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UNFUNDED OBLIGATION AND TRANSITION COSTS FOR THE OASDI PROGRAM

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1. Introduction

In calculating the unfunded obligation of the Old-Age and Survivors Insurance and Disability Insurance (OASDI) program, we include the entire cost of paying scheduled benefits in full and on time, even after trust fund reserves are depleted. However, when the trust fund reserves are depleted, current law limits expenditures to the amount of continuing income received by the fund. Thus, the measures of unfunded obligation represent the shortfall of financial resources scheduled under current law to cover the cost associated with timely payment of scheduled benefits for the period.

The unfunded obligation for any program must be defined on the basis of the intended funding method for the program. Because the OASDI program is financed on essentially a current-cost or pay-as-you-go basis, the open group unfunded obligation measure is appropriate. Programs that are intended to be essentially fully-advance-funded require the use of other measures, reflecting a closed group perspective, to assess their unfunded obligation (or liability). However, these closed group measures are more accurately described as theoretical measures of "transition cost" for the OASDI program. Estimates of the unfunded obligation vary depending on the valuation period and the assumptions used. Transition cost measures also vary depending on which plan participants are included.

The purpose of this actuarial note is to present, explain, and clarify the various measures of unfunded obligation and transition cost considered in the context of the OASDI program.[1] Section 5 presents the various concepts, as defined by the Office of the Chief Actuary (OCACT), which appear throughout this note. Table 1 contains estimates of the open group unfunded obligation measured over two different time periods, the next 75-year period and the infinite horizon. Table 2 shows the unfunded obligation for all participants through the infinite future, decomposed into two additive components: (1) the unfunded obligation for past and current participants and (2) the net shortfall for future participants. Table 3 includes estimates for the closed group transition cost and the maximum transition cost. All estimates for these measures provided in Tables 1 through 3 are based on the intermediate assumptions of Trustees Reports through 2018.

The estimates of the unfunded obligation presented in Tables 1 through 3 are expressed in present value dollars and as percentages of taxable payroll and GDP. The estimates expressed as percentages provide a useful basis for comparing the levels of unfunded obligation from one valuation to the next. In the absence of any substantial changes in assumptions, methods, or experience, these percentages tend to be stable except to the extent that additional years are added to the valuation period. However, estimates expressed in dollars tend to increase by about the annual interest rate for each year the valuation period is moved forward.

2. Open Group Unfunded Obligation

The open group unfunded obligation is consistent with a pay-as-you-go financing approach and is thus appropriate for assessing the actuarial status of the OASDI program. We use the term obligation instead of the term liability because liability generally indicates a legal contractual obligation. No legal contractual obligation exists for paying full scheduled benefits on time once the trust fund reserves are depleted. In fact, current law requires that, when the trust fund reserves are depleted, total benefits paid cannot exceed income received. Of course, Congress can enact legislation to change the benefits scheduled in current law at any time.

Estimates of the open group unfunded obligation for the 75-year projection period are presented in Table 1 for annual valuations dated January 1, 1980 through January 1, 2018. The year of the Trustees Report, which identifies the intermediate assumptions used in determining the estimates, is the same as the year of the valuation date. Significant uncertainty surrounds the estimates for a period as long as 75 years. A discussion of this uncertainty is located in appendix E of the 2018 Trustees Report.[2]

[1] Additional details and explanation may by found in "Measuring Solvency in the Social Security System" by Stephen C. Goss, in chapter 2 of Prospects for Social Security Reform, Mitchell, Myers & Tang, eds., pp. 16-36.

[2] This report can be found at: www.ssa.gov/OACT/TR/2018/index.html.

Estimates of the open group unfunded obligation for the infinite future are also presented in Table 1 for valuations dated January 1, 2003 through January 1, 2018. The unfunded obligation for the infinite future provides a more complete and extended measure of the expected future financial shortfall for the OASDI program. However, the shortfall for the infinite future must be considered in the context of the period over which program modifications are needed (in this case, the infinite future). It is also important to note that the uncertainty surrounding estimates made for periods longer than 75 years is much greater than that for the 75-year period (which, as noted above, reflects significant uncertainty). It would have been extremely difficult to make projections of today's economy and the numbers of various workers and beneficiaries from a perspective, for example, of 200 years ago. In addition, estimates for the infinite horizon are based, in part, on the assumption that the normal retirement age for those turning 62 after 2022 will remain at age 67, even though mortality is expected to continue improving. This means that, in the absence of any change in the law, retirees could expect to receive benefits for an ever-increasing portion of their adult lifetime.

Solvency for the OASDI program at any point in time means that the program is able to pay scheduled benefits in full, on a timely basis, at that time. This is indicated by a positive trust fund balance at that time. However, it is important to realize that the open group unfunded obligation for a period, as a single summarized measure, indicates the financial status of the program for that period taken as a whole and whether the program will be financially solvent at the end of that period. If the unfunded open group obligation over the period is zero or negative, this does *not* necessarily indicate solvency throughout the period.

In evaluating the actuarial status of the OASDI program, it is desirable to determine not only whether solvency is expected to be achieved for the 75-year long-range period, but also whether solvency is expected to be sustained thereafter. When the program meets both conditions, it is considered "sustainably solvent." Specifically, OCACT focuses on a 75-year projection period and uses the following criteria:

- The level of the combined trust funds at each point in time during the 75-year projection period must be positive, and
- The level of the combined trust funds, expressed as a percent of annual program cost, must be stable or rising at the end of the 75-year period. (This indicates that the solvency of the OASDI program is expected to be sustained well beyond the end of the period.)

3. Decomposition of the Unfunded Open Group Obligation over the Infinite Future

Table 2 separates the unfunded open group obligation over the infinite future into two components from a generational perspective. The table presents this decomposition for valuations dated January 1, 2003 through January 1, 2018, the valuation dates for which the unfunded obligation over the infinite future have been estimated. These components are important for evaluating the financial status of a program that is designed to be fully-advance-funded. The first of these two components, the "closed group transition cost", is the present value of the net cost that would remain if participation in the program were closed off to individuals who have not attained age 15 in the first year of the projection period.[3] The second component is the present value of the net cost of providing scheduled benefits for future participants in the program (those who have not attained age 15 in the first year of the projection period or those not yet born on the valuation date) for the infinite future less the scheduled taxes they would be expected to pay. If this net cost for future participants is zero or negative, then scheduled taxes for future generations are expected to be sufficient to finance their benefits on a fully-advance-funded basis.

Under a pay-as-you-go program like the OASDI program, the taxes of each generation are used to pay for benefits to prior generations and are not used to advance fund their own benefits. Thus, whether taxes for future generations equal, exceed, or fall short of the present value of the cost of their own scheduled benefits is not relevant to the actuarial status of the program. Similarly, the closed group transition cost of the program is not relevant to the actuarial status of the program, because benefits of current program participants will be paid largely by the taxes of future generations, which are not reflected in this value.

The concept of closed group transition cost may have specific applications in cases like that of the Federal Government closing the Civil Service Retirement System plan to persons newly hired after 1983. In general, however, this concept is only appropriate for evaluating the actuarial status of an ongoing plan that is intended to be essentially fully-advance-funded, such as plans covered under the Employee Retirement Income Security Act (ERISA).

For a social insurance plan that is designed to be financed on a pay-as-you-go basis with the expectation of a continuing flow of new entrants, like OASDI, the

[3] In Table 3, which presents the closed group transition cost for valuations dated earlier than January 1, 2018, the youngest age in the closed group varies slightly for valuations before 1984.

closed group transition cost should not be used as a measure of financial status because it is inconsistent with the design and intent of the program. However, the concept can be useful in the context of a continuing social insurance program that is converting to another form, where there is a desire to keep the financing of the old and new forms separate for analytical purposes.

4. Maximum Transition Cost

The "maximum transition cost" represents the transition cost for continuing the Social Security program in a different form, with all payroll taxes for work after the valuation date credited to the new benefit form. The maximum transition cost is equivalent to the unfunded accrued obligation of a plan designed to be fully-advance-funded at the time of plan termination and would be an appropriate calculation to evaluate the actuarial status of an ERISA plan. However, this concept may be applied when a continuing plan, which has been financed on a pay-as-you-go basis, is being converted abruptly to a new form that will apply not only for future participants but also with respect to all future taxes or premiums of current participants. Table 3 presents the closed group and maximum transition costs for valuations dated January 1, 1980 through January 1, 2018.

5. Definitions

The definitions of various measures and the terms used in the accompanying tables are presented below.

Accrued benefit obligations—Future benefit obligations based on past earnings as of the valuation date. Thus, these accrued benefit obligations are relevant only to current participants as of the valuation date. The accrued benefit obligations are based on the primary insurance amount (PIA), the early retirement or delayed retirement factors, and other rules of payment. The accrued benefit obligations include:

1) Benefits scheduled to be paid for current retired-worker beneficiaries and disabled-worker beneficiaries who continue to be disabled after the valuation date.
2) Retired-worker benefits based on PIAs determined as of the valuation date for workers who have reached benefit eligibility age (62) and are not yet receiving benefits.
3) Benefits calculated on a proportional past-service-credit basis determined as of the valuation date for current active participants under age 62. These benefits require a computation of a PIA (PIA_{DIB}) as of the valuation date, as if the worker had just become eligible to receive a disabled-worker benefit. These benefits are then adjusted so they may be viewed as benefit levels of a worker aged 62. The adjustments are made depending on the type of worker, as explained below.[4]

   a. For workers who survive to age 62 and are not disabled after the valuation date, PIA_{DIB} is indexed to age 62 by the national Average Wage Index (AWI), and is then multiplied by the fraction

      (age as of the valuation date – 22) / 40.

   b. For workers who survive to age 62, are not disabled as of the valuation date, and become disabled before age 62, PIA_{DIB} is indexed to the date of disability by the AWI, and is then multiplied by the fraction

      (age as of the valuation date – 22) /
      (age as of the date of disability – 22).

   c. For beneficiaries who are disability beneficiaries as of the valuation date, recover from disability before age 62, and survive to age 62, benefits equal the disability benefit scheduled to be paid until recovery. After reaching age 62, benefits are computed based on indexing the final disability benefit received before recovery ($PIA_{DIB\text{-}RECOV}$) to age 62 by the AWI, and are then multiplied by the fraction

      (age as of recovery from disability – 22)/40.

Benefits for auxiliary beneficiaries are based on the primary worker's benefits as described above.

Closed group transition cost—Computed like the open group unfunded obligation for a 100-year projection period with the exception that future participants are not included. Specifically, the future cost and future scheduled tax income for current participants only are included in the calculations along with the trust fund assets at the start of the period. The period is extended to 100 years past the valuation date in order to capture the lifetime of all current participants included in the valuation.

Current participants—All individuals who are age 15 and older as of the valuation year. This includes all individuals who have been, are, or will be workers or beneficiaries.[5] (As noted in Table 3, the youngest age in the closed group varies for valuations before 1984.)

[4] For the purpose of this measure, the accrued benefit obligations for current active participants under age 22 are assumed to be zero.
[5] Age of the individual is defined by the age of the worker who is the primary beneficiary of the account.

Future cost—The value of OASDI program benefits scheduled in current law and the cost of administering the program.

Future participants—Future workers and beneficiaries[6] who are under age 15 or not yet born as of the valuation year. (As noted in Table 3, the youngest age in the closed group varies for valuations before 1984.)

Future scheduled tax income—Mainly OASDI tax revenue (payroll tax contributions and income from taxation of scheduled benefits). May also include reimbursements from the General Fund of the Treasury scheduled in current law.

Maximum transition cost—The cost of meeting the accrued benefit obligations of the old form of the Social Security program while continuing the program in a completely different form, with all payroll taxes for work after the valuation date credited to the new benefit form. The maximum transition cost is determined as of the valuation date for current and past participants only. It is computed as the difference between:

(a) The present value of all future accrued benefit obligations payable on the old form, and

(b) The value of the assets on the valuation date plus the present value of revenue from taxation of future accrued benefit obligations payable on the old form.

The projection period ends 100 years past the valuation date in order to capture the lifetime of all current participants included in the valuation.

Open group unfunded obligation—Determined as of the valuation date over a specified time period (such as over the long-range 75-year period), computed as the difference between:

(a) The present value of the future cost of the program between the valuation date and the end of the specified time period, and

(b) The value of the assets on the valuation date plus the present value of the future scheduled tax income of the program between the valuation date and the end of the specified time period.

Future scheduled tax income and cost are projected using the intermediate assumptions for the indicated Trustees Report (the year of the Trustees Report corresponds with the year of the valuation date). All current participants, as well as future participants to the system, over the specified time period are included in the computations.

Past participants—Those who contributed to the program or received benefits from the program and are no longer alive as of the valuation date.

Sustainable solvency—Indicates that the combined OASDI Trust Funds are expected to be able to pay all scheduled benefits on time over the 75-year projection period and to continue paying all benefits on time for the foreseeable future. Thus, the following two conditions are required to be met:

(a) The level of the trust funds at each point in time during the 75-year projection period must be positive, and

(b) The level of the trust funds, expressed as a percent of annual program cost, must be stable or rising at the end of the 75-year period.

Valuation date—Beginning of the projection period or January 1 of the starting projection year. This date defines the point in time for determining present values.

Valuation year—First year of the projection period. This year is used to determine current and future participants.

[6] Age of the individual is defined by the age of the worker who is the primary beneficiary of the account.

Table 1.—Open Group Unfunded Obligation for the Combined Old-Age and Survivors Insurance and Disability Insurance (OASDI) Program

Valuation date: January 1 of year	Ultimate valuation interest rate	Open group unfunded obligation for the 75-year projection period beginning at valuation date			Open group unfunded obligation for the infinite future projection period beginning at valuation date		
			As a percent of future:			As a percent of future:	
		Present value[1]	Taxable payroll[2]	GDP[2]	Present value[1]	Taxable payroll[3]	GDP[3]
1980	6.080	1.4	—	—	—	—	—
1981	6.080	1.5	—	—	—	—	—
1982	6.080	1.5	—	—	—	—	—
1983	6.080	-0.1	—	—	—	—	—
1984	6.080	0.0	—	—	—	—	—
1985	6.080	0.3	—	—	—	—	—
1986	6.080	0.3	—	—	—	—	—
1987	6.080	0.4	—	—	—	—	—
1988	6.080	0.6	0.6	—	—	—	—
1989	6.080	0.8	0.7	—	—	—	—
1990	6.080	1.2	0.9	—	—	—	—
1991	6.392	1.1	0.9	—	—	—	—
1992	6.392	1.7	1.3	0.5	—	—	—
1993	6.392	1.8	1.3	0.5	—	—	—
1994	6.392	2.7	2.0	0.8	—	—	—
1995	6.392	2.7	2.0	0.8	—	—	—
1996	6.392	2.9	2.0	0.8	—	—	—
1997	6.295	2.8	2.1	0.8	—	—	—
1998	6.398	2.9	2.1	0.8	—	—	—
1999	6.399	2.9	1.9	0.8	—	—	—
2000	6.399	2.9	1.8	0.7	—	—	—
2001	6.399	3.2	1.7	0.7	—	—	—
2002	6.090	3.3	1.7	0.7	—	—	—
2003	6.090	3.5	1.8	0.7	10.5	3.8	—
2004	5.884	3.7	1.8	0.7	10.4	3.5	1.2
2005	5.884	4.0	1.8	0.6	11.1	3.5	1.2
2006	5.781	4.6	1.9	0.7	13.4	3.7	1.3
2007	5.781	4.7	1.8	0.7	13.6	3.5	1.2
2008	5.781	4.3	1.6	0.6	13.6	3.2	1.1
2009	5.781	5.3	1.9	0.7	15.1	3.4	1.2
2010	5.781	5.4	1.8	0.6	16.1	3.3	1.2
2011	5.781	6.5	2.1	0.7	17.9	3.6	1.2
2012	5.781	8.6	2.5	0.9	20.5	3.9	1.3
2013	5.781	9.6	2.6	0.9	23.1	4.0	1.4
2014	5.678	10.6	2.7	1.0	24.9	4.1	1.4
2015	5.678	10.7	2.5	0.9	25.8	3.9	1.3
2016	5.370	11.4	2.5	0.9	32.1	4.0	1.4
2017	5.370	12.5	2.7	0.9	34.2	4.2	1.4
2018	5.370	13.2	2.7	1.0	34.3	4.0	1.3

[1] Present value in trillions of dollars as of the valuation date.

[2] Projected for 75 years.

[3] Projected for the infinite horizon.

Notes: All estimates are based on the intermediate set of assumptions (Alternative II, or Alternative II-B in years when there were two intermediate sets) in the OASDI Trustees Report for the specified valuation year.

All values are subject to uncertainty, especially values over the infinite horizon.

Actuarial Note No. 2018.1
Social Security Administration
Office of the Chief Actuary
June 2018

Table 2.—Decomposition of the Unfunded Obligation for the Combined Old-Age and Survivors Insurance and Disability Insurance (OASDI) Program

Valuation date: January 1 of year	Ultimate valuation interest rate	Unfunded obligation for past and current participants			Net shortfall for future participants only through the infinite future			Unfunded obligation for all participants through the infinite future		
			As a percent of future:			As a percent of future:			As a percent of future:	
		Present value[1] [2]	Taxable payroll[3]	GDP[3]	Present value[1]	Taxable payroll[3]	GDP[3]	Present value[1]	Taxable payroll[3]	GDP[3]
2003	6.090	10.5	3.8	—	0.0	0.0	—	10.5	3.8	—
2004	5.884	11.2	3.8	1.3	-0.8	-0.3	-0.1	10.4	3.5	1.2
2005	5.884	12.0	3.8	1.3	-0.9	-0.3	-0.1	11.1	3.5	1.2
2006	5.781	13.3	3.6	1.3	0.1	[4/]	[5/]	13.4	3.7	1.3
2007	5.781	14.4	3.7	1.3	-0.8	-0.2	-0.1	13.6	3.5	1.2
2008	5.781	15.2	3.5	1.2	-1.5	-0.3	-0.1	13.6	3.2	1.1
2009	5.781	16.3	3.7	1.2	-1.2	-0.3	-0.1	15.1	3.4	1.2
2010	5.781	17.4	3.6	1.2	-1.3	-0.3	-0.1	16.1	3.3	1.2
2011	5.781	18.8	3.8	1.3	-0.9	-0.2	-0.1	17.9	3.6	1.2
2012	5.781	21.6	4.1	1.4	-1.1	-0.2	-0.1	20.5	3.9	1.3
2013	5.781	23.7	4.1	1.4	-0.6	-0.1	[5/]	23.1	4.0	1.4
2014	5.678	25.5	4.2	1.4	-0.6	-0.1	[5/]	24.9	4.1	1.4
2015	5.678	26.7	4.0	1.4	-1.0	-0.1	[5/]	25.8	3.9	1.3
2016	5.370	29.1	3.6	1.2	3.0	0.4	0.1	32.1	4.0	1.4
2017	5.370	30.8	3.7	1.3	3.4	0.4	0.1	34.2	4.2	1.4
2018	5.370	32.4	3.8	1.3	1.9	0.2	0.1	34.3	4.0	1.3

[1] Present value in trillions of dollars as of the valuation date.
[2] This value is also referred to as the closed group transition cost.
[3] Projected for the infinite horizon.
[4] Less than 0.05 percent of taxable payroll.
[5] Between -0.05 and 0.05 percent of GDP.

Notes: All estimates are based on the intermediate set of assumptions in the OASDI Trustees Report for the specified valuation year.
All values are subject to uncertainty, especially values over the infinite horizon.

Actuarial Note No. 2018.1
Social Security Administration
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June 2018

Table 3.—Closed Group Transition Cost and Maximum Transition Cost for the Combined Old-Age and Survivors Insurance and Disability Insurance (OASDI) Program

Valuation date: January 1 of year	Ultimate valuation interest rate	Closed group[1] transition cost (100-year projection period)			Maximum transition cost (100-year projection period)		
			As a percent of future:			As a percent of future:	
		Present value[2]	Taxable payroll[3]	GDP[3]	Present value[2]	Taxable payroll[3]	GDP[3]
1980	6.080	5.3	—	—	—	—	—
1981	6.080	5.5	—	—	—	—	—
1982	6.080	5.4	—	—	—	—	—
1983	6.080	4.8	—	—	—	—	—
1984	6.080	3.9	—	—	—	—	—
1985	6.080	4.3	—	—	—	—	—
1986	6.080	5.0	—	—	—	—	—
1987	6.080	5.2	—	—	—	—	—
1988	6.080	5.4	5.0	—	—	—	—
1989	6.080	5.7	5.0	—	—	—	—
1990	6.080	6.7	5.2	—	—	—	—
1991	6.392	6.2	5.2	—	—	—	—
1992	6.392	6.9	5.4	2.2	—	—	—
1993	6.392	7.2	5.3	2.1	—	—	—
1994	6.392	7.9	5.8	2.3	—	—	—
1995	6.392	7.7	5.8	2.3	—	—	—
1996	6.392	8.4	5.8	2.2	8.9	6.2	2.3
1997	6.295	7.5	5.7	2.1	8.7	6.6	2.5
1998	6.398	8.0	5.6	2.2	9.5	6.7	2.6
1999	6.399	8.3	5.5	2.1	10.2	6.7	2.6
2000	6.399	8.8	5.3	2.0	10.8	6.5	2.5
2001	6.399	9.6	5.3	2.0	11.7	6.4	2.4
2002	6.090	10.1	5.2	2.0	12.2	6.3	2.4
2003	6.090	10.5	5.3	2.0	12.6	6.3	2.4
2004	5.884	11.2	5.3	2.0	13.5	6.4	2.4
2005	5.884	12.0	5.4	1.9	14.5	6.5	2.4
2006	5.781	13.3	5.4	2.0	15.8	6.4	2.4
2007	5.781	14.4	5.5	2.0	16.7	6.4	2.4
2008	5.781	15.2	5.5	2.0	17.6	6.4	2.3
2009	5.781	16.3	5.8	2.1	18.9	6.7	2.4
2010	5.781	17.4	5.7	2.1	20.2	6.6	2.4
2011	5.781	18.8	6.0	2.2	21.6	6.8	2.5
2012	5.781	21.6	6.3	2.3	24.4	7.1	2.6
2013	5.781	23.7	6.4	2.3	26.9	7.2	2.6
2014	5.678	25.5	6.6	2.3	28.4	7.3	2.6
2015	5.678	26.7	6.4	2.3	30.4	7.2	2.6
2016	5.370	29.1	6.4	2.3	32.0	7.0	2.5
2017	5.370	30.8	6.6	2.3	34.0	7.2	2.6
2018	5.370	32.4	6.6	2.4	35.8	7.3	2.6

[1] The closed group consists of current participants (individuals who are age 15 and older) as of the valuation year.
Exception: The youngest age in the closed group is 16, 17, and 18 for 1981, 1982, and 1983 respectively.
[2] Present value in trillions of dollars as of the valuation date.
[3] Projected for 75 years.

Notes: All estimates are based on the intermediate set of assumptions (Alternative II, or Alternative II-B in years when there were two intermediate sets) in the OASDI Trustees Report for the specified valuation year. All values are subject to uncertainty, especially values over the infinite horizon.

Actuarial Note No. 2018.1
Social Security Administration
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