

REVISED COST ESTIMATES FOR PRESENT TITLE II

(These tables are preliminary and subject to revision
and are not intended for general distribution)

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REVISED ESTIMATES FOR PRESENT TITLE II

In Actuarial Study Number 8 cost estimates were prepared in variations for such factors as retirement age, average wage, initial coverage, "in and out" movement, and interest rate. However, in no case was an estimate prepared for any combination of these nor was the factor of improving mortality considered. The purpose of this report is to present a cost estimate using the following combination of factors:

- a. Average wage of \$900 as against \$1100 originally.
- b. Average retirement age of 66 instead of $67\frac{1}{2}$ as originally.
- c. Initial coverage of about 32 million instead of $25\frac{1}{2}$ million as originally.
- d. Population estimates of the National Resources Committee (NRC)-- "medium" estimate--instead of the population estimates of the Committee on Economic Security (COES).

The initial coverage and average wage are based upon preliminary 1937 data. A memorandum by Mr. John J. Corson, Director of the Bureau of Old Age Insurance which explains the basis for these two figures of initial coverage and average wage is appended to this explanation.

In Table A there is shown a comparison of the population estimates mentioned above. For the age group 15-64 the NRC estimates agree quite closely with the COES estimates, although they tend to be slightly larger in the later years (by about 5% in 1980). However, for the aged population the NRC figures exceed the COES estimates by an increasing amount in the later years amounting to over 30% ultimately. The appreciably larger aged population under the NRC estimates is due chiefly to two factors: first, better mortality prior to 65 resulting in more people attaining that age; and second, better mortality after 65. As a result, more people attain 65 and live for a longer time thereafter under the assumptions underlying the NRC estimates.

In Table 1 there is shown a comparison of the estimated coverage, annuitants and deaths for the original and revised estimates of Title II. Under the original estimate the coverage increased from $25\frac{1}{2}$ million in 1937 to 35 million in 1980, while for the revised estimate the increase was from 32 million to almost 46 million. The revised estimate is thus about 25% greater than the original estimate in the early years and over

30% greater ultimately. The larger ultimate increase is due to the slightly larger population aged 15-64 in the NRC estimates as shown in Table A.

The number of annuitants under the original estimate increases from about 200,000 in 1942 to 6 million ultimately, while under the revised estimate the increase is from about 250,000 to 11½ million. It should be kept in mind that these figures for number of annuitants refer only to those who are estimated to be actually receiving benefits rather than also including those who are eligible but who are regularly employed. The revised estimate of annuitants is about 50% greater than the original estimate in the early years and almost 100% greater ultimately. This is due to three factors:

1. The increased coverage (about 30% greater).
2. The lower retirement age (resulting in about 20% more annuitants).
3. The better mortality of the NRC population estimates (resulting in about 30% more annuitants ultimately).

The number of deaths prior to age 65 under the original estimate ranges from about 200,000 in 1937 to about 340,000 ultimately, while under the revised estimate the number of deaths is practically constant at 220,000 throughout the entire period. This constant trend for deaths prior to age 65 is due to two conterbalancing factors:

1. The gradually increasing coverage.
2. The gradually decreasing mortality rate under the NRC population estimates.

As a result, the revised estimate shows about 15% more deaths prior to age 65 in 1937 than does the original estimate, about the same number in 1945, and about 30% less in 1980.

APPENDIX

by

John J. Corson

Director, Bureau of Old-Age Insurance

Explaining the Basis for the Use of 32 Million Initial Coverage and \$900 Average Wage for Actuarial Purposes

The initial coverage and average wage data used in these revised estimates were taken from preliminary data on wages and employment within the coverage of the Old-Age Insurance program now becoming available from tabulations of employers' reports for the calendar year 1937. For each of the semiannual reporting periods in 1937 approximately 1-3/4 million employers made returns, showing the employees who appeared on their pay rolls at any time during the period, the total taxable wages, and the items paid to individual employees, with their names and account numbers. By September 22, 1938, the total number of these wage items, eliminating duplicated items received the second time after return for correction, was approximately 75,100,000.

Some of these were received after postings as of 1937 had been closed, and therefore, for administrative and mechanical reasons, will be posted as of 1938. In addition, there are two other classes of items which have not yet been posted to individual accounts. The first are so-called "suspense" items, in the case of which the name on the earnings card did not agree with that on the master card bearing the same account number. The second class consists of the so-called "John Doe" items, which are those on which employers failed to report an account number, thus making it impossible to identify the employee. In the meantime it is impossible to post these items to individual accounts.

The wage items which have been posted as of 1937 are being brought together on summary cards for the individual employees concerned. On the basis of the ratio of processed earnings cards to summary cards, when about 60 percent of the work had been completed, it is estimated that the items posted as of 1937 represent approximately 30,500,000 employees.

The same ratio cannot be applied to the items not posted as of 1937, because large numbers of the latter apply to employees who already have wages posted to their accounts. Moreover, the "John Doe" items probably represent a relatively small number of individuals, since the average amount of wages per "John Doe" item is only \$106, as compared with an average per posted item of \$423. It is mainly a matter of conjecture, therefore, how many additional employees are represented by these items not posted as of 1937. Persons familiar with the data, however, are inclined to put the number from 1½ to 3½ million. When added to the 30,500,000 employees for whom identifiable items have been posted as of 1937, this points to an estimate of 32 to 34 million as the total number of individuals who earned some wages in covered industry in that year.

Since these figures include a small number of persons who were over age 65 and were therefore not covered by the old-age insurance system, and a substantial number of others whose earnings in covered industry were so small that they will probably never become eligible for monthly annuity benefits, the figure assumed as an initial coverage for actuarial calculations is the lower one of 32 million.

The total amount of wages represented by the 75,100,000 wage items received for 1937 is \$28,869,000,000. Assuming that this applies to 32 million employees, as just indicated, the average amount of wages per employee to be used for actuarial purposes is \$900.

Table A

COMPARISON OF POPULATION ESTIMATES OF COMMITTEE ON ECONOMIC SECURITY
AND NATIONAL RESOURCES COMMITTEE^{a/}

(All figures in thousands of persons)

Calendar Year	Population Aged 15-64			Population Aged 65 and Over		
	COES	NRC	Ratio	COES	NRC	Ratio
1940	91,086	90,552	99.4%	8,311	8,419	101.3%
1945	94,779	94,997	100.2	9,547	9,736	102.0
1950	97,307	97,800	100.5	10,862	11,213	103.2
1955	99,083	100,291	101.2	12,167	12,843	105.6
1960	100,062	102,290	102.2	13,589	14,842	109.2
1965	101,263	104,501	103.2	14,337	16,381	114.3
1970	101,782	105,971	104.1	15,055	18,043	119.8
1975	101,954	106,298	104.3	16,002	20,083	125.5
1980	101,318	105,798	104.4	16,990	22,190	130.6

^{a/} Assuming medium fertility and mortality and net immigration of 100,000 foreign-born persons annually after 1940. Source: page 14, Volume 1, "Population Statistics", National Resources Committee, October, 1937.

Table 1

COMPARISON OF ESTIMATES OF COVERAGE, ANNUITANTS, AND DEATHS
FOR ORIGINAL AND REVISED ESTIMATES^{a/} FOR TITLE II

(All figures in thousands of persons)

Calendar Year	Coverage			Annuitants			Deaths Before 65		
	Original	Revised	Ratio	Original	Revised	Ratio	Original	Revised	Ratio
1937	25,337	32,000	126%	---	---	-	191	219	115%
1940	26,082	32,941	126	---	---	-	201	219	109
1942	26,578	33,567	126	175	266	152%	207	218	105
1945	27,324	34,510	126	681	1,039	153	217	218	100
1950	28,566	36,258	127	1,680	2,596	155	234	219	94
1960	31,050	40,078	129	3,528	5,768	163	270	220	81
1970	33,534	44,089	131	4,705	8,441	179	309	227	73
1980	34,776	45,854	132	5,912	11,560	196	337	236	70

^{a/} Assumptions of estimates:

Factor	Original	Revised
Average Wage	\$1100	\$900
Retirement Age	67½	66
Initial Coverage	25,337,000	32,000,000
Population Basis	COES	NRC

Table 2

COMPARISON OF AVERAGE BENEFIT PAYMENTS FOR ORIGINAL AND REVISED ESTIMATES^{a/} FOR TITLE II

<u>Calendar Year</u>	<u>Average Annual Annuity</u>			<u>Average Death Benefit</u>	
	<u>Original</u>	<u>Revised</u>	<u>Ratio</u>	<u>Original</u>	<u>Revised^{b/}</u>
1937	\$---	---	--	\$19	\$16
1940	---	---	--	128	105
1942	\$200	\$190	95%	173	142
1945	218	205	94	277	227
1950	250	231	92	444	363
1960	337	295	88	711	582
1970	422	371	88	893	731
1980	522	455	87	988	808

a/ Assumptions of estimates:

<u>Factor</u>	<u>Original</u>	<u>Revised</u>
Average Wage	\$1100	\$900
Retirement Age	67½	66
Initial Coverage	25,337,000	32,000,000
Population Basis	COES	NRC

b/ Original estimate decreased by 18.18% (rate of decrease of revised estimate of average wage as compared to original estimate).

Table 3

COMPARISON OF BENEFIT PAYMENTS ACCORDING TO TYPE OF BENEFIT
FOR ORIGINAL AND REVISED ESTIMATES^{a/} FOR TITLE II

(All figures in millions of dollars)

Calendar Year	Annuity Benefits			Death Before 65			Death After 65	
	Original	Revised	Ratio	Original	Revised	Ratio	Original	Revised ^{b/}
1937	---	---	-	4	4	100%	--	--
1940	---	---	-	26	23	88	--	--
1942	35	51	146%	36	31	86	1	--
1945	149	213	143	60	49	82	5	2
1950	420	599	143	104	79	76	14	6
1960	1,189	1,702	143	192	128	67	49	20
1970	1,986	3,133	158	276	166	60	94	37
1980	3,086	5,262	171	333	191	57	157	62
1937-80	52,079	81,467	156	7,731	4,960	64	2,380	944

a/ Assumptions of estimates:

<u>Factor</u>	<u>Original</u>	<u>Revised</u>
Average Wage	\$1100	\$900
Retirement Age	67½	66
Initial Coverage	25,337,000	32,000,000
Population Basis	COES	NRC

b/ Original estimate reduced by 60.30% (to allow for retirement at 66 instead of 67½).

Table 4

COMPARISON OF PAYROLL AND BENEFIT PAYMENTS FOR ORIGINAL AND REVISED ESTIMATES^{a/} FOR TITLE II

(All figures in millions of dollars)

Calendar Year	Total Payroll			Total Benefit Payments ^{b/}			Benefits as % of Payroll		
	Original	Revised	Ratio	Original	Revised	Ratio	Original	Revised	Ratio
1937	27,870	28,800	103%	6	6	100%	.02%	.02%	100%
1940	28,690	29,650	103	49	46	94	.17	.16	94
1942	29,240	30,210	103	82	92	112	.27	.30	111
1945	30,060	31,060	103	218	269	123	.73	.87	119
1950	31,420	32,630	104	538	684	127	1.71	2.10	123
1960	34,160	36,080	106	1,430	1,850	129	4.18	5.13	123
1970	36,890	39,680	108	2,355	3,336	142	6.38	8.41	132
1980	38,250	41,270	108	3,576	5,515	154	9.35	13.36	143
1937-80	---	---	---	62,289	87,466	140	5.06 ^{c/}	7.03 ^{c/}	139

^{a/} Assumptions of estimates:

Factor	Original	Revised
Average Wage	\$1100	\$900
Retirement Age	67½	66
Initial Coverage	25,337,000	32,000,000
Population Basis	COES	NRC

^{b/} Including a small amount of estimated payments to non-qualified individuals at age 65 (not shown in Table 3).

^{c/} Level percent required to "support the plan into perpetuity".

Table 4a

INCREASE IN COST OF BENEFITS FOR CHANGES IN VARIOUS FACTORS
IN REVISED ESTIMATES^{a/}

<u>Factor</u>	<u>Type of Benefit</u>		
	<u>Death</u>	<u>Annuity</u>	<u>Total^{b/}</u>
Average Wage	0.0%	+ 7.2%	+ 6.1%
Average Retirement Age	- 8.6	+18.5	+14.4
Population Estimate	-41.5	+21.7	+12.0
All Three Combined	-54.6 ^{c/}	+46.5 ^{c/}	+39.9 ^{b/}

a/ Assumptions of estimates:

<u>Factor</u>	<u>Original</u>	<u>Revised</u>
Average Wage	\$1100	\$900
Retirement Age	67 $\frac{1}{2}$	66
Initial Coverage	25,337,000	32,000,000
Population Basis	COES	NRC

b/ Columns 1 and 2 weighted by .153 and .847, respectively, so as to allow for relative amounts of death and annuity benefits.

c/ Changes for each factor accumulated (e.g., + 46.5% comes from $1.072 \times 1.185 \times 1.217 = 1.465$).

Table 5

PROGRESS OF RESERVE FOR REVISED ESTIMATE^{a/} FOR TITLE II

(All figures in millions of dollars)

Calendar Year	Total Benefit Payments	Present Tax Schedule			Self-Supporting Tax Schedule ^{b/}		
		Appropri- ation	Interest on Reserve	Balance in Reserve	Appropri- ation	Interest on Reserve	Balance in Reserve
1940	46	830	48	2,425	830	48	2,425
1945	269	1,180	192	7,499	1,180	192	7,499
1950	684	1,860	392	14,645	1,860	392	14,645
1955	1,185	1,954	617	21,937	2,605	646	23,603
1960	1,850	2,056	802	27,730	3,084	962	34,273
1965	2,523	2,160	925	31,387	3,318	1,287	44,994
1970	3,336	2,262	970	32,218	3,474	1,578	54,311
1975	4,335	2,350	900	28,905	3,610	1,801	61,101
1980	5,515	2,352	657	19,390 ^{c/}	3,613	1,902	63,408 ^{d/}

a/ See footnote a in Table 1 for differences in assumptions between original and revised estimates.

b/ Schedule of Taxes and Expense Allowances in Arriving at Appropriations:

Period	Tax Rate	Expense as % of Taxes
1937-39	2%	8 1/3%
1940-42	3	6 2/3
1943-45	4	5
1946-48	5	5
1949-51	6	5
1952-54	7	5
1955-57	8	5
1958-60	9	5
1961-	9.22	5

c/ A Federal subsidy of 2,581 million dollars in each year after 1980 is necessary to maintain the reserve at the 1980 level. This subsidy is about 6 1/4% of the 1980 payroll.

d/ Reserve remains level at this figure after 1980.

Table 6

COMPARISON OF PROGRESS OF RESERVE UNDER ORIGINAL AND REVISED ESTIMATES^{a/}
FOR TITLE II

(All figures in millions of dollars)

Calendar Year	Original Estimate	Revised Estimate with Tax Schedule		Ratio to Column 1	
		Present	Self-Supporting ^{b/}	Column 2	Column 3
1940	2,337	2,425	2,425	104%	104%
1945	7,343	7,499	7,499	102	102
1950	14,732	14,645	14,645	99	99
1955	22,765	21,937	23,603	96	104
1960	30,067	27,730	34,273	92	114
1965	36,307	31,387	44,994	86	124
1970	41,625	32,218	54,311	77	130
1975	45,402	28,905	61,101	64	135
1980	46,641 ^{c/}	19,390 ^{d/}	63,408 ^{e/}	42	136

a/ Assumptions of estimates:

Factor	Original	Revised
Average Wage	\$1100	\$900
Retirement Age	67 $\frac{1}{2}$	66
Initial Coverage	25,337,000	32,000,000
Population Basis	COES	NRC

b/ Increasing from 2% in 1937-39 to 8% in 1958-60 by three year intervals of 1% each with ultimate rate of 9.22% in 1961 and thereafter.

c/ Reserve remains level at this figure after 1980.

d/ A Federal subsidy of 2,581 million dollars in each year after 1980 is necessary to maintain the reserve at the 1980 level. This subsidy is about 6 $\frac{1}{4}$ % of the 1980 payroll.