

SOME EFFECTS OF FULLY FUNDING OASDI
by Joseph A. Applebaum
Office of the Actuary

Introduction

Throughout the years there has been a continuous and lively debate as to how social security should be financed. Some participants who advocate "full funding" of the OASDI program do not define what that means other than an implicit desire for financing similar to private pension plans. This actuarial note presents some data regarding the implications of such full funding. Our intention is to add some knowledge to this field in the hope that it will help advocates to improve their vision of what they are proposing. We make no pretenses toward exhausting the subject. Other valid approaches could have been chosen. The methods used were selected for simplicity of calculation as well as for closeness to those generally used in private plans. Let us at this point turn to a discussion of what we believe is meant by full funding.

Consider a closed group of individuals who wish to finance a pre-determined amount of retirement income for themselves. Further, assume that the members all wish to retire at the same time. Because in this instance the program must be fully financed by the time the group retires, a fund must be accumulated from contributions paid in prior to retirement. Contributions that are sufficient to accumulate a fund adequate to provide the full amount of retirement income from principal and interest would thus represent full funding.

If, as is the case with employer-sponsored pension plans, there is a source of funding which can continue after a particular individual or group of individuals retire, the full funds necessary to provide for a group's retirement need not be accumulated prior to retirement. However, rational funding methods for private pension plans contemplate that contributions for individuals hired after the establishment of the plan and paid in over their careers will eventually be sufficient to provide their retirement income. This condition of full pre-retirement funding attained after a transition period of partial pre-retirement funding is what is commonly referred to as full funding in the context of social security as well as private pension plans.

Those who have studied the subject in detail (for example, the various Advisory Councils on Social Security) have invariably concluded that there is no real need to fully fund the social security system. It has been generally argued that while the security of private pensions may be better guaranteed by full funding, the social security system can more directly rest that security on the taxation powers of the government. This is particularly the case because the system covers the vast majority of workers in the nation. ^{1/}

^{1/} Given the long-established policy of investing trust fund assets in government debt securities, even under a full funding scheme, the security of the social security system would still rely ultimately on taxation powers.

Description of Methods

There are many methods of full funding a retirement and disability program such as OASDI, each with its own rationale and method. Many require the determination of a normal cost which is usually defined to be a rational pattern of funding sufficient to cover all the benefits related to new workers just entering the system. If the contribution were established at a level equivalent to the normal cost, the system would still not be fully funded, because many workers would have entered covered employment before the establishment of the funding method. These workers (including those already receiving benefits) would have already gained credits toward benefits whose costs were not reflected in the normal costs to be paid. These additional costs are generally referred to as the accrued liability, which by definition is the difference between the present value of future normal costs and the present value of projected benefits. In other words, the accrued liability is the present value of benefits that will not be financed by the normal-cost funding of the system.

For OASDI, the normal cost can be expressed as a level percentage of taxable payroll. Under our definition this normal cost is collected during the time a worker is in covered employment and, on the average, would suffice to pay the OASDI benefits earned by that worker. To estimate this normal cost, we computed the ratio of the actuarial present value of OASDI benefits to the actuarial present value of OASDI payroll with respect to the entire cohort of persons aged 19 to 23 as of January 1, 1979. This cohort provides a reasonable approximation to an entry-age calculation. Based on the intermediate assumptions of the 1979 OASDI Trustees Report including a long-range interest rate of 6.6 percent, the calculations show a normal cost of 13.72 percent of taxable payroll. It should be noted that, because social security cost projections include continuous changes in economic and demographic factors over time, similar calculations for younger cohorts would yield a different normal cost. However, calculations have shown that the normal cost for younger cohorts differs only slightly from 13.72 percent, which gives further evidence that this figure can be regarded as a good estimate of the "entry age" cost of OASDI.

If taxes were set at the normal-cost level, by definition the 19 to 23 year old cohort would contribute (along with its employers) the exact amount of OASDI taxes over their working years to pay for all their benefits. However, this is not the case with respect to the population aged 24 and over as of January 1, 1979. Their taxes based on the 13.72 percent normal cost would not be enough to cover all their benefits. The difference between the actuarial present value of their projected benefits and the actuarial present value of their normal-cost taxes could be regarded as the accrued liability. This amount represents the hypothetical funds needed as of January 1, 1979 to cover the projected deficit with respect to the closed group age 24 and over if the combined employer-employee tax rate were set at 13.72 percent in all future years. Based on the 1979 Trustees Report assumptions, the present value of OASDI benefits and taxable payroll for the closed group are estimated at \$6,519 billion and \$20,304 billion, respectively. Therefore, the accrued liability under the method chosen is \$3,734 billion (the difference between \$6,519 billion and 13.72 percent of \$20,304 billion).

The accrued liability as defined above could be funded in a number of ways. Among them we selected two ways that may have some meaning. The first method amortizes it as a constant percent of taxable payroll over the 75-year period used in the official OASDI cost projections. The second amortizes it over a 30-year period as a constant percent of taxable payroll. The latter method is analogous (but not identical) to the legal amortization standard for most private defined-benefit pension plans under ERISA. ^{2/} The amortization payments would amount to 4.63 percent of taxable payroll over the 75-year period and 10.68 percent over the 30-year period. It should be noted that under our assumptions both the normal cost and amortization of accrued liability would be payable on behalf of all workers, not just those aged 19 and over as of January 1, 1979.

Results for the OASDI Trust Funds

The higher tax rates related to the 75-year or 30-year amortization of the accrued liability (as shown in the table below) would yield higher trust fund accumulations. Under the financing schedule in present law, the OASDI Trust Funds are estimated under the intermediate cost assumptions to build up to considerable size over the medium-range, reaching their maximum size of about 2 to 3 times annual expenditures (including administrative expenses and the Railroad financial interchange) around the year 2010, before starting to decrease rapidly until exhaustion about 15 years later.

OASDI Combined Employer-Employee Tax Rates

<u>Calendar Years</u>	<u>Present Law</u>	<u>Normal Cost and Accrued Liability, Amortization on</u>	
		<u>75 Years</u>	<u>30 Years</u>
1979-1980	10.16%	18.35%	24.40%
1981	10.70	18.35	24.40
1982-1984	10.80	18.35	24.40
1985-1989	11.40	18.35	24.40
1989-2008	12.40	18.35	24.40
2009-2053	12.40	18.35	13.72
2054 & after	12.40	13.72	13.72

To determine the size of the accumulation, we prepared new projections based on the above tax schedules. Except for the changes in the assumed tax rates the methods normally used to project income and outgo of the trust funds were retained. Table 1 shows, under both amortization schedules, the size of the OASDI Trust Funds in relation to annual expenditures and as a ratio to estimated GNP over selected years in the 75-year period. It will be observed that by the end of the 75-year period, the trust funds are at the same level under either amortization plan, but the fund accumulates more rapidly under the shorter-period amortization.

^{2/} Under ERISA, defined-benefit pension plans are required to amortize the accrued liability in level dollar payments over 30 or 40 years.

With 30-year amortization the highest level of the trust funds relative to projected annual expenditures occurs at the beginning of the year 2009 (the end of the amortization period). The ratio is then 35.9 times annual expenditures. Thereafter the ratio declines until the beginning of 2034 (the ratio is then 27.8 times annual expenditures). From then until the end of the 75-year period the ratio stabilizes at about 28 times annual expenditures. Throughout the entire period, the balance in the trust funds grows in absolute size. The relative decline and leveling off after the turn of the century are due to growth in expenditures because of the demographic effects related to birth rates. When the accrued liability is amortized over the 75-year period, however, the trust funds grow both absolutely and in relation to annual OASDI expenditures throughout the 75-year period.

It may be of interest to note that the trust funds would grow from about 2 percent of GNP in 1979 to about 160 percent of GNP by the end of the 75-year period and that under the 30-year amortization they reach a peak of about 180 percent of GNP. This is an enormous fund, and the question arises as to how to invest it; for example 180 percent of the calendar year 1978 GNP would be about \$3 trillion. This is higher than the combined amounts of the national debt and the total equity values and outstanding debt of U.S. corporations.

Conclusions

We have seen that a method of fully funding OASDI would lead to the accumulation of a trust fund of mammoth size. Clearly, such a funding policy would not leave the nation's economy unaffected. Thus, the relationship of trust fund size and GNP presented are, to some extent, artificial. However, even with this caveat, these figures do draw attention to the significant economic consequences of full funding.

Table 1

COMPARISON OF GASDI TRUST FUNDS WITH ANNUAL GASDI EXPENDITURES
AND WITH GNP FOR 75 AND 30 YEAR AMORTIZATION OF "UNFUNDED LIABILITY"

Calendar Year	Ratio of Funds at Beginning of Year to Expenditures in Year		Ratio of Funds at Beginning of Year to GNP in Year	
	75-Year	30-Year	75-Year	30-Year
	<u>Amortization</u>	<u>Amortization</u>	<u>Amortization</u>	<u>Amortization</u>
1979	.30	.30	.02	.02
1980	.77	1.17	.04	.06
1985	4.35	7.66	.20	.36
1990	7.87	13.96	.37	.65
1995	11.41	20.29	.52	.94
2000	15.21	26.95	.69	1.37
2005	18.33	32.72	.83	1.48
2010	20.41	35.61	.97	1.69
2015	21.41	33.73	1.11	1.75
2020	21.56	31.40	1.23	1.79
2025	21.49	29.33	1.31	1.80
2030	21.85	28.17	1.36	1.76
2035	22.78	27.84	1.41	1.73
2040	24.30	28.19	1.46	1.69
2045	25.83	28.44	1.50	1.65
2050	27.15	28.42	1.53	1.61
2054	28.27	28.27	1.59	1.59