



PRESENT VALUE  
OF DI BENEFITS  
IN CURRENT  
PAYMENT STATUS,  
1968

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## FOREWORD

This is the first study to present estimates of the present value of future benefits payable from the Disability Insurance Trust Fund to disabled workers and their dependents who have a Social Security benefit in current-payment status. These estimates when compared with the balances in the trust fund should provide a measure of the degree of funding experienced in the Disability Insurance portion of the Social Security program. This measure could be compared with similar measures in private pension plans and in other governmental plans. However, it should be kept in mind that such figures cannot be used as a measure of the financial soundness of the DI program and that no goal presently exists regarding their desirable level. In a social insurance program like the Disability Insurance system, which could be assumed to operate into perpetuity and could, therefore, take into account future entrants, the best measure of financial stability is whether or not the present fund on hand plus the future income from taxes and interest earnings would be enough to pay all promised benefits and all necessary administrative expenses for the foreseeable future.

The study also presents estimates of the present value of all Social Security monthly benefits that are payable to the present disabled-worker beneficiaries and to their dependent beneficiaries. These amounts should provide a better idea of the total liability that the OASDI system as a whole has with respect to these beneficiaries. In this case, a comparison with the balances in the OASDI trust funds would be meaningless, since there are other liabilities that the OASI program has with respect to person currently receiving monthly retirement, dependent and survivors benefits

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## A. Introduction

This study presents estimates of the present value of benefits in current-payment status to disabled worker beneficiaries and their dependents. This is the first study to present such estimates for the Disability Insurance program. Similar estimates have been prepared earlier for the OASI program.<sup>1/</sup>

Two different types of present values of benefits payable to disabled workers and to their dependents are presented in this study. The first type includes only those future benefits that are payable from the Disability Insurance Trust Fund. The second type includes, in addition, the old-age, dependents, and survivors monthly benefits that are payable from the Old-Age, and Survivors Insurance Trust Fund, if these benefits are a continuation of the benefits payable from the Disability Insurance Trust Fund. This means that old-age benefits would be included if the worker is a disabled beneficiary when he reaches age 65, but would not be included if he recovered from the disability before reaching age 65. Similarly, benefits payable to mothers, widows and wives of retired workers would be excluded if for any month before these benefits become payable they are not entitled to some OASDI benefits.

Benefits to disabled workers and to their dependents are payable from the Disability Insurance (DI) Trust Fund. However, a complete valuation of the benefits payable to DI beneficiaries should include benefits which will become payable as a result of the death of the disabled worker or of his attainment of eligibility for old-age benefits. These benefits are payable from the OASI Trust Fund.

This study also includes a comparison of the present value of benefits payable from the DI Trust Fund with the balance in the DI Trust Fund at the end of each calendar year. A similar comparison for the second type of present value, which includes benefits payable from either the DI or OASI Trust Fund would be meaningless. The relationship between the present value of benefits and the balances in the DI Trust Fund at the end of the year has no direct bearing on the actuarial soundness of the program. Any deficiency in the trust fund to meet the

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<sup>1/</sup> See Actuarial Studies No. 51 and 66.

present value of benefits in current-payment status does not necessarily imply that the system is not in actuarial balance. The measure of actuarial soundness of the program compares the future income to the trust fund (in addition to the balance on hand) with the future outgo, which includes benefits to present as well as future beneficiaries. The present values in this study do not include the indirect benefits payable to some beneficiaries through the Financial Interchange provision with the Railroad Retirement System.

## B. Methodology and Assumptions

The first benefits under the DI program were payable for July 1957, but at that time only disabled workers were eligible for benefits. Benefits to dependents later became payable in October 1958. The first valuation of benefits in current-payment status in this study is as of December 31, 1957. Subsequent valuations are presented as of the end of each calendar year through 1967, with a preliminary estimate for 1968. The basic data utilized in the calculations are available in the Annual Statistical Supplements to the Social Security Bulletin.

The calculations involve the multiplication of the amount of benefits in current-payment status by age, sex, and type of benefits by appropriate annuity factors.

For the valuation of benefits payable from the DI Trust Fund, the annuity factors (present value of \$1 a month discounted for interest, mortality, and recovery) for disabled workers by age and sex are taken to age 65, since benefits after age 65 are covered by the OASI Trust Fund. The disability termination rates on which the annuity factors are based were compiled on a five-year select basis; that is, within the first five years after the worker becomes disabled, termination rates are determined by duration of disability as well as by age. Since data on disability beneficiaries are not readily available by age and duration, a four-year duration was assumed for all disabled worker beneficiaries. This assumption is believed to produce acceptable results, on the average. In the valuation of benefits to children under age 18, student children, and wives, mortality was disregarded. Although there were a few wives age 62 and over, it was assumed for purposes of this study that all wives receiving benefits have children under age 18. For years since 1965, when student benefits were first available, it was assumed that children under 18 will receive benefits until they are 20 (that is, they will become students and remain in that status for two years) and that all children who are students at the time of valuation will receive benefits for half the time between that date and their 22nd birthday. This is equivalent to an assumption that all children will be students for half of their remaining years between their 18th and 22nd birthdays.

The duration of wife's benefits was assumed to be six years, regardless of the wife's age. This figure was computed as the difference between age 18 and the average age of all children under



age 18. The duration of the wife's benefit should actually have been related to the age of the youngest child, but such data are not readily available. It is believed that the error involved in the assumption is partially offset by the assumption of no mortality for wives.

Benefits to all dependents are contingent on the survival of the primary beneficiary. Since the data for this study are not grouped according to individual families, it was necessary to assume an average age for all workers in order to compute the annuity factors for dependents' benefits. For purposes of computing these annuity factors, all workers were assumed to be males aged 45. This age was estimated on the basis of awards data to be the weighed average age for male workers when number of dependents was used as weight. However, since parents of disabled children are older, on the average, it was assumed that their average age would be 50. In order to avoid complex joint-life functions, the benefits for disabled children were not calculated according to age of the beneficiary. Instead, an average period of 12 years certain with respect to the child but contingent on the father's life was used. This represents a 3-year reduction from the maximum 15 years that is possible according to the father's assumed age i.e. from (age 50 to age 65), to account for possible death and recovery of the child.

Lump-sum death benefits are not included in this study. Although the valuation of benefits to DI beneficiaries includes benefits payable from the OASI as well as the DI Trust Fund, it is difficult to establish if the lump-sum death payment will be made to one of the current dependent beneficiaries. Since the amount of such benefits is relatively small, the results of this study are not significantly affected by their omission.

All other survivor benefits are included in the valuations of the second type of present value. The assumptions regarding age of the worker and maximum duration of benefits that were used for life benefits were also used for survivors benefits. In the valuation of these benefits, multiple decrement techniques had to be used since the benefits would become payable only if the disabled worker died. There would be no benefit payment if the worker recovered from the disability. The annuity factors also include adjustments for the fact that survivors benefits are a higher percentage of PIA than life dependent benefits.

Calculations for this study were done on the assumption

that the level of benefits at the time of each valuation would remain the same, and that no changes in the Social Security Act would be enacted in the future. Since benefits have been increased in the past and will probably be increased in the future, the actual value of future benefits to beneficiaries in current-payment status will probably be higher than estimated in this study. The uncertainties concerning possible future changes in the law and their timing makes a more realistic valuation of future benefits impossible.

### C. Present Value of Benefits in Current-Payment Status

The present value of future benefits payable to current beneficiaries is estimated as of December 31 of each year (November 30 for 1958, since detailed data for December were not available). These estimates do not include the value of benefits to persons who are not beneficiaries but who could have benefits payable in the future. In this category we can include (1) workers who are insured for disability but who are not disabled, (2) those workers whose claims are pending, (3) those workers who have been awarded benefits but are not in current-payment status including those who are in the six-month waiting period, and (4) dependents of the above workers. In addition, for the second type of present value, it was decided to include benefits payable from the OASI Trust Fund only if there was no discontinuity in benefit payments to the beneficiary. That is, if the OASI benefits immediately replaced the DI benefits.

Table 1 presents the amount of benefits in current-payment status at the end of each year through 1968 by type of benefit. In analyzing the table, we should keep in mind the fact that dependents first became eligible for DI benefits in 1958, and that in 1960 the age-50 requirement for disabled-worker benefits was removed, bringing about a sharp increase in the number of beneficiaries in all categories, particularly for dependents, since young workers are more likely to have children under 18. Also, in 1965, student-children aged 18-21 became eligible for benefits. In addition, benefit increases to all Social Security beneficiaries, including DI beneficiaries became effective in 1958, 1965, and 1968 averaging about 7.1%, 7.7%, and 13.3%, respectively. It should be observed that as of the end of 1968, DI benefits were payable at a monthly rate of \$182 million, or about \$2.2 billion per year.

Tables 2 and 3 give the present value of benefits in current-payment status by year and type of benefit. Table 2 includes only benefits which are payable from the DI Trust Fund -- that is, while the worker is alive, disabled and under age 65. Table 3 includes benefits payable from both OASI and DI Trust Funds. Benefits payable from the OASI Trust Fund include old-age benefits to disabled workers who attain age 65 while still disabled and survivor benefits to dependents of disabled workers who do not recover from the disability and die before age 65. The former category represents a much larger percentage of the total present value of benefits than the latter. In these calculations, interest was assumed to be 4.25% per year.

It should be observed that as of the end of calendar year 1968, the present value of benefits payable from the DI Trust Fund to the then-current beneficiaries would be estimated at \$10.9 billion. This amount would increase to \$25.2 billion if old-age and survivors benefits payable to these beneficiaries were also included.

#### D. Average Valuation Factors

Tables 4 and 5 present the average valuation factors by type of benefit and year. These valuation factors represent the present value of future benefits that are payable for each \$1 of monthly benefit that is in current-payment status. The factors in Table 4 include only those benefits payable from the DI Trust Fund, while the factors in Table 5 include benefits payable from both the OASI and DI Trust Funds. These factors are determined by dividing the total present value of each type of benefit by the total monthly amount of benefits in current-payment status. In this sense, they represent an average of future possible continuous benefits.

The factors increased sharply for disabled workers in 1960 due to the elimination of the age 50 limitation for entitlement to disability benefits, which brought in many young workers. This change also had the effect of lowering the average age of children receiving benefits and therefore increased the valuation factors for them too. The factor for children increased again in 1965 because of the addition of students benefits payable at ages 18-21. This change extended the average period over which child benefits are payable.

The factors for 1968 were obtained by extrapolation from the factors for previous years. In accordance with the experience in the last few years, the factors were projected to decrease slightly in 1968. These extrapolated factors were used in estimating the present value of benefits in current-payment status at the end of 1968, since at the time of this study, monthly benefit data for 1968 was available by type of benefit, but not by age and sex of the beneficiary.

E. Comparison of the Present Value of DI Benefits in Current-Payment Status With the DI Trust Fund

Two types of present value of future benefits to current DI beneficiaries have been presented in this study. The first type includes only those benefits that are payable from the DI Trust Fund. The second type includes all future social security benefits (OASI as well as DI benefits) that are payable to these beneficiaries if they remain continuously to be entitled to some Social Security benefit under the same earnings record. This second type of present values is intended to provide a measure of the liability that the Social Security system has with respect to present beneficiaries under the DI program.

The first type of present value is intended to measure the liability with respect to these beneficiaries that could be directly assigned to the DI program. In this case, a measure of the degree of funding of the DI program could be obtained by comparing the estimated present values with the balances in the fund. Such a comparison is presented in Table 6.

In 1957, the DI Trust Fund was about 129% of the present value of benefits. It then decreased steadily reaching a low of 23% in 1967, but increased to 28% in 1968. The decreases which occurred in most years resulted mainly from increases in the level of benefits and from liberalizations of the eligibility requirements, without substantial changes in the financing. Although benefits were increased in 1968, this was more than offset by an increase in the confined employer-employee contribution rate from 0.7% to 0.95% in 1968 and by an increase in the taxable earnings base from \$6,600 to \$7,800 in the same year. The net effect was an increase in the ratio of trust fund to present value of benefits.

If in the future there are no further changes in the law, the ratio will probably continue to increase for some years and then decrease slowly and continuously. It should be observed that the financial stability of the DI program does not depend on the level of this ratio. The measure of the actuarial soundness of the program is based on a comparison of the expected future income and the balances on hand with the expected future outgo.

Table 1

MONTHLY AMOUNT OF DI BENEFITS IN CURRENT-PAYMENT  
STATUS AT END OF YEAR  
(in thousands)

<u>Year</u>	<u>Disabled Workers</u>			<u>Wives</u>	<u>Children</u>	<u>Total</u>
	<u>Male</u>	<u>Female</u>	<u>Total</u>			
1957	\$8,904	\$2,000	\$10,904	<u>1/</u>	<u>1/</u>	\$10,904
1958	16,137	3,380	19,517	\$415	\$496	20,428
1959	24,418	5,348	29,766	1,722	2,414	33,902
1960	33,034	7,630	40,664	2,629	4,696	47,989
1961	44,775	10,595	55,370	3,900	8,473	67,743
1962	53,289	13,382	66,671	4,754	11,055	82,480
1963	59,303	15,607	74,910	5,408	12,983	93,301
1964	63,976	17,497	81,473	5,766	13,950	101,189
1965	74,946	21,651	96,597	6,744	17,624	120,965
1966	82,951	24,693	107,644	7,562	20,482	135,688
1967	89,929	27,511	117,440	8,024	22,357	147,821
1968	<u>2/</u>	<u>2/</u>	144,909	9,688	27,374	181,971

1/ Benefits were not payable to this category of beneficiaries in 1957.

2/ Data not yet available by sex.

Table 2

PRESENT VALUE OF FUTURE DI BENEFITS PAYABLE TO BENEFICIARIES  
 WITH DI BENEFITS IN CURRENT-PAYMENT STATUS AT END OF YEAR  
 (in millions)

<u>Year</u>	<u>Disabled Workers</u>			<u>Wives</u>	<u>Children</u>	<u>Total</u>
	<u>Male</u>	<u>Female</u>	<u>Total</u>			
1957	\$388	\$114	\$502	<u>1/</u>	<u>1/</u>	\$502
1958	671	186	857	\$22	\$26	904
1959	1,032	288	1,320	90	122	1,531
1960	1,601	451	2,052	137	255	2,445
1961	2,469	678	3,147	204	491	3,841
1962	3,070	865	3,935	248	646	4,829
1963	3,465	1,003	4,468	282	753	5,503
1964	3,716	1,107	4,823	301	804	5,928
1965	4,380	1,376	5,756	352	1,244	7,352
1966	4,808	1,554	6,362	395	1,390	8,147
1967	5,187	1,721	6,908	419	1,501	8,829
1968 <sup>2/</sup>	<u>3/</u>	<u>3/</u>	8,513	506	1,834	10,853

1/ Benefits were not payable to this category of beneficiaries in 1957.

2/ Preliminary estimate.

3/ Data not yet available by sex.



Table 3

PRESENT VALUE OF FUTURE DI AND OASI BENEFITS PAYABLE TO BENEFICIARIES  
WITH DI BENEFITS IN CURRENT-PAYMENT STATUS AT END OF YEAR  
(in millions)

End of Year	Disabled Workers			Wives	Children	Total
	Male	Female	Total			
1957	\$1,122	\$3,361	\$1,458	<u>1/</u>	<u>1/</u>	\$1,458
1958	1,996	560	2,556	\$28	\$33	2,617
1959	3,040	879	3,920	111	157	4,194
1960	4,389	1,300	5,689	180	334	6,203
1961	6,351	1,865	8,216	267	651	9,134
1962	7,726	2,365	10,091	326	857	11,273
1963	8,658	2,751	11,409	371	1,000	12,779
1964	9,310	3,064	12,374	395	1,066	13,836
1965	10,940	3,799	14,739	462	1,692	16,893
1966	12,060	4,315	16,375	521	1,886	18,783
1967	13,044	4,796	17,841	550	2,030	20,420
1968 <sup>2/</sup>	<u>3/</u>	<u>3/</u>	22,012	664	2,477	25,153

1/ Benefits were not payable to this category of beneficiaries in 1957.

2/ Preliminary estimate.

3/ Data not yet available by sex.

Table 4

AVERAGE VALUATION FACTOR FOR BENEFITS PAYABLE  
FROM DI TRUST FUND

<u>Year</u>	<u>Disabled Workers</u>			<u>Wives</u> <sup>1/</sup>	<u>Children</u>
	<u>Male</u>	<u>Female</u>	<u>Total</u>		
1957	43.57	57.05	46.04	<u>2/</u>	<u>2/</u>
1958	41.56	55.03	43.89	52.20	52.19
1959	42.25	53.91	44.35	52.20	50.34
1960	48.46	59.14	50.46	52.20	54.37
1961	55.15	63.97	50.49	52.20	57.90
1962	57.61	64.64	59.02	52.20	58.39
1963	58.43	64.27	59.64	52.20	57.98
1964	58.08	63.29	59.20	52.20	57.61
1965	58.44	63.56	59.59	52.20	70.56
1966	57.96	62.94	59.10	52.20	67.85
1967	57.68	62.57	58.82	52.20	67.15
1968 <sup>3/</sup>	<u>4/</u>	<u>4/</u>	58.75	52.20	67.00

1/ This factor was assumed to remain constant.

2/ Benefits were not payable to this category of beneficiaries in 1957.

3/ Preliminary estimate.

4/ Data not yet available by sex.

Table 5

AVERAGE VALUATION FACTORS FOR BENEFITS PAYABLE  
FROM DI AND OASI TRUST FUNDS

<u>Year</u>	<u>Disabled Workers</u>			<u>Wives<sup>1/</sup></u>	<u>Children</u>
	<u>Male</u>	<u>Female</u>	<u>Total</u>		
1957	82.48	111.01	133.76	<u>2/</u>	<u>2/</u>
1958	82.13	110.67	130.97	68.52	65.83
1959	82.26	110.50	131.68	68.52	64.70
1960	84.40	111.26	139.90	68.52	71.21
1961	86.70	112.02	148.39	68.52	76.81
1962	87.37	112.08	151.30	68.52	77.51
1963	87.57	112.01	152.30	68.52	77.02
1964	87.45	111.84	151.88	68.52	76.42
1965	87.53	111.92	152.58	68.52	96.02
1966	87.43	111.81	152.13	68.52	92.10
1967	87.37	111.77	151.91	68.52	90.81
1968 <sup>3/</sup>	<u>4/</u>	<u>4/</u>	151.90	68.52	90.50

1/ This factor was assumed to remain constant.

2/ Benefits were not payable to this category of beneficiaries in 1957.

3/ Preliminary estimate.

4/ Data not yet available by sex.

Table 6

COMPARISON OF DI TRUST FUND WITH PRESENT VALUE OF FUTURE DI BENEFITS  
 PAYABLE TO BENEFICIARIES WITH DI BENEFITS  
 IN CURRENT-PAYMENT STATUS AT END OF YEAR  
 (amounts in millions)

<u>Year</u>	<u>Balance in Trust Fund</u>	<u>Present Values of Benefits Payable from Trust Fund</u>	<u>Trust Fund As Percent of Present Value of Benefits</u>
1957	\$649	\$502	129%
1958	1,379	904	153
1959	1,825	1,531	119
1960	2,289	2,445	94
1961	2,437	3,841	63
1962	2,368	4,829	49
1963	2,235	5,503	41
1964	2,047	5,928	35
1965	1,606	7,352	22
1966	1,739	8,147	21
1967	2,029	8,829	23
1968	3,023	10,853 <sup>1/</sup>	28 <sup>1/</sup>

<sup>1/</sup> Preliminary estimate.

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