



SOCIETY OF ACTUARIES

Article from:

The Actuary

March 1972 – volume 6 - Issue 3

OBSERVATIONS ON THE AUTOMATIC BENEFIT ADJUSTMENT PROVISIONS OF THE SOCIAL SECURITY BILL, H.R. 1

BY A. M. NIESSEN

The provisions of H.R. 1 relating to automatic adjustment of OASDI benefits are commonly referred to as an arrangement for increasing social security benefits according to increases in the cost of living. However, an analysis of the pertinent provisions of the bill shows that the increases would generally be considerably greater than cost-of-living adjustments. In fact, under certain circumstances, the increases would be even slightly in excess of *standard-of-living* adjustments. It is only for beneficiaries already on the rolls and for people who will come onto the benefit rolls in the near future that the increases provided by H.R. 1 would be equivalent to cost of living increases.

justments (beginning with the 1973 computation) will be $W_n = 850(1 + r)^n$, or $850R^n$, where $R = 1 + r$.

2. *Maximum PIA in benefit table.*—Denote the annual increase in the cost of living by j , with $0.03 \leq j < r$. Then the successive maximum PIA's (disregarding the effect of rounding the extensions of the AMW to the nearest multiple of \$25) would be as follows:

$$1973 \text{ computation: } B_1 = 331.20(1 + j) + 0.2(W_1 - W_0),$$

$$1974 \text{ computation: } B_2 = (1 + j)B_1 + 0.2(W_2 - W_1),$$

$$1973 + n \text{ computation: } B_n = (1 + j)B_{n-1} + 0.2(W_n - W_{n-1}).$$

Denoting for convenience $1 + j = J$, we can write

$$B_n = 331.20J^n + 0.2$$

$$\times 850[(R - 1)J^{n-1} + (R^2 - R)J^{n-2} + \dots + (R^n - R^{n-1})].$$

Further, we denote R/J by $I = 1 + i$; since $R - 1 = r$ by definition of R , we can write

$$\begin{aligned} B_n &= 331.20J^n + 170rJ^{n-1}(1 + I + I^2 + \dots + I^{n-1}) \\ &= 331.20J^n + 170rJ^{n-1}S_{\overline{n}|}^{(i)}. \end{aligned}$$

Notes: (a) If $r = 6$ per cent and $j = 3$ per cent, i comes very close to 3 per cent; thus all interest functions in the above expression would be at 3 per cent. (b) If $r = j$, that is, wages increase exactly in the same way as the cost of living, the rate i becomes zero ($i = 0$) and $S_{\overline{n}|} = n$ should be used. If $r < j$, the $S_{\overline{n}|}$ would be replaced by an appropriate $a_{\overline{n}|}$.

3. *PIA based on maximum creditable earnings during period 1974 through 1973 + n.*—The procedure used becomes evident from the computations for $n = 30$ which are shown below.

- a) The AMW on which the benefit will be based is derived from $850(S_{\overline{31}|}^{6\%} - 1)/30$ and equals 2,380.
- b) From $850(1.06)^k = 2,380$, we obtain $17 < k < 18$. This value of k gives the number of revisions after which an AMW of 2,380 appears in the benefit table for the first time.
- c) For $k = 17$, the maximum AMW equals $850(1.06)^{17} = 2,290$. This is 90 short of the 2,380 shown in step *a* above.
- d) The PIA computed in the eighteenth revision would be $1.03B_{17} + 0.2 \times 90$, where B_{17} is computed by means of the formula shown in section 2 above. This PIA comes to 948.
- e) The 948 of step *d* needs to be adjusted for cost-of-living increases during the 12 years between $n = 18$ and $n = 30$. After adjustment we obtain $948(1.03)^{12} = 1,353$. This corresponds to the text figure of 1,351, which was obtained from more precise computations (more decimal places carried).

TABLE 1

	YEAR OF BENEFIT AWARD OR EFFECTIVE YEAR OF TABLE REVISION	
	1983	2003
Number of revisions of benefit table (n)	10	30
Maximum PIA* in benefit table	\$598	\$1,948
Maximum PIA under adjustment for:		
Cost of living only, $331.20(1.03)^n$	445	804
Standard of living, $331.20(1.06)^n$	593	1,902
PIA awarded in year and based on maximum creditable earnings during period 1974 through 1973 + n	527	1,351

* Primary insurance amount.

NOTE.—The formulas underlying the figures in the table are shown below. The PIA's shown in the last line of the table relate to disability or survivor cases where the insured individual will attain age 27 in 1973. The "additional dropout years" provided for in H.R. 1 have been disregarded. In relation to the maximum AMW's (average monthly wages) in 1983 and 2003 (\$1,522 and \$4,882, respectively), the maximum PIA in the benefit table would remain stable, namely, 39 per cent in 1983 and 40 per cent in 2003. However, the ratio of the PIA awarded in the year on the basis of maximum creditable earnings after 1972 to the maximum AMW in the benefit table would decline from 35 per cent for 1983 to 28 per cent for 2003.

The extent of the benefit increases that are likely to occur under the bill will become apparent from the few examples shown here in tabular form (Table 1). The figures were developed on the assumption that from 1972 onward wages will rise at 6 per cent per year and prices at 3 per cent. (This assumption is consistent with the relationships mentioned by Robert J. Myers in his article in the June, 1971, issue of *The Actuary*, col. 3 of p. 4.) To avoid certain technical and computational difficulties, the examples are limited to maximum cases, and rounding provisions have been disregarded. However, the relationships brought out in the table will hold also for nonmaximum cases, although perhaps with some significant modifications.

FORMULAS

1. *Maximum AMW in benefit table.*—If the annual increase in wage levels is r , the maximum AMW after n successive ad-