rate was still about 2.7 births per woman, on average, including both the temporary low-birth period of the Great Depression and World War II, and the temporary high-birth period after World War II. After 1965, however, the total fertility rate shifted to a new level around two children per woman. It is this apparently permanent shift to lower birth rates in the United

States that is the principal cause of our changing age distribution between 2010 and 2030 and the resulting shift in the ratio of beneficiaries to workers.

Chart 11 demonstrates even more vividly the impact of the changes in birth rates on the age distribution of the population. The aged dependency ratio (ratio of population aged 65 or older to the population at working ages, 20–64) has been almost flat since 1975 and was held down between 1994 and 2010 as the relatively low-birth-rate generations born during the Great Depression and World War II (1929–1945) reached age 65. However, this ratio will rise substantially between 2010 and 2030, reflecting both the attainment of age 65 by the baby boom generation (born 1946 to 1965) and entry into the working ages of low-birth-rate generations (born after 1965) that followed the baby boom. The dashed line in the chart illustrates what the projected dependency ratios would be if we assumed no further improvement in life expectancy after 2008.⁹ The chart demonstrates that through 2030, the upward shift in the ratio is almost entirely because of the changing birth rate. The illustration for the total dependency ratio (ratio of the population aged 65 or older or younger than age 20 to the population at working ages, 20–64) tells essentially the same story.

Chart 11.

Total and aged dependency ratios, 1975–2008, projected under alternative life expectancy assumptions, 2009–2085



SOURCE: 2009 Social Security Trustees Report, Table V.A2 and the Social Security Administration, Office of the Chief Actuary.

NOTE: Projections reflect the intermediate assumptions.

a. Ratio of the population aged 65 or older and under age 20 to the population aged 20–64.

b. Ratio of the population aged 65 or older to the population aged 20–64.

Chart 11 also shows that improving life expectancy after 2008 does begin to produce significant effects on the age distribution of the population after 2030. But the permanent shift in the age distribution between 2010 and 2030 because of lower birth rates remains the dominant factor for the increased Social Security program cost over the next 75 years.

The effect of changes in real wage growth, productivity, labor force participation, price inflation, unemployment rates, and other economic factors all have significant impact on the future cost of Social Security. However, most of these variables, and in particular real average wage growth, affect both the tax income and the benefits of the program—as a result having offsetting effects on the program as a whole. In addition, shifts in these parameters have not been as dramatic as the change in birth rates.

Future Changes for the Social Security Program

One useful way to describe the effect of the change in the aged dependency ratio and the resulting effect on the ratio of beneficiaries to workers is to consider the

implied number of workers per beneficiary. For the past 35 years, there have been about 3.3 workers per beneficiary (consistent with the ratio of 30 beneficiaries per 100 workers). After 2030, the ratio will be two workers per beneficiary (consistent with 50 beneficiaries per 100 workers).

With the average worker benefit currently at about \$1,000 per month, 3.3 workers would need to contribute about \$300 each per month to provide a \$1,000 benefit. But after the population age distribution has shifted to have just two workers per beneficiary, each worker would need to contribute \$500 to provide the same \$1,000 benefit.

Thus, in order to meet increased Social Security costs, substantial change will be needed. The intermediate projections of the 2009 Trustees Report indicate that if we wait to take action until the combined OASDI trust fund becomes exhausted in 2037, benefit reductions of around 25 percent or payroll tax increases of around one-third (a 4 percent increase in addition to the current 12.4 percent rate) will be required. Past legislative changes for Social Security suggest that the next reform is likely to include

a combination of benefit reductions and payroll tax increases.

Because the large shift in the cost of the OASDI program over the next 20 years is not due to increasing life expectancy, it is not clear that increasing the NRA should be the principal approach for restoring long-term solvency. Increasing the unreduced retirement age beyond 67 is one option that may be considered, given that the population may be healthier in the future and able to work to an older average age. However, this raises the question of the adequacy of monthly benefit levels. After the NRA reaches 67, those persons claiming benefits at age 62 will receive only 70 percent of the unreduced benefit level. Further increase in the NRA would decrease the adequacy of monthly benefits at age 62, and at all other ages, even further.

There is no one clear solution to the problem of increased cost for retirees because of fewer workers available to support the retirees, which in turn is caused by lower birth rates. This issue is not specific to Social Security, but also affects Medicare as well as many other private and public retirement income systems. The decline in birth rates has been far more dramatic in Japan and many European countries that are struggling with the effects of aging populations because of declines in birth rates even more severe than in the United States.¹⁰

A variety of possible changes to the provisions of the Social Security Act have been considered by policymakers and have been scored by the Office of the Chief Actuary. The reader is invited to look through these options, both as individual provisions and comprehensive proposals for improving solvency of the OASDI program.¹¹

Notes

Acknowledgments: This article is possible only as a result of the consistent efforts of the Social Security Board of Trustees and their staffs in producing a highly professional and informative report each year. Particular appreciation is extended to Karen Glenn of the Office of the Chief Actuary for her invaluable review and editing of the article. In addition, Michael Leonesio, David Weaver, and Jason Fichtner of the Office of Retirement and Disability Policy provided critical and constructive comments on the draft that contributed substantially to the end product.

¹ These estimates reflect the intermediate assumptions of the Social Security Board of Trustees in their *2009 Annual Trustees Report*. The Congressional Budget Office (CBO)

has been making similar estimates for several years that tend to be somewhat more optimistic than the trustees' estimates principally because CBO assumes faster growth in labor productivity and real earnings levels for the future.

² The *1983 Trustees Report* also included low-cost and high-cost projections, providing a range of possibilities and illustrating the uncertainty of these projections. The high-cost projection, referred to as alternative III, showed exhaustion of the combined OASI and DI Trust Funds in 2027.

³ A very limited amount of short-term borrowing from the General Fund of the Treasury is permitted in the law. Expected tax receipts for a month can be made available at the beginning of the month when this would be needed to allow timely payment of benefits. This advance tax transfer requires repayment to the General fund with interest by the end of the month. Thus, solvency is not effectively extended to any substantial degree by this provision.

⁴ However, actual experience since the issuance of the *2009 Trustees Report* now suggests that a slightly deeper recession than previously expected will result in a temporary cash flow shortfall in 2010.

⁵ In addition to the uncertainties about economic and population trends, alternatives I and III incorporate assumptions that ultimate disability incidence rates will be 19 percent lower and 21 percent higher, respectively, than the average level over the period 1970 through 2008.

⁶ Memoranda for these proposals can be found at <http://www.socialsecurity.gov/OACT/solvency/index.html>.

⁷ Available at <http://www.socialsecurity.gov/OACT/solvency/provisions/index.html>.

⁸ The probability of survival from birth to age 10 is readily obtainable in the life tables for years starting in 1900, available at <http://www.socialsecurity.gov/OACT/NOTES/s2000s.html>. For the illustration provided here, these probabilities were extrapolated back to 1875, consistent with the trend in decennial census data for the population of the state of Massachusetts.

⁹ For this illustration, it is assumed that death rates at all ages remain at the level experienced in 2008 for all future years.

¹⁰ See, for example, <http://www.oecd.org/dataoecd/13/38/16587241.pdf>.

¹¹ For individual provisions, see <http://www.socialsecurity.gov/OACT/solvency/provisions/index.html>.

For comprehensive proposals, see <http://www.socialsecurity.gov/OACT/solvency/index.html>.

In addition, for detailed projections of the *2009 Trustees Report*, see <http://www.socialsecurity.gov/OACT/TR/2009/index.html>. The full reports for prior years are available at <http://www.socialsecurity.gov/OACT/TR/index.html>.