ACTUARIAL NOTE

THE SOCIAL SECURITY BENEFIT FORMULA

by Marice C. Hart
Office of the Actuary

The Social Security Act of 1935 envisioned a retirement plan for those aged 65 and over that would provide an income for the employed worker based on his wage history and financed in part by ear-marked taxes withheld from his pay. Although the label of insurance was not then attached, the program had both insurance and individual-savings characteristics. There was a money-back guarantee in event of ineligibility for monthly benefits or of death before receipt of benefits at least equal to taxes paid plus an allowance for interest.

The monthly benefit determined under the 1935 Act was closely related to total creditable and taxable lifetime covered wages, with an element of social adequacy in that the benefit formula favored the worker with low wages or with short coverage, through application of a much higher percentage to the lowest segment of total wages. The monthly benefit was $\frac{1}{2}\%$ of the first $3,000 of total wages, plus $\frac{1}{12}\%$ of the next $42,000 and $\frac{1}{24}\%$ of the next $84,000. Thus, total cumulative wages of $129,000 yielded the prescribed maximum benefit of $85 per month; the $129,000 figure represented 43 years of work at the maximum covered wages of $3,000 per year from a single employer (employment for more than one employer in a year could yield higher credited earnings than $3,000 per year).

The retirement program was a long-range plan scheduled to pay no benefits for 5 years after contributions were first collected, and then only relatively small amounts. The benefits developing would gradually build up with longer coverage, until the worker with

average wages who worked a normal span of some 40 years would receive a benefit of about half of his wages. These benefits scheduled under the 1935 Act to begin in 1942 were never paid, because the law was changed before they became effective.

Major amendments in 1939 introduced the computation of monthly benefits on the basis of average monthly wage, rather than on total wages, with the benefits first payable for January 1940. These benefit provisions remained in effect until 1950, when substantial changes were again made, followed by a number of further revisions during the next 20 years.

Eligibility Provisions

The benefit formula itself cannot be considered independently of other related provisions, because its application is prescribed by those provisions. The original requirement with respect to the minimum retirement age of 65 was reduced to age 62 for women in November 1956 and for men in August 1961. The age used to measure eligibility and to determine the period over which earnings are averaged in computing benefits was also reduced to age 62 for women in 1956, but remains at age 65 for men. This "computation-point" age, and not the minimum retirement age, is used for men in determining the average monthly wage to which the benefit formula is applied.

Of considerably more impact are the coverage requirements, which have been liberalized a number of times. Beginning with the 1939 Amendments, the requirement is ex-

pressed in terms of quarters of coverage, then generally a calendar quarter credited with at least $50 of wages. As shown in Table 1, the number of quarters of coverage required in order to be insured for retirement benefits has been reduced several times, from a requirement for coverage in half of the quarters elapsed after 1936 (or quarter of attainment of age 21, if later) to coverage in a number of quarters equal to the number of years (or one-fourth of the number of quarters) elapsed after 1950 (or year of attainment of age 21, if later). The elapsed quarters are now measured to the *year* of attainment of age 65 (age 62 for women), rather than to the quarter of such attainment.

The initial concept that a maximum of 40 quarters of coverage would provide permanently insured status has been retained; however, that maximum number will not in fact be required for men attaining age 65 and women attaining age 62 before 1991. The following table summarizes the effective requirement for men attaining age 65 at the beginning of the year:

Quarters of Coverage Required

Period	Minimum Year	Minimum Number	Maximum Year	Maximum Number
1940–50	1940	6	1950	26
1951–55	1951–54	6	1955	8
1956–60	1956–57	6	1960	16
1961–70	1962	11	1970	19
1971–80	1971	20	1980	29
1981–90	1981	30	1990	39
After 1990		40		40

While quarters of coverage are a factor only in determining eligibility and not directly in computing the amount of benefits, there was nonetheless an effect before 1960. Then, the average monthly wage to which the benefit formula was applied was required to be computed for the entire period preceding eligibility. This made a significant difference if first eligibility was after attainment of age 65 (age 62 for women after 1956), since then a longer period was used than the period preceding attainment of that age.

The method of computing average monthly wage, as shown in Table 2, has been modified extensively. The initial method of dividing total creditable wages by the number of months elapsed from the beginning of potential covered employment to retirement is now a determination of the highest average monthly wage for a fixed number of years depending only on date of birth. Earnings for any years after 1950 may be selected to make up the total earnings for this fixed number of years to be divided by the corresponding fixed number of months. Years after attainment of age 65 (age 62 for women) may be used, and earnings in years after initial retirement may be substituted for earlier years in an annual automatic recomputation of the benefit. Before the 1960 Amendments, earnings in years after age 65 (age 62 for women) could be used in the total only by increasing the number of years in the computation—that is, by adding 12 months to the divisor for each additional year of earnings added to the dividend.

The Benefit Formulas

Amendment of the benefit formula has generally been accompanied by changes in the maximum average monthly wage and in the minimum and maximum benefits, as shown in Table 3. Application of the formula to average monthly wage produces a "primary", called primary insurance benefit in the 1939 Amendments and now termed the primary insurance amount. This primary determines both the disability benefit and the old-age retirement benefit payable before any reduction for retirement before age 65, and it is also the basis for dependent and survivor benefits.

The benefit formulas which have been applied to average monthly wage are shown in Table 4. The years-of-service increment enacted in 1939 was not continued in the 1950 Amendments, although a modification of the 1939 formula with a maximum of 14 increment years (1937–50) remains available for use if wages before 1951 will produce a larger benefit.

All of the formulas contain a "breakpoint", below which an appreciably higher percent-

age is applied to average monthly wage. This breakpoint, initially $50, has remained at $110 since 1954. Before the 1958 Amendments, the benefit formula was contained in the law itself, expressed in two steps. Under the 1958 Amendments, a benefit table was substituted for the benefit formula; it was based on the two-step formula shown in Table 4, except that the primary insurance amount was rounded to the nearest dollar. The benefit formula for the 1958 Amendments was derived by applying a 7% increase to each of the percentages in the 1954 formula.

The benefit table in the 1965 Amendments was not derived from a formula, but rather it was computed by applying a 7% increase to the primary insurance amounts contained in the benefit table enacted in 1958, and rounding to the next higher multiple of 10 cents. The table was extended (in multiples of $1) to cover the increase to $550 in the maximum average monthly wage, without an increase in the percentage factor of 21.40% that had applied to average monthly wages of $111–400 in the 1958 formula. Thus, a three-step formula and another breakpoint was introduced.

Under the 1967 Amendments, a theoretical return was made to a two-step formula, so that the primary insurance amount for the maximum average monthly wage of $650 was 71.16% of $110, plus 25.88% of $540. However, the benefit table was derived by applying a 13% increase to the primary insurance amounts in the 1965 benefit table, with the extension (in multiples of $1) so computed as to produce the return to a two-step formula for the maximum average wage of $650.

The benefit table in the 1969 Amendments was derived by applying a 15% increase to the primary insurance amounts in the 1967 benefit table.

The benefit formulas can be closely approximated, for an average monthly wage of at least $110, by a flat amount plus a percentage of average monthly wage, as follows:

Amendments	Flat Amount	Percentage Factor
1939 Minimum	$15	10%
Maximum*	17	11
1950	35	15
1952	40	15
1954	39	20
1958	41	21
1965	44	23
1967	50	26
1969	57	30

* Effective maximum after modification under the 1950 Amendments.

The flat amount was 175% of the minimum primary insurance amount under the 1950 Amendments, and has since declined to 89%.

Conversion of Current Benefits

Each amendment of the benefit formula, effective for retirements after its enactment, has also provided for increases in benefit amounts for current beneficiaries. This conversion was the subject of prolonged deliberation before the 1950 Amendments were enacted (see *Actuarial Note No. 10*, January 1962). In some instances, the effective date for the new benefit formula and related provisions differed from the effective date for conversion of current benefits to the higher rate, as follows:

Amend-ments	Conversion Effective	Benefit Formula and Related Provisions Generally Effective
1939	——	January 1940
1950	September 1950	April 1952
1952	September 1952	September 1952
1954	September 1954	September 1954
1956	——	November 1956
1958	January 1959	January 1959
1960	——	January 1961
1961	August 1961	August 1961
1965	September 1965[a]	January 1966
1967	February 1968	February 1968
1969	April 1970[a]	January 1970

[a] Increased benefits were retroactive to January.

The requirements for converting monthly payments for millions of beneficiaries sometimes affects the manner in which new provisions are enacted. For example, application of a percentage increase is more feasible than altering the pattern of a benefit formula in effect.

Table 5 summarizes the benefit increases for current beneficiaries since 1950, together with additional benefit increases for certain survivors. The effect of general increases can be examined by a comparison of monthly benefit amounts for the month preceding conversion and the following month. Table 6 shows the average monthly benefit in current-payment status for those two months for each of the amendments except the last. For old-age beneficiaries, the increase in the average benefit has usually exceeded the general increase, largely as a result of an increase in the minimum benefit that exceeded the overall percentage increase. For all beneficiaries, the average increase was notably higher than the overall percentage increase under those amendments (1950, 1960, and 1961) that increased the percentage payable to certain survivors. Corresponding data for the 1969 Amendments, when available, should show an increase only slightly in excess of 15%, because the increase in the minimum benefit was only 1% more than the general increase.

Table 1

PROVISIONS TO DETERMINE NUMBER OF QUARTERS OF COVERAGE REQUIRED TO BE INSURED FOR RETIREMENT BENEFITS[1]

Amendments	Item	Provision
	Elapsed Period to Determine Number of Quarters of Coverage Required:	
1939	Measured in	Quarters
1960		Years
1939	Starts with Period After (or after attainment of age 21, if later)	1936
1950		1950
1939	Ends with Period Before Attainment of	Age 65
1956		Age 62 for Women
	Quarters of Coverage Required Equal to:	
1939	Fraction of Elapsed Quarters	½
1960		⅓
1961	Fraction of Elapsed *Years*	1
	Alternatives Available During 1956–60:	
1954	Elapsed Period Starts After	1954
	Elapsed Period Ends Before	
1954	(before attainment of age 65, if later)	July 1956
1956	(attainment of age 62 for women)	July 1957
	Quarters of Coverage Required	
1954	(earned in elapsed period with minimum	All
1956	of 6 quarters earned in period)	All except 4

[1] A quarter of coverage is any calendar quarter after 1936 credited with at least $100 of self-employment earnings or agricultural wages, or $50 of other wages (special rule for maximum covered wages in year). In all cases, a minimum of 6 quarters and a maximum of 40 quarters of coverage is required. Beginning in 1954, periods of disability are excluded from the elapsed period.

Table 2

PROVISIONS TO DETERMINE COMPUTATION OF AVERAGE MONTHLY WAGE

Amendments	Selection of Number of Months (divisor) and Years of Earnings (dividend)	Provision
	Computation Period:	
1939	Starts After Year of	1936
1950		1950 (Attainment of age 21, if later)
1960	For Months	1955 (Attainment of age 26, if later)
	For Earnings	1950
1939	Ends Before Quarter of	Retirement
1950	Ends Before Year of	Retirement or Attainment of Age 65, if then insured
1956		Retirement or Attainment of Age 65 (age 62 for women), if then insured
1960	For Months	Attainment of Age 65 (age 62 for women)
	For Earnings	Retirement (or later recomputation)
	Exclusions:	
1939	From Months	Quarters with less than $50 of Wages before Quarter of Attainment of Age 22
1950	From Months and Earnings	None
1954		4 Years (5, with 20 quarters of coverage)
1956		5 Years
1960	From Months	None
	From Earnings	Any—Years used may not exceed number used to determine months

Table 3

MAXIMUM AND MINIMUM PROVISIONS

Amendments	Maximum Average Monthly Wage	Primary Benefit		Family Benefit	
		Minimum	Maximum	Minimum	Maximum
1939	$250	$10.00	$45.60[a]	$10.00	$85.00
1950	300	20.00	80.00	15.00	150.00
1952	300	25.00	85.00	18.80	168.75
1954	350	30.00	108.50	30.00	200.00
1958	400	33.00	127.00	33.00	254.00
1961	400	40.00	127.00	40.00	254.00
1965	550	44.00	168.00	44.00	368.00
1967	650	55.00	218.00	55.00	434.40
1969	650	64.00	250.70	64.00	434.40

[a] Effective amount after modification under 1950 Amendments.

Table 4

BENEFIT FORMULAS

Amendments	Formula Applied to Average Monthly Wage		Plus		Plus		Plus	
	Percent	Of First	Percent	Of Next	Percent	Of Next	Percent	Of Next
1939	40%	$50	10%	$200				
1950	50	100	15	200				
1952	55	100	15	200				
1954	55	110	20	240				
1958	58.85	110	21.40	290				
1965	62.97	110	22.90	290	21.40%	$150		
1967	71.16	110	25.88	290	24.18	150	28.43%	$100
1969	81.83	110	29.76	290	27.81	150	32.69	100

[a] Total increased by 1% for each year with at least $200 of creditable wages.

Table 5

MONTHLY BENEFIT INCREASES

Amend-ments	Increase in Benefit Level	Increase in Survivor Percentage of Primary Benefit		
1950	77% overall, from 100% at lowest level to 50% at highest level	Parent:	From 50% To 75%	
		Child:	From 50% To 50% plus 25% divided by number of children in family	
1952	12½%—At least $5			
1954	At least $5			
1958	7% —At least $3			
1960	None	Child:	From 50% plus 25% divided by number of children in family To 75%	
1961	Minimum only	Widow, Widower, and sole surviving parent:	From 75% To 82½%	
1965	7%			
1967	13%			
1969	15%			

Table 6

AVERAGE MONTHLY BENEFIT IN CURRENT-PAYMENT STATUS

	Month	Old-Age Beneficiaries		All Beneficiaries	
		Amount	Increase	Amount	Increase
1950:	August	$26.36		$20.78	
	September	46.62	76.9%	37.67	81.3%
1952:	August	42.36		35.47	
	September	48.79	15.2	40.47	14.1
1954:	August	51.97		43.23	
	September	58.75	13.0	48.98	13.3
1958:	November*	66.35		56.12	
1959:	January	71.40	7.6	60.46	7.7
1960:	November	74.02		62.78	
	December	74.04	—	63.07	.5ᵇ
1961:	July	74.68		63.58	
	August	75.77	1.5	65.02	2.3ᵇ
1965:	August	78.10		67.50	
	Septemberᶜ	83.98	7.5	72.75	7.8
1968:	January	85.50		72.84	
	February	98.25	14.9	83.45	14.6

* December 1958 not available.
ᵇ The increase for certain survivor beneficiaries is averaged over all beneficiaries.
ᶜ The increase, retroactive to January, was effected in September.