Social Insurance

The social insurance programs consisting of Social Security, Medicare, Railroad Retirement, and Black Lung were developed to provide income security and health care coverage to citizens under specific circumstances as a responsibility of the Government. Because taxpayers rely on these programs in their long-term planning, social insurance program information should indicate whether the current statutory provisions of the programs can be sustained, and more generally what effect these provisions likely have on the Government's financial condition. The resources needed to run these programs are raised through taxes and fees. Eligibility for benefits depends in part on earnings and time worked by the individuals. Social Security benefits are generally redistributed intentionally toward lower-wage workers (i.e., benefits are progressive). In addition, each social insurance program has a uniform set of eligibility events and schedules that apply to all participants.

Social Security and Medicare

Social Security

The Federal Old Age and Survivors Insurance (OASI) Trust Fund was established on January 1, 1940, as a separate account in the Treasury. The Federal Disability Insurance (DI) Trust Fund, another separate account in the Treasury, was established on August 1, 1956. The OASI fund pays cash retirement benefits to eligible retirees and their eligible dependents and survivors, and the much smaller DI fund pays cash benefits to eligible individuals who are unable to work because of medical conditions and certain family members of such eligible individuals. Though the events that trigger benefit payments are quite different, both trust funds have the same dedicated financing structure: primarily payroll taxes and income taxes on benefits. All financial operations of the OASI and DI Programs are handled through these respective funds. The two funds are often referred to as the combined OASDI Trust Funds. At the end of calendar year 2016, OASDI benefits were paid to approximately 61 million beneficiaries.

The primary financing source for these two funds are taxes paid by workers, their employers, and individuals with self-employment income, based on work covered by the OASDI Program. Currently, employers and employees each pay 6.2 percent of taxable earnings, and the self-employed pay 12.4 percent of taxable earnings. Payroll taxes are levied on wages and net earnings from self-employment up to a specified maximum annual amount, referred to as maximum taxable earnings ($127,200 in 2017), that increases each year with economy-wide average wages.

Legislation passed in 1984 subjected up to half of OASDI benefits to income tax and allocated the revenue to the OASDI Trust Funds. In 1993 legislation increased the potentially taxed portion of benefits to 85 percent and allocated the additional revenue to the Medicare's Hospital Insurance Trust Fund.

Medicare

The Medicare Program, created in 1965, has two separate trust funds: the Hospital Insurance (HI) Trust Fund (otherwise known as Medicare Part A) and the Supplementary Medical Insurance (SMI) Trust Funds (which consists of the Medicare Part B and Part D[10] accounts). HI pays for acute inpatient hospital services, hospice, and major alternatives to hospitals (skilled nursing services, for example). SMI pays for hospital outpatient services, physician services, and assorted other services and products through the Part B account and for prescription drugs through the Part D account.

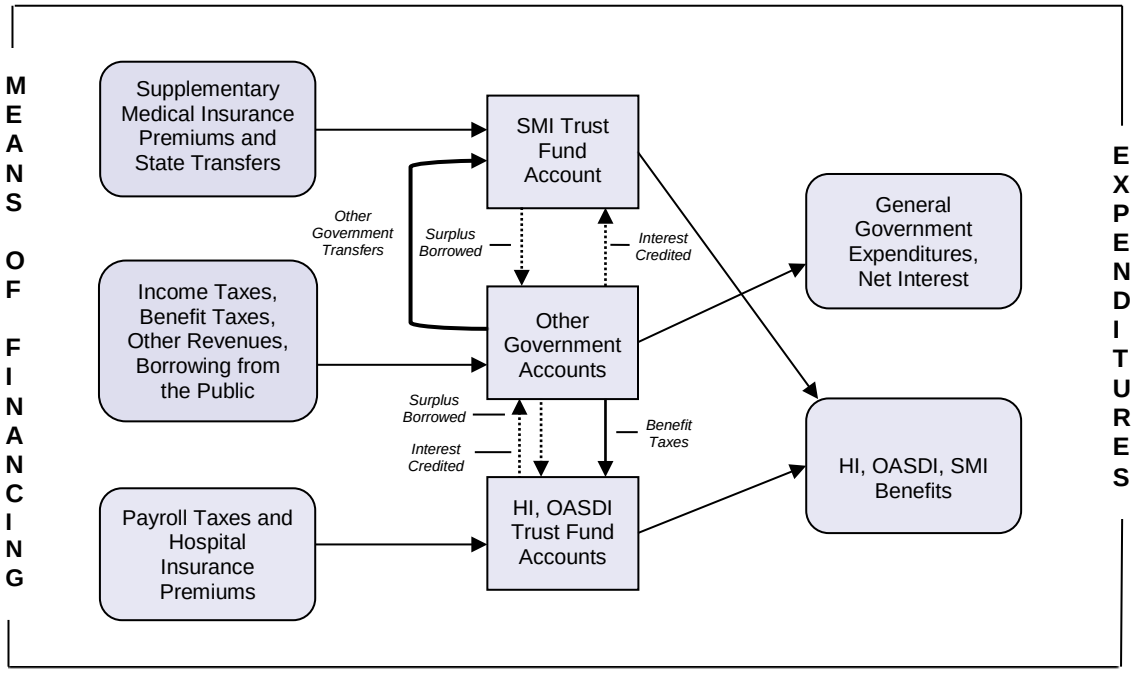
Though the events that trigger benefit payments are similar, HI and SMI have different dedicated financing structures. Similar to OASDI, HI is financed primarily by payroll contributions. Currently, employers and employees each pay 1.45 percent of earnings, while self-employed workers pay 2.9 percent of their net earnings. Beginning in 2013, employees and self-employed individuals with earnings above certain thresholds pay an additional HI tax of 0.9 percent on earnings above those thresholds. Other income to the HI Trust Fund includes a small amount of premium income from voluntary enrollees, a portion of the federal income taxes that beneficiaries pay on Social Security benefits (as explained above), and interest credited on Treasury securities held in the HI Trust Fund. As is explained in the next section, these Treasury securities and related interest have no effect on the consolidated statement of governmentwide finances.

For SMI, direct transfers from the General Fund financed 74 percent and 76 percent of 2017 program costs for Parts B and D, respectively. Premiums paid by beneficiaries and, for Part D state transfers, generally financed the remainder of

[10] Medicare legislation in 2003 created the new Part D account in the SMI Trust Fund to track the finances of a new prescription drug benefit that began in 2006. As is the case for Medicare Part B, a little more than three-quarters of revenues to the Part D account will come from future transfers from the General Fund. Consequently, the nature of the relationship between the SMI Trust Fund and the Federal Budget described below is largely unaffected by the presence of the Part D account though the magnitude will be greater.

expenditures. For beneficiaries dually eligible for Medicare and Medicaid, states must pay the Part D account a portion of their estimated foregone drug costs for this population (referred to as state transfers). As with HI, interest received on Treasury securities held in the SMI Trust Fund is credited to the fund. These Treasury securities and related interest have no effect on the consolidated statement of governmentwide finances. See Note 22—Social Insurance, for additional information on Medicare program financing.

Figure 1
Social Security, Medicare, and Governmentwide Finances



Social Security, Medicare, and Governmentwide Finances

The current and future financial status of the separate OASDI, HI, and SMI Trust Funds is the focus of the Social Security and Medicare Trustees' Reports, a focus that may appropriately be referred to as the "trust fund perspective." In contrast, the Government primarily uses the budget concept as the framework for budgetary analysis and presentation. It represents a comprehensive display of all federal activities, regardless of fund type or on- and off-budget status, and has a broader focus than the trust fund perspective that may appropriately be referred to as the "budget perspective" or the "governmentwide perspective." Social Security and Medicare are among the largest expenditure categories of the U.S. federal budget. This section describes in detail the important relationship between the trust fund perspective and the governmentwide perspective.

Figure 1 is a simplified depiction of the interaction of the Social Security and Medicare Trust Funds with the rest of the federal budget.[11] The boxes on the left show sources of funding, those in the middle represent the trust funds and other Government accounts, which include the General Fund into which that funding flows, and the boxes on the right show simplified expenditure categories. The figure is intended to illustrate how the various sources of program revenue flow through the budget to beneficiaries. The general approach is to group revenues and expenditures that are linked specifically to Social Security and/or Medicare separately from those for other government programs.

Each of the trust funds has its own sources and types of revenue. With the exception of General Fund transfers to SMI, each of these revenue sources represents revenue from the public that is dedicated specifically for the respective trust fund and cannot be used for other purposes. In contrast, personal and corporate income taxes as well as other revenue go into the

[11] The federal budget encompasses all Government financing and is synonymous with a governmentwide perspective.

General Fund and are drawn down for any Government program for which Congress has approved spending.[12] The arrows from the boxes on the left represent the flow of the revenues into the trust funds and other Government accounts.

The heavy line between the top two boxes in the middle of Figure 1 represents intragovernmental transfers to the SMI Trust Fund from other Government accounts. The Medicare SMI Trust Fund is shown separately from the two Social Security Trust Funds (OASI and DI) and the Medicare HI Trust Fund to highlight the unique financing of SMI. Currently, SMI is the only one of the programs that is funded through transfers from the General Fund, which is part of the other Government accounts (the SMI Part D account also receives transfers from the states). The direct transfers finance roughly three-fourths of SMI Program expenses. The transfers are automatic; their size depends on how much the program requires, not on how much revenue comes into the Treasury. If General Fund revenues become insufficient to cover both the mandated transfer to SMI and expenditures on other general Government programs, Treasury has to borrow to make up the difference. In the longer run, if transfers to SMI increase beyond growth in general revenues—and as shown in the Medicare Trustees Report and Chart 5 later in this section, they are projected to increase significantly in coming years—then Congress must either raise taxes, cut other Government spending, reduce SMI benefits, or borrow even more.

The dotted lines between the middle boxes of Figure 1 also represent intragovernmental transfers but those transfers arise in the form of "borrowing/lending" between the Government accounts. Interest credited to the trust funds arises when the excess of program income over expenses is loaned to the General Fund. The vertical lines labeled *Surplus Borrowed* represent these flows from the trust funds to the other Government accounts. These loans reduce the amount the General Fund has to borrow from the public to finance a deficit (or likewise increase the amount of debt paid off if there is a surplus). However, the General Fund has to credit interest on the loans from the trust fund programs, just as if it borrowed the money from the public. The credits lead to future obligations for the General Fund (which is part of the other Government accounts). These transactions are indicated in Figure 1 by the vertical arrows labeled *Interest Credited*. The credits increase trust fund income exactly as much as they increase credits (future obligations) in the General Fund. From the governmentwide standpoint, at least in an accounting sense, these interest credits are a wash.

When the trust funds get the receipts that they loan to the General Fund, these receipts provide additional authority to spend on benefits and other program expenses. The General Fund, in turn, has taken on the obligation of paying interest on these loans every year and repaying the principal when trust fund income from other sources falls below expenditures.

How loans from the trust funds to the General Fund and later repayments of those loans affect tax income and expenditures of the General Fund is uncertain. Two extreme cases encompass the possibilities. At one extreme, each dollar the trust funds loan to the General Fund might reduce borrowing from the public by a dollar at the time the loan is extended, in which case the General Fund could repay all trust fund loans by borrowing from the public without raising the level of public debt above the level that would have occurred in the absence of the loans. At the other extreme, each dollar the trust funds loan to the General Fund might result in some combination of higher General Fund spending and lower General Fund revenues amounting to one dollar at the time the loans are extended, in which case General Fund loan repayments to the trust funds might initially be financed with borrowing from the public but must at some point be financed with a combination of higher General Fund taxes and lower General Fund spending than would have occurred in the absence of the loans. In this latter extreme, trust fund loans result in additional largess (i.e., higher spending and/or lower taxes) in General Fund programs at the time the loans are extended, but ultimately that additional largess is financed with additional austerity (i.e., lower spending and/or higher taxes) in General Fund programs at later dates. The actual impact of trust fund loans to the General Fund and their repayment on General Fund programs is at one of these two extremes or somewhere in between.

Actual dollar amounts roughly corresponding to the flows presented in Figure 1 are shown in Table 1 for fiscal year 2017. In Table 1, revenues from the public (left side of Figure 1) and expenditures to the public (right side of Figure 1) are shown separately from transfers between Government accounts (middle of Figure 1). Note that the transfers ($311.7 billion) and interest credits ($96.3 billion) received by the trust funds appear as negative entries under "All Other" and are thus offsetting when summed for the total budget column. These two intragovernmental transfers are the key to the differences between the trust fund and budget perspectives.

From the governmentwide perspective, only revenues received from the public (and states in the case of Medicare, Part D) and expenditures made to the public are important for the final balance. Trust fund revenue from the public consists of payroll taxes, benefit taxes, and premiums. For HI, the difference between total expenditures made to the public ($293.3 billion) and revenues ($289.0 billion) was $4.3 billion in 2017, indicating that HI had a relatively small negative effect on the overall budget outcome *in that year*. For the SMI account, revenues from the public (primarily premiums) fell short of total

[12] Other programs also have dedicated revenues in the form of taxes and fees (and other forms of receipt) and there are a large number of dedicated trust funds in the federal budget. Total trust fund receipts account for about 40 percent of total Government receipts with the Social Security and Medicare Trust Funds accounting for about two-thirds of trust fund receipts. For further discussion, see the report issued by the Government Accountability Office, *Federal Trust and Other Earmarked Funds*, GAO-01-199SP, January 2001. In the figure and the discussion that follows, all other programs, including these other dedicated trust fund programs, are grouped under "Other Government Accounts" to simplify the description and maintain the focus on Social Security and Medicare.

expenditures made to the public by $303.6 billion in 2017, which resulted in a net draw on the overall budget balance in that year. For OASDI, the difference between total expenditures made to the public ($944.7 billion) and revenues from the public ($905.4 billion) was $39.3 billion in 2017, indicating that OASDI had a negative effect on the overall budget outcome in that year. Combined OASDI payroll and benefit tax revenues were increased by $46.0 billion in fiscal year 2017.

The trust fund perspective is captured in the bottom section of each of the three trust fund columns. For HI, total revenues exceeded total expenditures by $5.3 billion in 2017, as shown at the bottom of the first column. For SMI, total revenues exceeded total expenditures by $8.3 billion. The total revenue for SMI is $422.4 billion ($110.4 + $312.0), which includes $312.0 billion transferred from other Government accounts (General Fund). Transfers to the SMI Program from other Government accounts (the General Fund), amounting to about 75 percent of program costs, are obligated under current law and, therefore, appropriately viewed as revenue from the trust fund perspective. For OASDI, total revenues of $991.9 billion ($905.4 + $86.5) exceeded total expenditures of $944.7 billion by $47.2 billion. Total revenues for OASDI included $86.5 billion in transfers from the General Fund, made up of interest credits of $86.5 billion.

Table 1
Revenues and Expenditures for Medicare and Social Security Trust Funds and the Total Federal Budget for the Fiscal Year ended September 30, 2017

	Trust Funds					
(In billions of dollars)	HI	SMI	OASDI	Total	All Other	Total[1]
Payroll taxes and other public revenues:						
Payroll and benefit taxes	283.9	-	905.4	1,189.3	-	1,189.3
Premiums	5.1	95.2	-	100.3	-	100.3
Other taxes and fees	-	15.2	-	15.2	2,010.1	2,025.3
Total	289.0	110.4	905.4	1,304.8	2,010.1	3,314.9
Total expenditures to the public[2]	293.3	414.0	944.7	1,652.0	2,328.6	3,980.6
Net results for budget perspective[3]	(4.3)	(303.6)	(39.3)	(347.2)	(318.5)	(665.7)
Revenues from other Government accounts:						
Transfers	2.1	309.6	-	311.7	(311.7)	
Interest credits	7.4	2.4	86.5	96.3	(96.3)	
Total	9.5	312.0	86.5	408.0	(408.0)	
Net results for trust fund perspective[3]	5.3	8.3	47.2	60.8	N/A	N/A

[1] This column is the sum of the preceding two columns and shows data for the total federal budget. The figure $665.7 was the total federal deficit in fiscal year 2017.

[2] The OASDI figure includes $4.5 billion transferred to the Railroad Retirement Board for benefit payments and is therefore an expenditure to the public.

[3] Net results are computed as revenues less expenditures.

Notes: Totals may not equal the sum of components due to rounding.
"N/A" indicates not applicable.

Cash Flow Projections

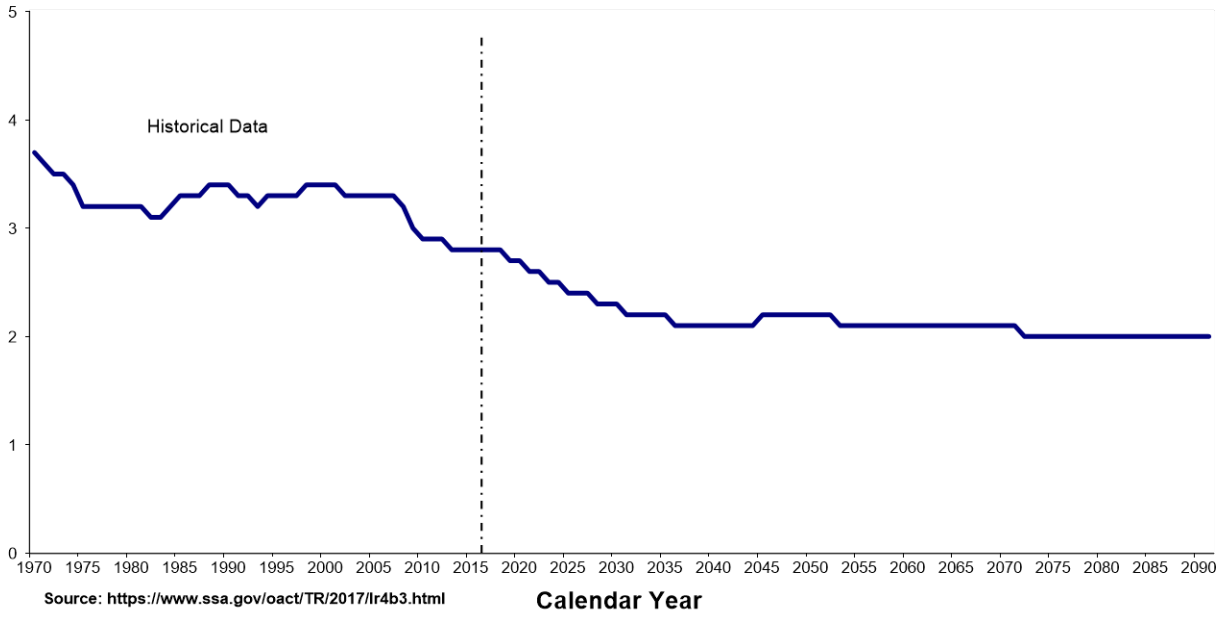
Background

Economic and Demographic Assumptions. The Boards of Trustees[13] of the OASDI and Medicare Trust Funds provide in their annual reports to Congress short-range (10-year) and long-range (75-year) actuarial estimates of each trust fund. Because of the inherent uncertainty in estimates for 75 years into the future, the Boards use three alternative sets of economic and demographic assumptions to show a range of possibilities. The economic and demographic assumptions used for the most recent set of intermediate projections for Social Security and Medicare are shown in the "Social Security" and "Medicare" sections of Note 22—Social Insurance.

[13] There are six trustees: the Secretaries of the Treasury (managing trustee), Health and Human Services, and Labor; the Commissioner of the Social Security Administration; and two public trustees who are appointed by the President and confirmed by the Senate for a 4-year term. By law, the public trustees cannot both be members of the same political party.

Worker-to-Beneficiary Ratio. The expenditure projections for both the OASDI and Medicare Programs reflect the aging of the large baby-boom generation, born in the years 1946 to 1964, and its ultimate passing. Under the intermediate assumptions, cost rates are projected to rise rapidly between 2017 and 2035, primarily because the number of beneficiaries rises much more rapidly than the number of covered workers as the baby-boom generation retires. For the most part, current workers pay for current benefits. Due to the lower fertility rates of the baby-boom generation as compared to those of their parents' generation, and the expected low fertility rates of all future generations, there is a relatively smaller number of persons born after the baby boom who will then finance the retirement of the baby-boom generation. Chart 1 shows that in 2016, every OASDI beneficiary had 2.8 workers to pay for his or her benefit. In 2030, however, after the last baby boomer turns 65, there will be only about 2.3 workers per beneficiary. The projected ratio continues to decline until there are just 2.0 workers per beneficiary by 2091. A similar demographic pattern confronts the Medicare Program. The number of workers per HI beneficiary declines from 3.1 in 2016 to 2.4 in 2030, and continues to decline throughout the projection period to 2091, when there are just 2.1 workers per HI beneficiary.

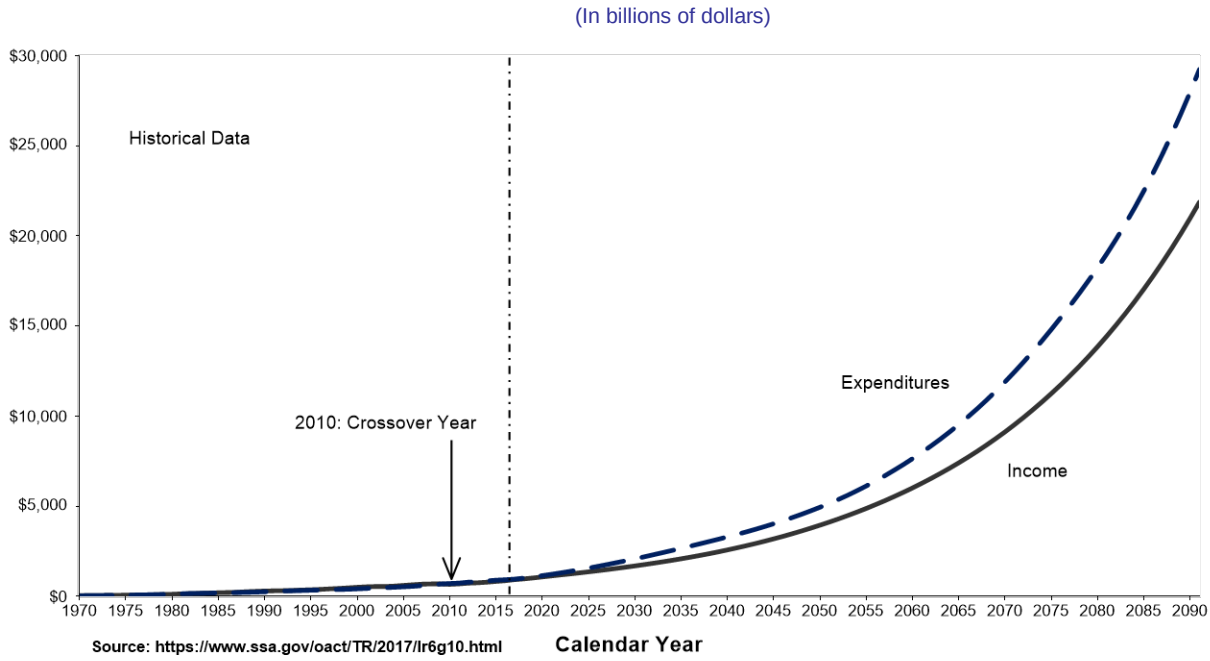
Chart 1—Number of Covered Workers per OASDI Beneficiary
1970-2091



Social Security Projections

Income and Expenditures. Chart 2 shows historical values and actuarial estimates of combined OASDI annual noninterest income and expenditures for 1970-2091. The estimates are for the open-group population of all workers and beneficiaries projected to be alive in each year. The expenditure projections in Chart 2 and all subsequent charts assume all scheduled benefits are paid regardless of whether the income and assets are available to finance them.

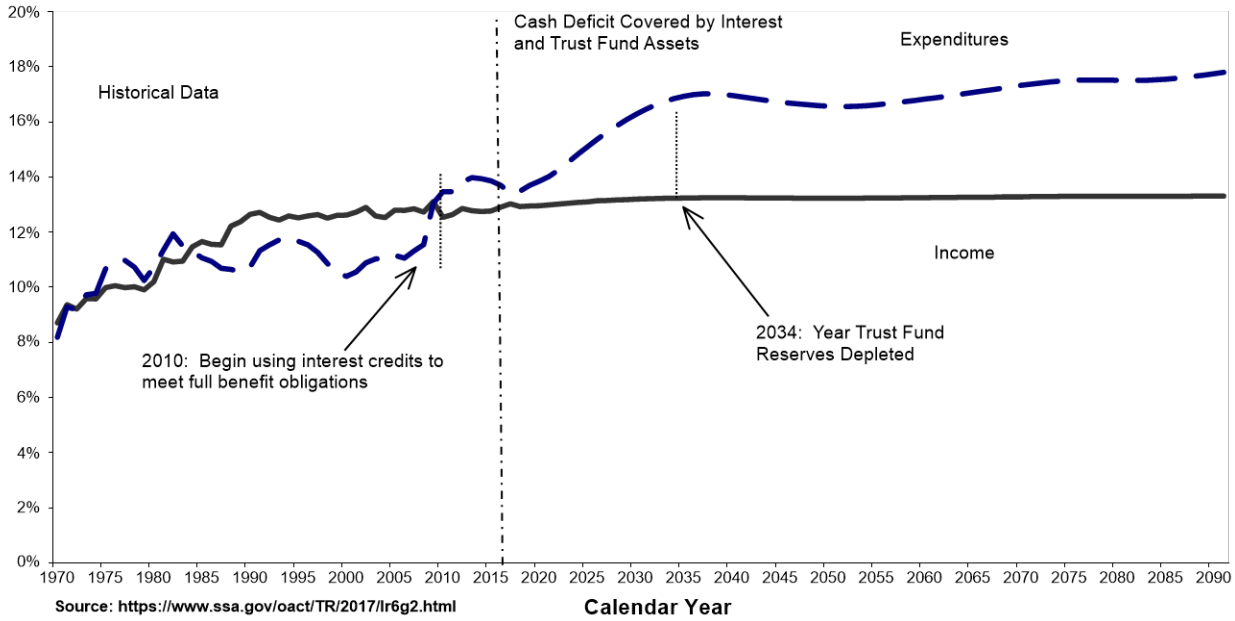
Chart 2—OASDI Income (Excluding Interest) and Expenditures 1970-2091



Annual OASDI cost exceeded noninterest income in 2010 for the first time since 1983. It is projected that cost will continue to exceed noninterest income throughout the 75-year valuation period. Projected OASDI cost increases more rapidly than projected noninterest income through 2037 primarily because the retirement of the baby-boom generation will increase the number of beneficiaries much faster than the number of covered workers increases, as subsequent lower-birth-rate generations replace the baby-boom generation at working ages. From 2038 to 2051, the cost rate (the ratio of program cost to taxable payroll) generally declines because the aging baby-boom generation is gradually replaced at retirement ages by historically low-birth-rate generations. Thereafter, increases in life expectancy cause OASDI cost to increase generally relative to noninterest income, but more slowly than between 2010 and 2037. Nevertheless, total trust fund income, including interest income, is more than sufficient to cover costs through 2021, so trust fund asset reserves continue to grow. Beginning in 2022, cost exceeds total income, and combined OASI and DI Trust Fund reserves diminish until they become depleted in 2034. After trust fund reserve depletion, continuing income is sufficient to support expenditures at a level of 77 percent of program cost for the rest of 2034, declining to 73 percent for 2091. To meet all OASDI cost on a timely basis, the combined OASI and DI Trust Funds need to redeem Treasury securities. To finance this redemption, the government will increase its borrowing from the public, raise taxes (other than OASDI payroll taxes), and/or reduce expenditures (other than OASDI cost).

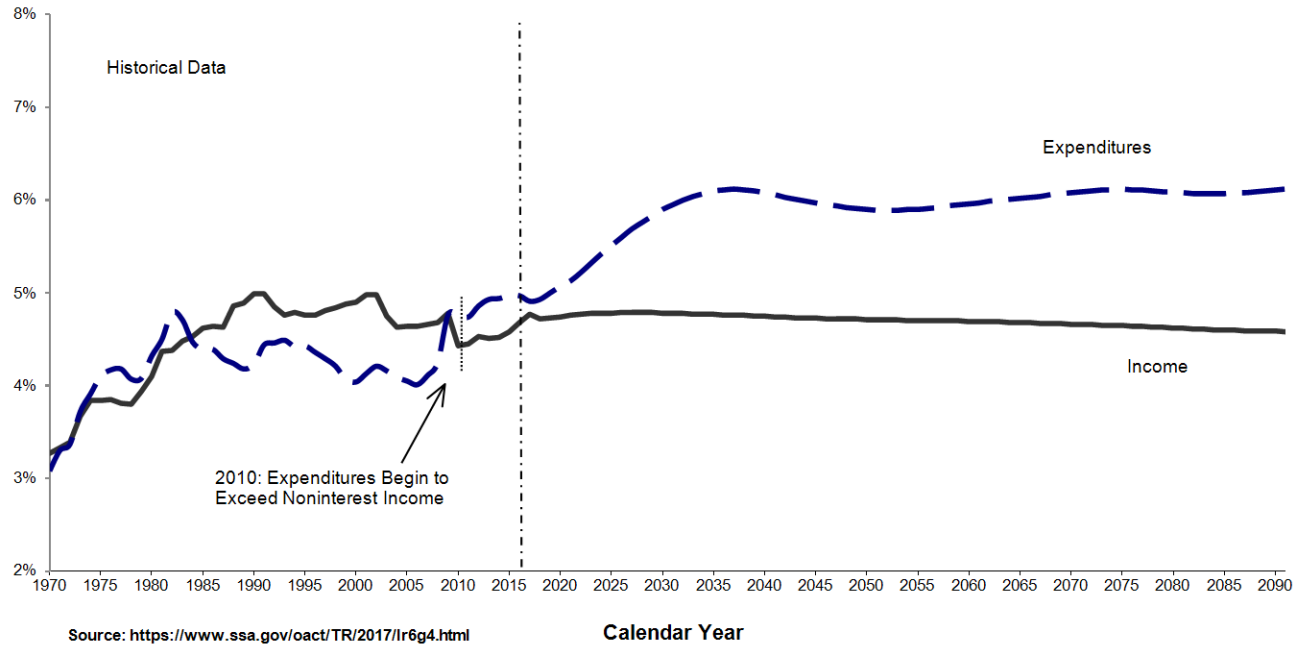
Income and Expenditures as a Percent of Taxable Payroll. Chart 3 shows annual noninterest income and expenditures expressed as percentages of taxable payroll, commonly referred to as the income rate and cost rate, respectively. Under the intermediate assumptions, demographic factors would by themselves cause the projected cost rate to rise rapidly for the next two decades before leveling off in about 2035. However, the recent recession temporarily depressed taxable earnings and increased the number of beneficiaries, which in turn sharply, but temporarily, increased the cost rate starting in 2009. From a peak in 2013, the cost rate declines through 2017 under the economic recovery and thereafter returns to a gradually rising trend. The projected income rate is stable at about 13 percent throughout the 75-year period.

Chart 3—OASDI Income (Excluding Interest) and Expenditures as a Percent of Taxable Payroll 1970-2091



Income and Expenditures as a Percent of GDP. Chart 4 shows estimated annual noninterest income and expenditures, expressed as percentages of GDP, which is the total value of goods and services produced in the United States. This alternative perspective shows the size of the OASDI Program in relation to the capacity of the national economy to sustain it. In calendar year 2016, OASDI cost was about $922 billion, which was about 5.0 percent of GDP. The cost of the program (based on current law) rises rapidly to 6.1 by 2037, then declines to 5.9 percent by 2050, and generally increases to 6.1 percent of GDP by 2091. The rapid increase from 2017 to 2035 is projected to occur as baby boomers become eligible for OASDI benefits, lower birth rates result in fewer workers per beneficiary, and beneficiaries continue to live longer. In 2091, expenditures are projected to exceed income by approximately 1.54 percent of GDP. As the economy recovers, Social Security's noninterest income, which reflects scheduled tax rates, remains at its current level of about 4.8 percent of GDP through 2040. Thereafter, noninterest income as a percent of GDP declines gradually, to about 4.6 percent by 2091, because the share of employee compensation provided as non-covered fringe benefits is expected to increase gradually.

Chart 4—OASDI Income (Excluding Interest) and Expenditures as a Percent of GDP 1970-2091



Source: https://www.ssa.gov/oact/TR/2017/lr6g4.html

Sensitivity Analysis. Projections of the future financial status of the OASDI program depend on many demographic and economic assumptions, including fertility, mortality, net immigration, average wages, inflation, and interest rates on Treasury securities. The income will depend on how these factors affect the size and composition of the working population and the level and distribution of wages and earnings. Similarly, the cost will depend on how these factors affect the size and composition of the beneficiary population and the general level of benefits.

Because perfect long-range projections of these factors are impossible and actual experience is likely to differ from the estimated or assumed values of these factors, this section is included to illustrate the sensitivity of the long-range projections to changes in assumptions by analyzing six key assumptions: average annual reduction in death rates, total fertility rate, real-wage differential, Consumer Price Index (CPI) change, net immigration, and real interest rate. For this analysis, the intermediate assumptions are used as the reference point, and each selected assumption is varied individually. The variation used for each individual assumption reflects the levels used for that assumption in the low-cost (Alternative I) and high-cost (Alternative III) projections. For example, when analyzing sensitivity with respect to variation in real wages, income, and expenditure projections using the intermediate assumptions are compared to the outcome when projections are done by changing only the real wage assumption to either low-cost or high-cost alternatives.

The low-cost alternative is characterized by assumptions that improve the financial status of the program (relative to the intermediate assumption) such as slower improvement in mortality (beneficiaries die younger). In contrast, assumptions under the high-cost alternative worsen the financial outlook. All present values are calculated as of January 1, 2017 and are based on estimates of income and cost during the 75-year projection period 2017-2091.

Table 2 shows the effects of changing individual assumptions on the present value of estimated OASDI expenditures in excess of income (the *shortfall* of income relative to expenditures in present value terms). The assumptions are shown in parentheses. For example, if the annual reduction in death rates were changed from 0.77 percent, the intermediate assumption, to 0.42 percent, meaning that people die younger, the shortfall for the period of estimated OASDI income relative to cost would decrease to $12,976 billion from $15,357 billion; if the annual reduction were changed to 1.16 percent, meaning that people live longer, the shortfall would increase to $17,942 billion.

A higher fertility rate means more workers relative to beneficiaries over the projection period, thereby lowering the shortfall relative to the intermediate assumption. Table 2 demonstrates that if the ultimate total fertility rate were changed from 2.0 children per woman, the intermediate assumption, to 1.8 children per woman, the shortfall for the period of estimated OASDI income relative to cost would increase to $16,683 billion from $15,357 billion; if the ultimate rate were changed to 2.2 children per woman, the shortfall would decrease to $13,899 billion.

The annual real-wage differential is the difference between the percentage increases in: (1) the average annual wage in OASDI covered employment; and (2) the average annual Consumer Price Index (CPI). Higher real wage growth results in faster income growth relative to expenditure growth. As shown in Table 2, if the ultimate real-wage differential were changed from 1.20 percentage points, the intermediate assumption, to 0.58 percentage points, the shortfall for the period of estimated OASDI income relative to cost would increase to $17,629 billion from $15,357 billion; if the ultimate real-wage differential were changed from 1.20 to 1.82 percentage points, the shortfall would decrease to $11,928 billion.

Table 2 demonstrates that if the ultimate annual increase in the CPI were changed from 2.6 percent, the intermediate assumption, to 2.0 percent, the shortfall for the period of estimated OASDI income relative to cost would increase to $15,827 billion from $15,357 billion; if the ultimate annual increase in the CPI were changed to 3.2 percent, the shortfall would decrease to $14,876 billion. The seemingly counter-intuitive result that higher CPI increases result in decreased shortfalls (and vice versa) is explained by the time lag between the effects of the CPI changes on taxable payroll and on benefit payments. The effect on taxable payroll due to a greater increase in average wages is experienced immediately, while the effect on benefits is experienced with a lag of about one year. For this reason, larger increases in the CPI cause earnings and income to increase sooner and, therefore, by more each year, than benefits and cost.

Immigration generally occurs at relatively young adult ages, so there is no significant effect on beneficiaries (and, therefore, on benefits) in the early years of the projection period, but the effect on the numbers of workers (and, therefore, on payroll tax income) is immediate. Therefore, even in the early years, the present values, year by year, are generally higher (less negative in later years) for higher net annual immigration. However, the increased payroll taxes for a given year are eventually offset by benefits paid in that year to earlier immigrant cohorts. Therefore, the present values based on the three assumptions about net annual immigration become more similar at the end of the projection period. Table 2 shows that if the intermediate immigration assumptions were changed so that the average level for the 75-year period decreased from 1,286,000 persons to 961,000 persons, the present value of the shortfall for the period of estimated OASDI income relative to cost would increase to $16,181 billion from $15,357 billion. If, instead, the immigration assumptions were changed so that net annual immigration would be expected to average 1,623,000 persons, the present value of the shortfall would decrease to $14,620 billion.

Finally, Table 2 shows the sensitivity of the shortfall to variations in the real interest rate or, in present value terminology, the sensitivity to alternative discount rates assuming a higher discount rate results in a lower present value. If the ultimate real interest rate were changed from 2.7 percent, the intermediate assumption, to 2.2 percent, the shortfall for the

period of estimated OASDI income relative to cost, when measured in present-value terms would increase to $18,200 billion from $15,357 billion; if the ultimate annual real interest rate were changed to 3.2 percent, the present-value shortfall would decrease to $13,089 billion.

Table 2
Present Values of Estimated OASDI Expenditures in Excess of Income Under Various Assumptions, 2017-2091

(Dollar values in billions; values of assumptions shown in parentheses)

Assumption	Financing Shortfall Range		
	Low	Intermediate	High
Average annual reduction in death rates	12,976 (0.42)	15,357 (0.77)	17,942 (1.16)
Total fertility rate	13,899 (2.2)	15,357 (2.0)	16,683 (1.8)
Real wage differential	11,928 (1.82)	15,357 (1.20)	17,629 (0.58)
CPI change	14,876 (3.2)	15,357 (2.6)	15,827 (2.0)
Net immigration[1]	14,620 (1,623,000)	15,357 (1,286,000)	16,181 (961,000)
Real interest rate	13,089 (3.2)	15,357 (2.7)	18,200 (2.2)

[1] Amounts represent the average annual net immigration over the 75-year projection period.

Source: 2017 OASDI Trustees Report and SSA.

Medicare Projections

Medicare Legislation. The projections in this year's report are based on current law, with one exception related to the projected depletion of the Medicare Part A Trust Fund, and include the enactment of the *Medicare Access and CHIP Reauthorization Act of 2015* (MACRA; P.L. 114-10), which repealed the sustainable growth rate (SGR) formula that set physician fee schedule payments. While the physician payment updates and new incentives put in place by MACRA avoid the significant short-range physician payment issues that would have resulted from the SGR system approach, they nevertheless raise important long-range concerns. In particular, additional payments of $500 million per year for one group of physicians and 5-percent annual bonuses for another group are scheduled to expire in 2025, resulting in a significant one-time payment reduction for most physicians. In addition, the law specifies the physician payment update amounts for all years in the future, and these amounts do not vary based on underlying economic conditions, nor are they expected to keep pace with the average rate of physician cost increases. The specified rate updates could be an issue in years when levels of inflation are high and would be problematic when the cumulative gap between the price updates and physician costs becomes large. The gap will continue to widen throughout the projection, and it is estimated that physician payment rates under current law will be lower than they would have been under the SGR formula by 2048. Absent a change in the delivery system or level of

update by subsequent legislation, access to Medicare-participating physicians may become a significant issue in the long term under current law.

Incorporated in these projections is the sequestration of non-salary Medicare expenditures as required by the following laws:

- *Budget Control Act of 2011* (P.L. 112-25, enacted on August 2, 2011), as amended by the *American Taxpayer Relief Act of 2012* (P.L. 112-240, enacted on January 2, 2013);
- *Continuing Appropriations Resolution, 2014* (P.L. 113-67, enacted on December 26, 2013);
- Sections 1 and 3 of P.L. 113-82, enacted on February 15, 2014;
- *Protecting Access to Medicare Act of 2014* (P.L. 113-93, enacted on April 1, 2014); and
- *Bipartisan Budget Act of 2015* (P.L. 114-74, enacted on November 2, 2015).

The sequestration reduces benefit payments by 2 percent from April 1, 2013 through March 31, 2025, and by 4 percent from April 1, 2025 through September 30, 2025. Due to sequestration, non-salary administrative expenses are reduced by an estimated 5 percent from March 1, 2013 through September 30, 2025.

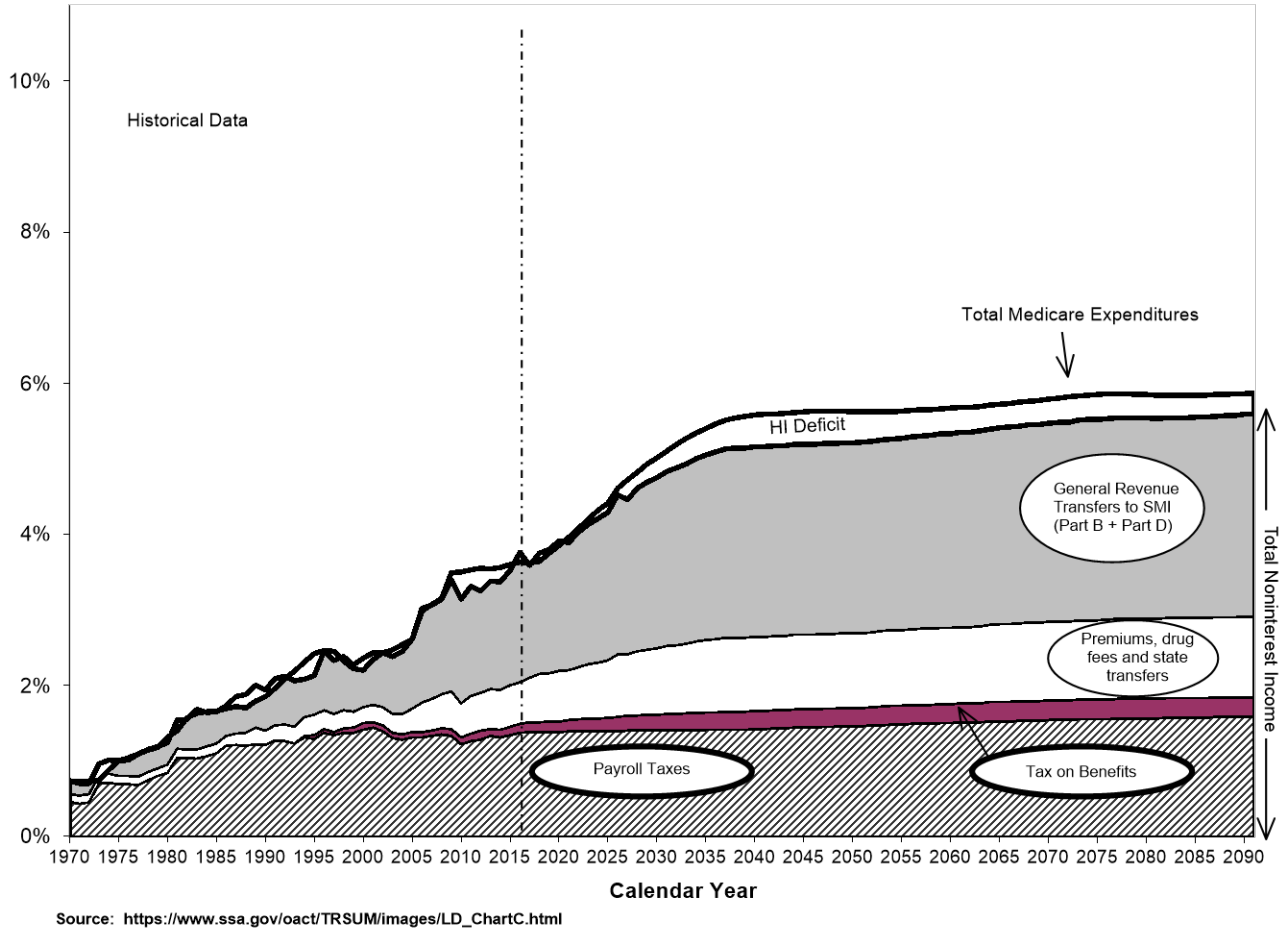
These projections also incorporate the effects of the *Patient Protection and Affordable Care Act*, as amended by the *Health Care and Education Reconciliation Act of 2010*. This legislation, referred to collectively as the *Affordable Care Act* or ACA, contains roughly 165 provisions affecting the Medicare program by reducing costs, increasing revenues, improving benefits, combating fraud and abuse, and initiating a major program of research and development to identify alternative provider payment mechanisms, health care delivery systems, and other changes intended to improve the quality of health care and reduce costs.

The 2017 Medicare Trustees' Report warns that the financial projections for the Medicare program reflect substantial, but very uncertain, cost savings deriving from provisions of the ACA and MACRA that lower increases in Medicare payment rates to most categories of health care providers. Without fundamental change in the current delivery system, these adjustments would probably not be viable indefinitely. It is conceivable that providers could improve their productivity, reduce wasteful expenditures, and take other steps to keep their cost growth within the bounds imposed by the Medicare price limitations. For such efforts to be successful in the long range, however, providers would have to generate and sustain unprecedented levels of productivity gains—a very challenging and uncertain prospect. In view of the factors described above, it is important to note that Medicare's actual future costs are highly uncertain for reasons apart from the inherent challenges in projecting health care cost growth over time.

Changes in Projection Methods. The projections in this year's report, with one exception related to Part A, are based on current law; that is, it is assumed that laws on the books will be implemented and adhered to with respect to scheduled taxes, premium revenues, and payments to providers and health plans. The one exception is that the projections disregard payment reductions that would result from the projected depletion of the Medicare Hospital Insurance (HI) Trust Fund. Under current law, payments would be reduced to levels that could be covered by incoming tax and premium revenues when the HI Trust Fund was depleted.

Total Medicare. Chart 5 shows expenditures and current-law noninterest revenue sources for HI and SMI combined as a percentage of GDP. For 2017, total Medicare expenditures are expected to exceed noninterest revenue, but by only a very small margin, and modest surpluses are projected to continue for 2018 through 2020. Deficits are expected to return in 2021 and to remain for the balance of the projection, as expenditures grow faster than revenue. Under the ACA, beginning in 2013 the HI Trust Fund receives an additional 0.9 percent tax on earnings in excess of $250,000 for joint tax return filers and $200,000 for individual tax return filers. As a result of this provision, it is projected that payroll taxes will grow slightly faster than GDP. HI revenue from income taxes on Social Security benefits will gradually increase as a share of GDP as the share of benefits subject to such taxes increases. Beginning in 2009, as HI payroll tax receipts declined due to the recession and general revenue transfers increased, the latter income source became the largest single source of income to the Medicare program as a whole. General revenue transfers to the Part B account increased significantly in 2016, as required by the *Bipartisan Budget Act* (BBA) of 2015 to compensate for premium revenue that was not received in 2016 due to the hold harmless provision, which limited the Part B premium increase for a majority of beneficiaries. After decreasing from 2016 to 2017, general revenues will gradually increase as a share of Medicare financing from 2017 through 2029 and grow to about 48 percent by 2030, stabilizing thereafter. SMI premiums will also grow in proportion to general revenue transfers, placing a growing burden on beneficiaries. For high-income enrollees, SMI premiums began to increase more rapidly in 2011 and will continue to do so as a result of ACA provisions that increase Part D premiums and freeze the income thresholds used to determine Part B and Part D income-related premiums for 2011-2019. MACRA contains further provisions that affect the income-related premium thresholds and that will result in more premium income to Part B and Part D. SMI general revenues currently equal 1.5 percent of GDP and will increase to an estimated 2.7 percent in 2091 under current law.

Chart 5—Total Medicare (HI and SMI) Expenditures and Noninterest Income as a Percent of GDP 1970-2091

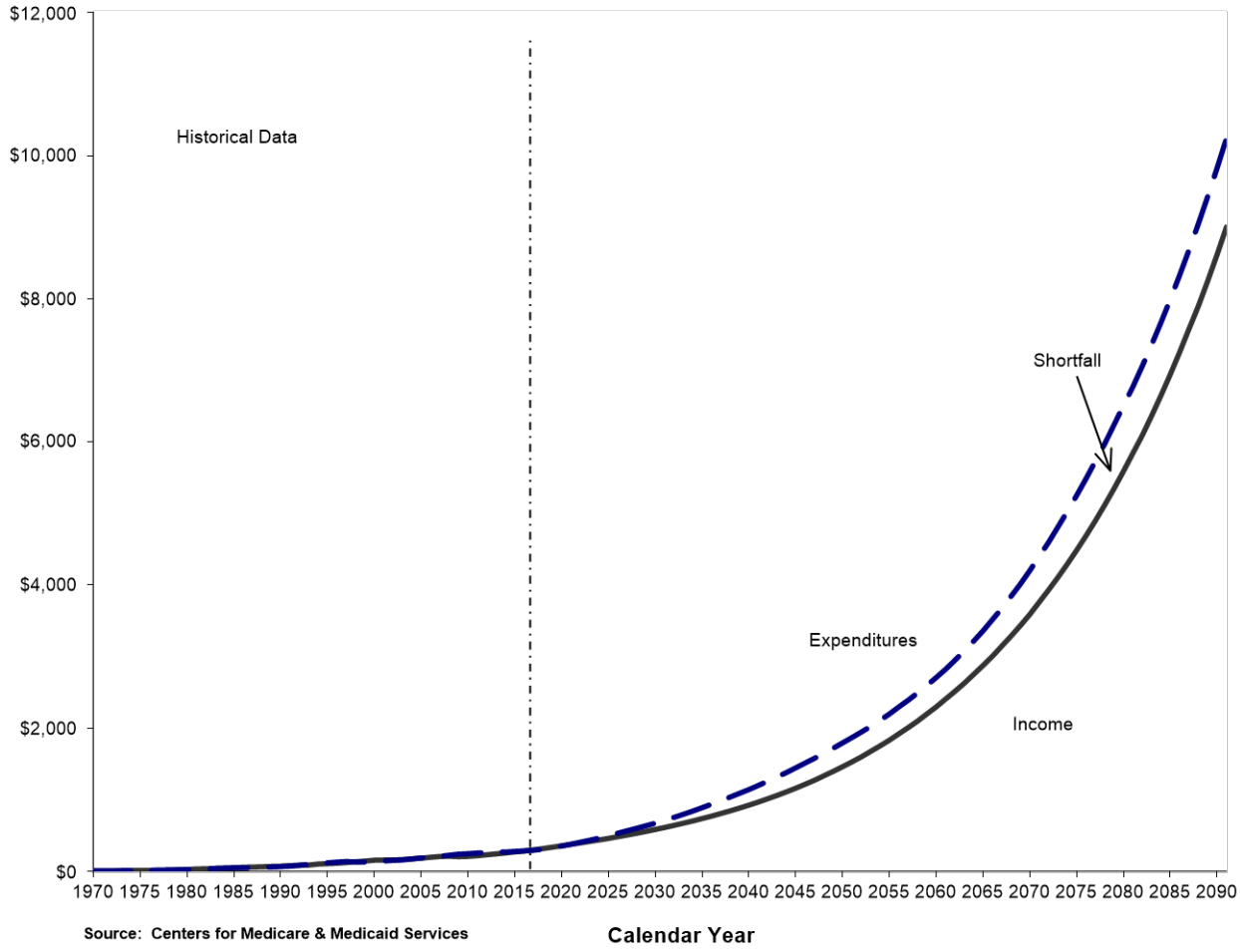


Source: https://www.ssa.gov/oact/TRSUM/images/LD_ChartC.html

Medicare, Part A (Hospital Insurance)— Income and Expenditures. Chart 6 shows historical and actuarial estimates of HI annual income (excluding interest) and expenditures for 1970-2091 in nominal dollars. The estimates are for the open-group population.

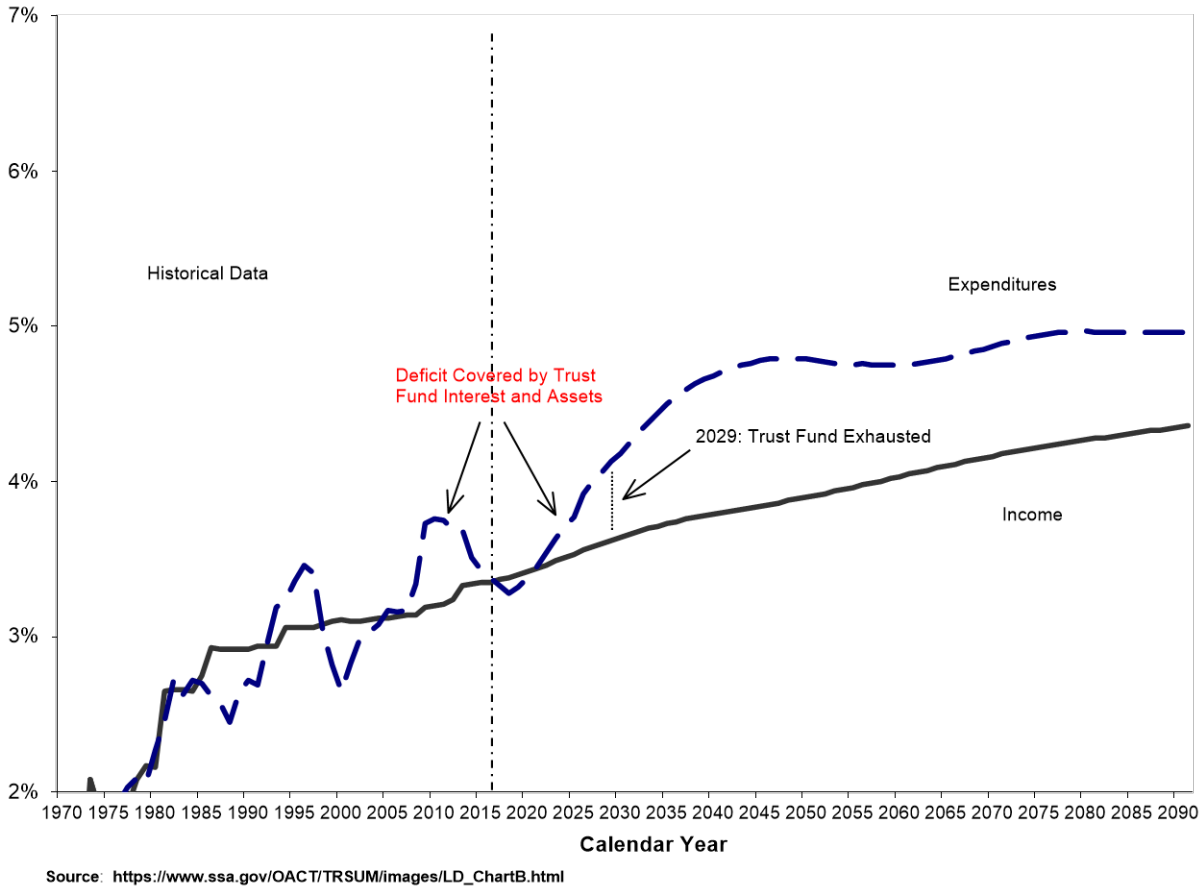
Chart 6—Medicare Part A Income (Excluding Interest) and Expenditures 1970-2091

(In billions of dollars)



Medicare, Part A Income and Expenditures as a Percent of Taxable Payroll. Chart 7 illustrates income (excluding interest) and expenditures as a percentage of taxable payroll over the next 75 years. The projected HI cost rates shown in the 2017 report are lower than those from the 2016 report for all years largely due to lower utilization assumptions for inpatient hospital services, which were primarily based on lower-than-expected utilization in 2016. Since the standard HI payroll tax rates are not scheduled to change in the future under present law, most payroll tax income as a percentage of taxable payroll is estimated to remain constant at 2.90 percent. In addition, starting in 2013, high-income workers pay an additional 0.9 percent of their earnings above $200,000 (for single workers) or $250,000 (for married couples filing joint income tax returns). Because these income thresholds are not indexed, over time an increasing proportion of workers will become subject to the additional HI tax rate, and consequently total HI payroll tax revenues will increase steadily as a percentage of taxable payroll. Income from taxation of benefits will also increase as a greater proportion of Social Security beneficiaries become subject to such taxation, since the income thresholds determining taxable benefits are not indexed for price inflation. Thus, as Chart 7 shows the income rate is expected to gradually increase over current levels. As indicated in the chart, the cost rate is projected to decline through 2018, largely due to (i) expenditure growth that was constrained in part by low utilization and low payment updates, and (ii) a rebound of taxable payroll growth from 2007-2009 recession levels. After 2018 the cost rate is projected to rise primarily due to retirements of those in the baby-boom generation and partly due to a projected return to modest health services cost growth. This cost rate increase is moderated by the accumulating effect of the productivity adjustments to provider price updates, which are estimated to reduce annual HI per capita cost growth by an average of 0.8 percent through 2026 and 1.1 percent thereafter. The percentage of expenditures covered by noninterest income is projected to decrease from 88 percent in 2029, the year the HI Trust Fund is projected to be depleted, to 81 percent in 2041, and then to increase to about 88 percent again by the end of the projection period.

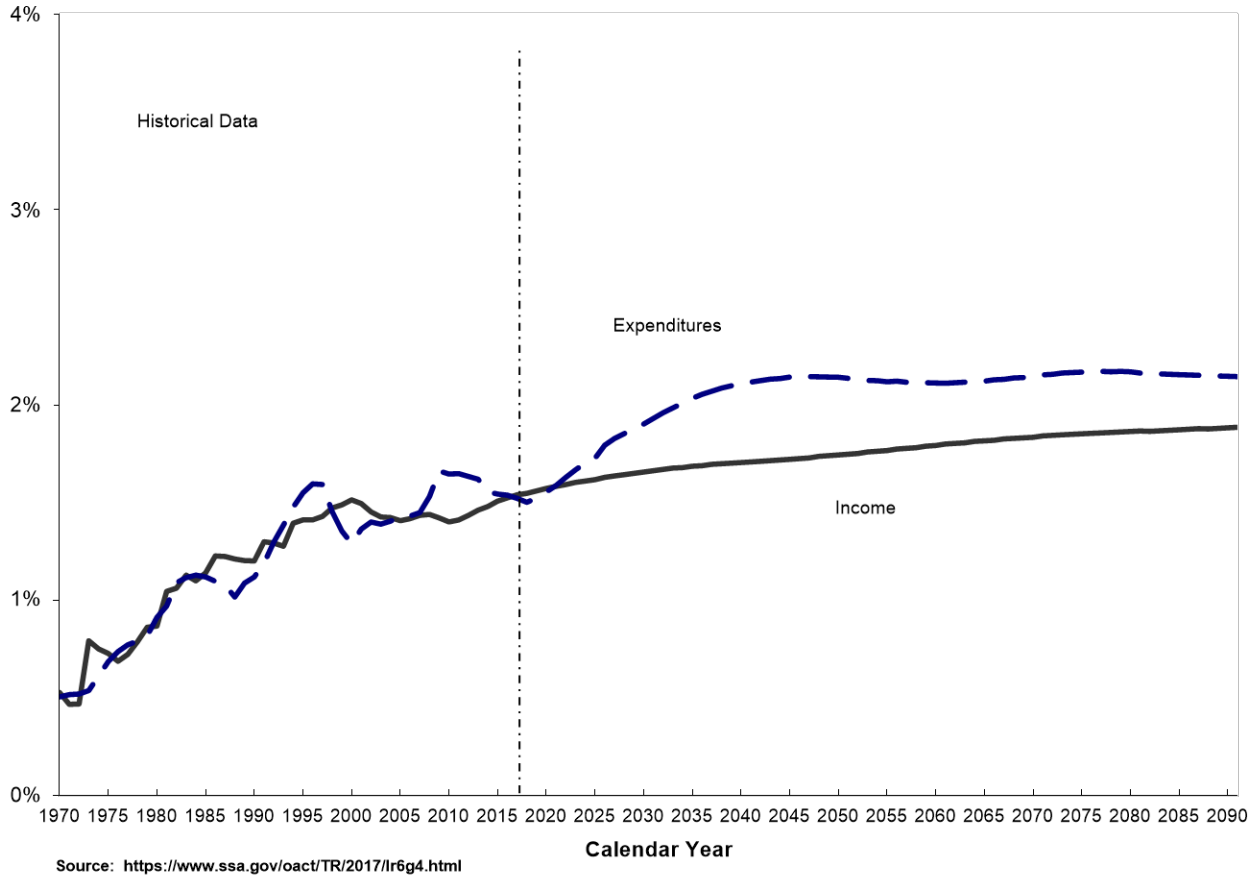
Chart 7—Medicare Part A Income (Excluding Interest) and Expenditures as a Percent of Taxable Payroll 1970-2091



Source: https://www.ssa.gov/OACT/TRSUM/images/LD_ChartB.html

Medicare, Part A Income and Expenditures as a Percent of GDP. Chart 8 shows estimated annual noninterest income and expenditures, expressed as percentages of GDP, the total value of goods and services produced in the United States. This alternative perspective shows the size of the HI Program in relation to the capacity of the national economy to sustain it. Under the intermediate assumptions, the HI balance is positive for 2017 through 2020, and then negative thereafter. Annual deficits increase through 2045, and then generally decline thereafter. The gap between expenditure and income shares of GDP widens to 0.42 percent in 2045, and then commences a slight decline, reaching 0.26 percent of GDP in 2091.

Chart 8—Medicare Part A Income (Excluding Interest) and Expenditures as a Percent of GDP 1970-2091

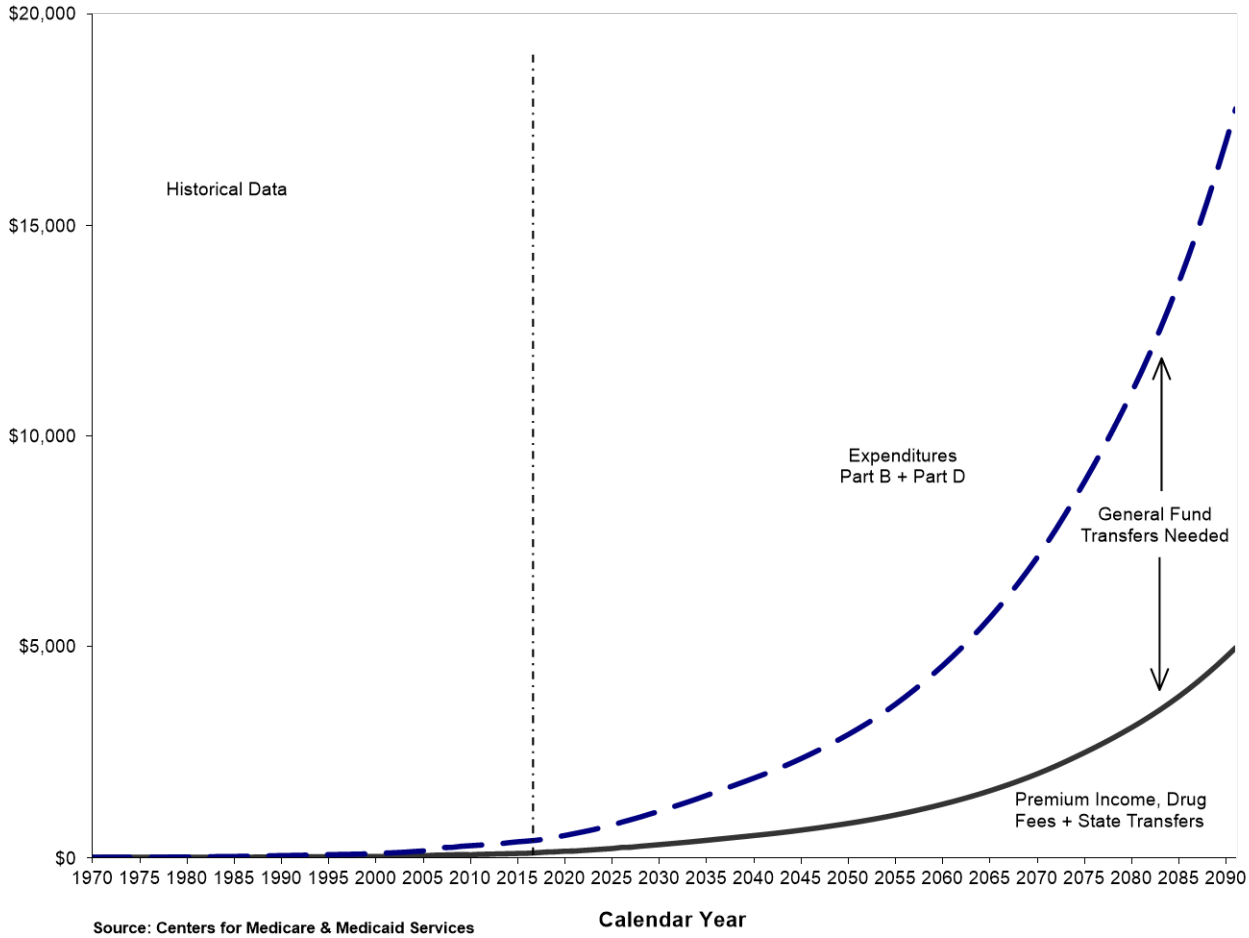


Source: https://www.ssa.gov/oact/TR/2017/lr6g4.html

Medicare, Parts B and D (Supplementary Medical Insurance). Chart 9 shows historical and actuarial estimates of Medicare Part B and Part D premiums (and Part D state transfers) as well as expenditures for each of the next 75 years, in dollars. Beneficiary premiums and general revenue contributions for both Part B and Part D are established annually to cover the expected costs for the upcoming year. Should actual costs exceed those anticipated when the financing is determined, future financing rates can include adjustments to recover the shortfall. Likewise, should actual costs be less than those anticipated, the savings would result in lower future financing rates. The gap between program expenditures and revenues from premiums, drug fees, and state transfers grows throughout the projection period. This gap will need to be filled with general revenue transfers.

Chart 9—Medicare Part B and Part D Premium and State Transfer Income and Expenditures 1970-2091

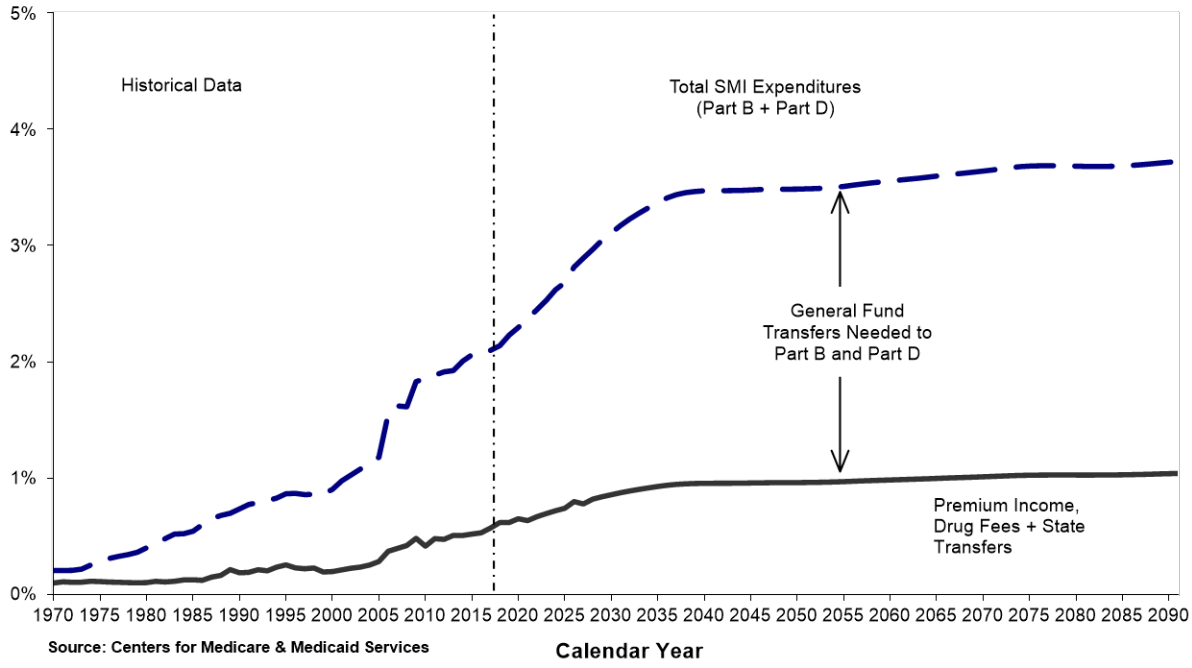
(In billions of dollars)



Source: Centers for Medicare & Medicaid Services

Medicare Part B and Part D Premium as well as State Transfer Income and Expenditures as a Percent of GDP. Chart 10 shows expenditures for the Supplementary Medical Insurance Program over the next 75 years expressed as a percentage of GDP, providing a perspective on the size of the SMI Program in relation to the capacity of the national economy to sustain it. SMI costs are projected to continue to outpace growth in GDP but at a slower rate compared to the last 10 years. Total SMI expenditures amounted to 2.1 percent of GDP in 2016 and are projected to grow to about 3.5 percent of GDP within 25 years and to 3.7 percent by the end of the projection period. The relatively high growth during the period 2017-2026 is due to the continuing retirement of the baby-boom generation, further economic recovery, and modest increases in cost trends. Growth rates are projected to decline during the 2027-2041 period primarily as a result of a deceleration in beneficiary population growth. For the last 50 years of the projection period, cost growth moderates further due to the continued deceleration in beneficiary population growth and lower health care cost growth rate assumptions. To match the faster growth rates for SMI expenditures, beneficiary premiums, along with general revenue contributions, would increase more rapidly than GDP over time but at a slower rate compared to the last 10 years. Average per beneficiary costs for Part B and Part D benefits are projected to increase after 2016 by about 4.2 percent annually. The associated beneficiary premiums—and general revenue financing—would increase by approximately the same rate.

Chart 10—Medicare Part B and Part D Premium and State Transfer Income and Expenditures as a Percent of GDP 1970-2091



Medicare Sensitivity Analysis. This section illustrates the sensitivity of long-range cost and income estimates for the Medicare Program to changes in *selected individual assumptions*. As with the OASDI analysis, the intermediate assumption is used as a reference point, and each selected assumption is varied individually to produce three scenarios. The variation used for each individual assumption reflects the levels used for that assumption in the low-cost and high-cost projections (see description of sensitivity analysis for OASDI). All present values are calculated as of January 1, 2017 and are based on estimates of income and expenditures during the 75-year projection period.

Table 3 shows the net present value of cash flow during the 75-year projection period under three alternative assumptions for the annual growth rate in the aggregate cost of providing covered health care services to beneficiaries. These assumptions are that the ultimate annual growth rate in such costs, relative to taxable payroll, will be 1 percent slower than the intermediate assumptions, the same as the intermediate assumptions, and 1 percent faster than the intermediate assumptions. The assumptions are shown in parentheses. The table demonstrates that if the ultimate growth rate assumption is 1 percentage point lower than the intermediate assumption, the deficit decreases by $7,194 billion. On the other hand, if the ultimate growth rate assumption is 1 percentage point higher than the intermediate assumption, the deficit increases

substantially by $11,496 billion. This assumption has a dramatic impact on projected HI cash flow. The present value of the net cash flow under the ultimate growth rate assumption of 1 percentage point lower than the intermediate assumption actually becomes a surplus due to the improved financial outlook for the HI trust fund as a result of the ACA. Several factors, such as the utilization of services by beneficiaries or the relative complexity of services provided, can affect costs without affecting tax income. As the table indicates, the financial status of the HI Trust Fund is extremely sensitive to the relative growth rates for health care service costs.

The fertility rate assumption has a substantial impact on projected HI cash flows. As demonstrated by Table 3, for an increase of 0.2 in the assumed ultimate fertility rate, the projected present value of the HI deficit decreases by approximately $537 billion, and for a decrease of 0.2 in the assumed ultimate fertility rate, the projected present value of the HI deficit increases by approximately $486 billion. Under the higher fertility rate assumptions, there will be additional workers in the labor force after 20 years, and many will become subject to the additional HI tax, thereby lowering the deficit proportionately more on a present-value-dollar basis. On the other hand, under the lower fertility rate assumptions, there will be fewer workers in the workforce with a smaller number subject to the additional tax, in turn raising the HI deficit. It is important to point out that if a longer projection period were used, the impact of a fertility rate change would be more pronounced.

Relative to the intermediate case, for an increase in the ultimate real-wage differential assumption of 0.6 percentage points, the deficit—expressed in present-value dollars—decreases by approximately $2,397 billion. Conversely, for a decrease in the ultimate real-wage differential assumption of 0.6 percentage points, the deficit increases by about $1,429 billion. When expressed in present-value dollars, faster real-wage growth results in smaller HI cash flow deficits. A higher real-wage differential immediately increases both HI expenditures for health care and wages for all workers. There is a full effect on wages and payroll taxes, but the effect on benefits is only partial, since not all health care costs are wage-related. In practice, faster real-wage growth always improves the financial status of the HI trust fund, regardless of whether there is a small or large imbalance between income and expenditures.

As Table 3 indicates, the change in CPI inflation has an impact when the cash flow is expressed as present values. If the ultimate CPI-increase assumption is changed from 2.6 percent, the intermediate assumption, to 3.2 percent, the deficit decreases by $1,038 billion. On the other hand, if the ultimate CPI-increase is changed from 2.6 percent, the intermediate assumption, to 2.0 percent, the deficit increases by $1,320 billion. The projected present values of HI cash flow are relatively insensitive to the assumed level of general price inflation because price inflation has about the same proportionate effect on income as it does on costs. In present value terms, a smaller deficit results under high-inflation conditions because the present values of HI expenditures are not significantly different under the various CPI scenarios, but under high-inflation conditions the present value of HI income increases as more people become subject to the additional 0.9-percent HI tax rate required by the ACA for workers with earnings above $200,000 or $250,000 (for single and joint income-tax filers, respectively). Since the thresholds are not indexed, additional workers become subject to the additional tax more quickly under conditions of faster inflation, and vice versa.

Higher net immigration results in smaller HI cash flow deficits. Since immigration tends to occur most often among people at working ages, who work and pay taxes into the HI system, a change in the net immigration assumption affects revenues from payroll taxes almost immediately. However, the impact on expenditures occurs later as those individuals age and become beneficiaries.

Table 3 also shows that the present value of net HI expenditures is approximately 15 percent lower if the real interest rate is 3.2 percent rather than 2.7 percent, and approximately 19 percent higher if the real interest rate is 2.2 percent rather than 2.7 percent.

Table 3
Present Values of Estimated Medicare Part A Expenditures in Excess of Income Under Various Assumptions, 2017-2091

(Dollar values in billions; values of assumptions shown in parentheses)

Assumption[1]	Financing Shortfall Range		
	Low	Intermediate	High
Average annual growth in health costs[2]	(3,662) (2.7)	3,532 (3.7)	15,028 (4.7)
Total fertility rate[3]	2,995 (2.2)	3,532 (2.0)	4,018 (1.8)
Real wage differential	1,135 (1.8)	3,532 (1.2)	4,961 (0.6)
CPI change	2,494 (3.2)	3,532 (2.6)	4,852 (2.0)
Net immigration[4]	3,240 (1,623,000)	3,532 (1,286,000)	3,879 (961,000)
Real interest rate	3,006 (3.2)	3,532 (2.7)	4,197 (2.2)

[1] The sensitivity of the projected HI net cash flow to variations in future mortality rates also is of interest. At this time, however, relatively little is known about the relationship between improvements in life expectancy and the associated changes in health status and per beneficiary health expenditures. As a result, it is not possible at present to prepare meaningful estimates of the Part A, mortality sensitivity.

[2] Annual growth rate is the aggregate cost of providing covered health care services to beneficiaries. The low-cost and high-cost alternatives assume that costs increase 1 percent slower or faster, respectively, than the intermediate assumption, relative to growth in taxable payroll.

[3] The total fertility rate for any year is the average number of children who would be born to a woman in her lifetime if she were to experience the birth rates by age observed in, or assumed for, the selected year and if she were to survive the entire childbearing period.

[4] Amount represents the average annual net immigration over the 75-year projection period.

Source: Center for Medicare & Medicaid Services

Table 4 shows the effects of various assumptions about the growth in health care costs on the present value of estimated SMI (Medicare Parts B and D) expenditures in excess of income. As with HI, net SMI expenditures are very sensitive to changes in the health care cost growth assumption. For the low-cost alternative, the slower assumed growth in health costs reduces the governmentwide resources needed for Part B from $22,392 billion to $16,220 billion and in Part D from $7,618 billion to $5,388 billion, about a 28 percent and 29 percent difference for Part B and Part D, respectively. The high-cost assumption increases governmentwide resources needed to $32,019 billion for Part B and to $11,170 billion for Part D, about a 43 percent and a 47 percent difference for Part B and Part D, respectively.

Table 4
Present Values of Estimated Medicare Parts B and D Future Expenditures Less Premium Income and State Transfers Under Three Health Care Cost Growth Assumptions, 2017-2091

(In billions of dollars)

Medicare Program[1]	Governmentwide Resources Needed		
	Low (3.3)	Intermediate (4.3)	High (5.3)
Part B	16,220	22,392	32,019
Part D	5,388	7,618	11,170

[1] Annual growth rate is the aggregate cost of providing covered health care services to beneficiaries. The low and high scenarios assume that costs increase one percent slower or faster, respectively, than the intermediate assumption.

Source: Centers for Medicare & Medicaid Services

Sustainability of Social Security and Medicare

75-Year Horizon

According to the 2017 Medicare Trustees Report, the HI Trust Fund is projected to remain solvent until 2029 and, according to the 2016 Social Security Trustees Report, the OASI and DI Trust Funds are projected to have sufficient asset reserves to pay full benefits on time until 2035 and 2028, respectively. In each case, some general revenues must be used to satisfy the authorization of full benefit payments until the year of trust fund depletion. This occurs when the trust fund interest income and balances accumulated during prior years are needed to pay benefits, which leads to a transfer from general revenues to the trust funds. Moreover, under current law, General Fund transfers to the SMI Trust Fund will occur into the indefinite future and will continue to grow with the growth in health care expenditures.

The potential magnitude of future financial obligations under these three social insurance programs is, therefore, important from a budget perspective as well as for understanding generally the growing resource demands of the programs on the economy. A common way to present future cash flows is in terms of their *present value*. This approach recognizes that a dollar paid or collected next year is worth less than a dollar today because a dollar today could be saved and earn a year's worth of interest. From the 75-year budget perspective, the present value of the additional resources that would be necessary to meet projected expenditures, for the three programs combined, is $48.9 trillion. To put this figure in perspective, it would represent 3.9 percent of the present value of projected GDP over the same period ($1,250 trillion). These resource needs would be in addition to the payroll taxes, benefit taxes, and premium payments. Asset redemptions and SMI general revenue transfers represent formal budget commitments, but no provision exists for covering the HI and OASDI Trust Fund deficits once assets are depleted.

Table 5 shows the magnitudes of the primary expenditures and sources of financing for the three trust funds computed on an open-group basis for the next 75 years and expressed in present values. The data are consistent with the Statements of Social Insurance included in the principal financial statements. For HI, revenues from the public are projected to fall short of total expenditures by $3,532 billion in present value terms which is the additional amount needed in order to pay scheduled benefits over the next 75 years.[14] From the trust fund perspective, the amount needed is $3,333 billion in present value after subtracting the value of the existing trust fund balances (an asset to the trust fund account but an intragovernmental transfer to the overall budget). For SMI, revenues from the public for Part B and D combined are estimated to be $30,010 billion less than total expenditures for the two accounts, an amount that, from a budget perspective, will be needed to keep the SMI program solvent for the next 75 years. From the trust fund perspective, however, the present values of total revenues and total expenditures for the SMI Program are roughly equal due to the annual adjustment of revenue from other Government

[14] Interest income is not a factor in this table as dollar amounts are in present value terms.

accounts to meet program costs.[15] For OASDI, projected revenues from the public fall short of total expenditures by $15,357 billion in present value dollars, and by $12,509 billion from the trust fund perspective.

From the governmentwide perspective, the present value of the total resources needed for the Social Security and Medicare Programs over and above current-law funding sources (payroll taxes, benefit taxes, and premium payments from the public) is $48,898 billion. From the trust fund perspective, which counts the trust funds ($3,143 billion in present value) and the general revenue transfers to the SMI Program ($30,010 billion in present value) as dedicated funding sources, additional resources needed to fund the programs are $15,745 billion in present value.

Table 5
Present Values of Costs Less Revenues of 75-Year Open Group Obligations
HI, SMI, and OASDI

		SMI			
(In billions of dollars, as of January 1, 2017)	HI	Part B	Part D	OASDI	Total
Revenues from the public:					
Taxes	21,738	-	-	62,131	83,869
Premiums and state transfers	-	8,391	3,138	-	11,529
Total	21,738	8,391	3,138	62,131	95,398
Total costs to the public	25,270	30,783	10,756	77,487	144,296
Net results - budget perspective[1]	3,532	22,392	7,618	15,357	48,898
Revenues from other Government accounts	-	22,392	7,618	-	30,010
Trust fund balances as of 1/1/2017	199	88	8	2,848	3,143
Net results - trust fund perspective[1]	3,333	(88)	(8)	12,509	15,745

[1]Net results are computed as costs less revenues and trust fund balances. Negative values are indicative of surpluses.

Note: Totals may not equal the sum of components due to rounding.

Source: 2017 OASDI and Medicare Trustees' Reports

Infinite Horizon

The 75-year horizon represented in Table 5 is consistent with the primary focus of the Social Security and Medicare Trustees' Reports. For the OASDI Program, for example, an additional $15.4 trillion in present value will be needed above currently scheduled taxes to pay for scheduled benefits ($12.5 trillion from the trust fund perspective). Experts have noted that limiting the projections to 75 years understates the magnitude of the long-range unfunded obligations because summary measures (such as the actuarial balance and open-group unfunded obligations) reflect the full amount of taxes paid by the next two or three generations of workers, but not the full amount of their benefits. One approach to addressing the limitations of 75-year summary measures is to extend the projection horizon indefinitely, so that the overall results reflect the projected costs and revenues after the first 75 years. Such extended projections can also help indicate whether the financial imbalance would be improving or continuing to worsen beyond the normal 75-year period. The open-group infinite horizon net obligation is the present value of all expected future program outlays less the present value of all expected future program tax and premium revenues. Such a measure is provided in Table 6 for the three trust funds represented in Table 5.

From the budget or governmentwide perspective, the values in line 1 plus the values in line 4 of Table 6 represent the value of resources needed to finance each of the programs into the infinite future. The sums are shown in the last line of the table (also equivalent to adding the values in the second and fifth lines). The total resources needed for all the programs sums to $93.8 trillion in present value terms. This need can be satisfied only through increased borrowing, higher taxes, reduced program spending, or some combination.

[15] The SMI Trust Fund has $96 billion of existing assets.

The second line shows the value of the trust fund at the beginning of 2017. For the HI and OASDI Programs this represents, from the trust fund perspective, the extent to which the programs are funded. From that perspective, when the trust fund is subtracted, an additional $34.2 trillion is needed to sustain the OASDI program into the infinite future, while the HI program reflects a projected surplus of $3.6 trillion over the infinite horizon. However, looking just at present values ignores timing differences in the underlying projected cash flows; the HI Trust Fund is projected to remain solvent only until 2029. As described above, from the trust fund perspective, the SMI Program is fully funded; from a governmentwide basis, the substantial gap that exists between premiums, state transfer revenue, and program expenditures in the SMI Program ($41.3 trillion and $18.7 trillion for Parts B and D, respectively) represents future general revenue obligations of the federal budget.

In comparison to the analogous 75-year number in Table 5, extending the calculations beyond 2091, captures the full lifetime benefits, plus taxes and premiums of all current and future participants. The shorter horizon understates the total financial needs by capturing relatively more of the revenues from current and future workers and not capturing all of the benefits that are scheduled to be paid to them.

Table 6
Present Values of Costs Less Tax, Premium and State Transfer Revenue through the Infinite Horizon, HI, SMI, OASDI

(in trillions of dollars as of January 1, 2017)	HI	SMI		OASDI	Total
		Part B	Part D		
Present value of future costs less future taxes, premiums, and state transfers for current participants	10.6	18.7	5.6	33.6	68.5
Less current trust fund balance	0.2	0.1	-	2.8	3.1
Equals net obligations for past and current participants	10.4	18.6	5.6	30.8	65.4
Plus net obligations for future participants	(13.9)	22.7	13.1	3.4	25.3
Equals net obligations through the infinite future for all participants	(3.6)	41.3	18.7	34.2	90.6
Present values of future costs less the present values of future income over the infinite horizon	(3.3)	41.4	18.7	37.0	93.8

Note: Totals may not equal the sum of components due to rounding.

Source: 2017 OASDI and Medicare Trustees' Reports

Railroad Retirement, Black Lung, and Unemployment Insurance

Railroad Retirement

The Railroad Retirement Board (RRB) was created in the 1930s to establish a retirement benefit program for the Nation's railroad workers. As the Social Security Program legislated in 1935 would not give railroad workers credit for service performed prior to 1937, legislation was enacted in 1934, 1935, and 1937 (collectively the Railroad Retirement Acts of the 1930s) to establish a railroad retirement system separate from the Social Security Program.

As was discussed previously in this report, railroad retirement pays full retirement annuities at age 60 to railroad workers with 30 years of service. The program pays disability annuities based on total or occupational disability. It also pays annuities to spouses, divorced spouses, widow(er)s, remarried widow(er)s, surviving divorced spouses, children, and parents of deceased railroad workers. Medicare covers qualified railroad retirement beneficiaries in the same way as it does Social Security beneficiaries.

Payroll taxes paid by railroad employers and their employees provide a primary source of income for the Railroad Retirement and Survivors' Benefit Program. Other sources of program income include: the RRB-SSA-CMS Financial Interchanges with the Social Security and Medicare Trust Funds, earnings on investments, federal income taxes on railroad retirement benefits, and appropriations.

For further detail related to Railroad Retirement Program financing and actuarial assumptions, see Note 22—Social Insurance.

Cash Flow Projections

Income and Expenditures. Railroad retirement cash flow projections are based on the intermediate set of assumptions used in the RRB's actuarial valuation of the program. The estimates are for the open-group population, which includes all persons projected to participate in the Railroad Retirement Program as railroad workers or beneficiaries during the period. Thus, the estimates include payments from, and on behalf of, those who will be employed by the railroads during the period as well as those already employed at the beginning of the period. They also include expenditures made to, and on behalf of, such workers during that period. Estimated railroad retirement expenditures are expected to exceed estimated income (excluding interest and financial interchange income), in dollars, for the entire projection period (2017-2091).

Income and Expenditures as a Percent of Taxable Payroll. Estimated expenditures as a percentage of Tier II taxable payroll range between 68 percent and 72 percent through 2057, after which the percentage decreases until reaching 52 percent in 2088 through 2091. This is largely due to the projected decline in the number of annuitants per full-time employee.

Sensitivity Analysis. The projections of the future financial status of the Railroad Retirement Program depend on many economic and demographic assumptions. For further information on the sensitivity of the long-range projections of the Railroad Retirement Program and how the projections are impacted by changes in certain key assumptions, refer to RRB's financial statements.

Sustainability of Railroad Retirement

Consistent with the Statements of Social Insurance the primary expenditures and sources of financing for the Railroad Retirement Program are computed on an open-group basis for the next 75 years and are expressed in present values as of October 1, 2016. From a governmentwide perspective, revenues are expected to fall short of expenditures by approximately $108.9 billion, which represents the present value of resources needed to sustain the Railroad Retirement Program. From a trust fund perspective, when the trust fund balance ($26.6 billion) and the financial interchange and transfers ($84.0 billion) are included, the combined balance of the NRRIT, the Railroad Retirement Account, and the SSEB Account show a slight surplus ($1.7 billion). For further detail related to the sustainability of the Railroad Retirement Program, refer to RRB's financial statements.

Black Lung

The Federal Coal Mine Health and Safety Act of 1969 created the Black Lung Disability Benefit Program to provide compensation, medical, and survivor benefits for eligible coal miners who are totally disabled due to pneumoconiosis (black lung disease) arising out of their coal mine employment and the Black Lung Disability Trust Fund (BLDTF) provides benefit payments when no responsible mine operator (RMO) can be assigned the liability.

As was stated in the note to Social Insurance earlier in this report, black lung disability benefit payments are funded by excise taxes from coal mine operators based on the domestic sale of coal, as are the program's administrative costs. These taxes are collected by the Internal Revenue Service (IRS) and transferred to the BLDTF.

P.L. 110-343, *Division B-Energy Improvement and Extension Act of 2008*, enacted on October 3, 2008, in section 113, (1) allowed for the temporary increase in coal excise tax rates to continue an additional five years beyond the statutory limit and (2) restructured the BLDTF debt by refinancing the outstanding repayable advances (which had higher interest rates) with discounted debt instruments similar in form to zero-coupon bonds (which had lower interest rates), plus a one-time appropriation. This Act also allowed that any subsequent debt issued by the BLDTF may be used to make benefit payments, other authorized expenditures, or to repay debt and interest from the initial refinancing. All debt issued by the BLDTF was effected as borrowing from the Treasury's Bureau of the Fiscal Service.

For more information on Black Lung Disability Benefit Program financing and actuarial assumptions, see Note 22—Social Insurance.

Cash Flow Projections

Projected Cash Inflows and Outflows, in Constant Dollars, for the Open Group. Effective for fiscal year 2017 reporting, DOL revised its projection period from a fixed terminus of fiscal year 2040 to a rolling 25-year period beginning on the valuation date. In order to be consistent with Executive Branch policy on regulations pursuant to the Clean Power Plan (CPP), DOL's estimates of future excise tax income were based on Energy Information Administration (EIA) projections of future coal production that do not reflect CPP regulation. The EIA projections reflect the continuing trend of lower coal production which would lead to lower future excise tax income. The projections, in constant dollars for the open group, made over the 25-year period ending September 30, 2042, indicate that cash inflows from excise taxes will exceed cash outflows for benefit payments and administrative expenses for fiscal years 2018 and 2019, but cash outflows will exceed cash inflows for fiscal years 2020 through 2032 before reversing again in fiscal year 2033.

Sensitivity Analysis. For the projected cash inflows and outflows with sensitivity analysis, in constant dollars for the open group, the significant assumption for medical cost inflation was increased by one percent. For the sensitivity analysis, the other significant assumptions (coal excise tax revenue estimates, tax rate structure, number of beneficiaries, life expectancy, federal civilian pay raises, interest rate on new debt issued by the BLDTF, and CPI-U for goods and services) were left unchanged. Cash projections depend on the assumptions used and actual experience may differ materially from the projections. These projections with sensitivity analysis, in constant dollars for the open group, made over the 25-year period ending September 30, 2042, indicate that cash inflows from excise taxes will exceed cash outflows for benefit payments and administrative expenses for fiscal years 2018 and 2019, but cash outflows exceed cash inflows for fiscal years 2020 through 2033 before reversing again in fiscal year 2034. For further information on the sensitivity of the projections of the Black Lung Disability Benefit Program and how the projections are impacted by changes in assumptions, refer to DOL's financial statements.

Sustainability of Black Lung

On September 30, 2017, total liabilities of the BLDTF exceeded assets by $5.6 billion. This net position represents the accumulated shortfall of excise taxes necessary to meet benefit payments, administrative costs, and interest expense incurred prior to and subsequent to the debt refinancing pursuant to P.L. 110-343. Prior to the enactment of P.L. 110-343, this shortfall was funded by repayable advances to the BLDTF, which were repayable with interest. Pursuant to P.L. 110-343, any shortfall will be financed with debt instruments similar in form to zero-coupon bonds, with a maturity date of one year and bear interest at the Treasury 1-year rate. For further detailed information on the sustainability of the Black Lung Disability Benefit Program, refer to DOL's financial statements.

Unemployment Insurance

The Unemployment Insurance (UI) Program was created in 1935 to provide income assistance to unemployed workers who lose their jobs generally through no fault of their own, and are unemployed due to a lack of suitable work. The program protects workers during temporary periods of unemployment through the provision of unemployment compensation benefits. The program is administered through a unique system of federal and state partnerships established in federal law but executed through conforming state laws by state agencies. The federal government provides broad policy guidance and program

direction through the oversight of DOL, while program details are established through individual state UI statutes, administered through state UI agencies.

The UI Program is financed through the collection of federal and state unemployment taxes levied on subject employers and deposited in the Unemployment Trust Fund (UTF) and federal appropriations. The fund was established to account for the receipt, investment, and disbursement of unemployment taxes. Federal unemployment taxes are used to pay for the administrative costs of the UI Program, including grants to each state to cover the costs of state UI operations and the federal share of extended UI benefits. Federal unemployment taxes are also used to fund an account within the UTF to make advances to state UI accounts when a state's UI account balance has been exhausted and the state is unable to make benefit payments.

The UI Program provides regular and extended benefit payments to eligible unemployed workers. Regular UI program benefits are established under state law and are payable for a period not to exceed a maximum duration. In 1970 federal law began to require states to extend this maximum period of benefit duration by 50 percent during periods of high unemployment. These extended benefit payments are paid equally from federal and state accounts.

Cash Flow Projections

The significant assumptions used in the cash flow projections of the UTF include total unemployment rates, civilian labor force levels, percent of unemployed receiving benefits, total wages, distribution of benefit payments by state, state tax rate structures, state taxable wage bases, interest rates on UTF investments, and the CPI-U for good and services. Cash projections depend on the assumptions used and actual experience may differ materially from the projections. Under expected economic conditions, total cash inflows, excluding interest earnings, are projected to exceed total cash outflows through the end of the projection period.

Sensitivity Analysis. The effect on the accumulated UTF assets of projected total cash inflows and cash outflows of the UTF, in constant dollars, over the ten-year period ending September 30, 2027, are demonstrated in two sensitivity analyses. Each sensitivity analysis uses an open group, which includes current and future participants in the UI Program. Sensitivity Analysis I assumes higher rates of unemployment and Sensitivity Analysis II assumes even higher rates of unemployment compared to expected economic conditions. In Sensitivity Analysis I, which uses a higher unemployment rate of 5.72 percent beginning in fiscal year 2018, net cash inflows are negative in fiscal years 2018 through 2021, become positive in fiscal year 2022, and remain positive through 2027. In Sensitivity Analysis II, net cash outflows, including interest earnings and expenses, are projected in fiscal years 2019 through 2023, but outflows exceed inflows in fiscal years 2024 through 2027. Net cash inflows are reestablished in fiscal year 2024 and peak in fiscal year 2026, with a drop in the unemployment rate to 8.28 percent in fiscal year 2022, and then steadily downward for fiscal years 2023 through 2027. The example of expected economic conditions and two sensitivity analyses, in constant dollars, demonstrate the counter cyclical nature of the UI Program, which experiences net cash inflows during periods of low unemployment that are depleted by net cash outflows during periods of increased unemployment. For further detail on the sensitivity of the projections of the UI Program, refer to DOL's financial statements.

Sustainability of Unemployment Insurance

The ability of the UI Program to meet a participant's future benefit payment needs depends on the availability of accumulated taxes and earnings within the UTF. The effect of projected benefit payments on the accumulated net assets of the UTF is measured, under an open group scenario, which includes current and future participants in the UI Program. As of September 30, 2017, total assets within the UTF exceeded total liabilities by $58.6 billion. At the present time there is a surplus; any surplus of tax revenues and earnings on these revenues over benefit payment expenses is available to finance benefit payments in future periods when tax revenues may be insufficient. For more information on the sustainability of the UI Program, refer to DOL's financial statements.

Unemployment Trust Fund Solvency

Each state's accumulated UTF net assets or reserve balance should provide a defined level of benefit payments over a defined period. To be minimally solvent, a state's reserve balance should provide for one year's projected benefit payment needs based on the highest levels of benefit payments experienced by the state over the last 20 years. A ratio of 1.0 or greater indicates that the state UTF account balance is minimally solvent. States below this level are vulnerable to exhausting their funds in a recession. States exhausting their reserve balance must borrow funds from the Federal Unemployment Account (FUA) to make benefit payments. In fiscal year 2017, there were no FUA borrowings.

The results of DOL's state by state analysis indicate 28 state funds plus the fund of the Virgin Islands were below the minimal solvency ratio of 1.0 at September 30, 2017.