1977 SOCIAL SECURITY BENEFIT CALCULATIONS

Teaching Session
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- Major feature of the changes

- Detailed calculation of benefits

The new Social Security Law, si⌐n⌐ into effect by President Carter on December 20, 1977, represents ⌐ ⌐atic departure from the course followed by the Social Security prop⌐ ⌐ior to that time. The new law was passed in the wake of numerous st⌐⌐⌐ which showed that the financing of the Social Security system was in ⌐⌐ed of overhaul.

The formula is now based on Social Security earnings which have been indexed to average wages as of the year of a person's 60th birthday. This "indexing" of wages gives more of a "final" average effect to the benefit calculations as opposed to the purely "career" average approach used in the old formula.

Procedure for calculating Social Security benefit:

1. Determine applicable benefit formula based on the year the worker attains age 62:

   - If worker attains age 62 prior to January 1, 1979, calculate Social Security benefit according to the benefit formula in effect prior to the 1977 amendments ("old law").

   - If worker attains age 62 after January 1, 1984, calculate Social Security benefit according to the indexing method of the 1977 amendments ("new law").

   - If worker attains age 62 on or after January 1, 1979 and before January 1, 1984, calculate Social Security benefit of the "new law" and a modification of the "old law," and take the greater of the two benefits.

   The following steps apply to a "new law" calculation:

2. Determine the Social Security taxable earnings of the worker.

3. Index the earnings:

   How to index:

Actual Earnings
for year being
indexed

X

Average Annual Wage
2nd year before age 62,
disability or death
Annual average wage
for year being updated

= Indexed
Earnings

Example:

Worker age 62 in 1979 earned $3,000 in 1956
Average annual wage 1977 = $9,779.44
Average annual wage 1956 = $3,532.36

$$\$3,000 \times \frac{\$9,779.44}{\$3,532.36} = \$8,305.59$$

Index earnings for each year after 1950 through second year before age 62, disability or death.

4. Determine the computation period "n."

   - Same as in the old law calculation

   - MR. GERALD G. TOY pointed out that "n" equals year born plus 6, with a maximum of 35.

5. Calculate AIME (average indexed monthly earnings).

   - Add the highest "n" indexed earnings from step (3).

   - Divide the sum by n x 12.

6. Apply Benefit Formula to AIME for Primary Insurance Amount.

   90% of first $180 AIME, plus
   32% of AIME over $180 through $1,085, plus
   15% of AIME over $1,085

   - The Bend Points ($180 and $1,085) will be adjusted in the future to reflect average wage increases.

   - The Percentages will not change.

7. Apply CPI increases.

   - The Primary Insurance Amount (PIA) is increased according to the CPI only after the year of eligibility.

   example:
     If a worker applies for a benefit at age 65, the PIA is increased 3 times, for the CPI increases between the worker's age 62 and age 65.

     If a worker applies for a benefit at age 62 the PIA is not increased.

The tables and graphs which follow illustrate differences in Social Security replacement percentages for persons reaching age 65 in 1979 or later years.

The replacement percentages were calculated by dividing initial Social Secu-
rity benefit amounts by pay in the last year worked. Replacement percentages
under the Social Security Act, as in effect before passage of the new law, are
plotted with an "O," while the percentages replaced under the new formula
are plotted using an "N."

The table/graphs were calculated under three different "scenarios," each one
defined by its Salary Scale, Wage Base Index and Consumer Price Index assump-
tion.

The first two scenarios are assumptions taken from the 1977 Report of the
Board of Trustees of Social Security Trust funds. The assumptions of the
third scenario are taken from an actuarial study, Long-Range Cost Estimates
for OASDI System, 1978 (Department of HEW).

	Scenario I Annual Percentage Increase		Scenario II Annual Percentage Increase		Scenario III Annual Percentage Increase	
	Wages	CPI	Wages	CPI	Wages	CPI
1977	8.4	6.0	8.4	6.0		
1978	8.2	5.3	8.1	5.4	7.24	6.12
1979	7.9	4.6	7.8	5.3	8.18	6.80
1980	6.6	4.1	7.1	4.7	7.40	7.10
1984	5.25	3.0	5.75	4.0	6.99	5.45
1990	5.25	3.0	5.75	4.0	6.48	5.0
2000	5.25	3.0	5.75	4.0	6.25	5.0

It is interesting to note that the widest divergence between old and new
benefit levels occurs within the lower paid groups. This is largely attri-
butable to two factors. One of these is that the entire income of persons
in this group would be included in the "Average Monthly Wage" figure under
the old formula; the other is that indexing for inflation in the benefit
formula and the actual impact of inflation on such wages causes the benefit
percentage, even on the first few hundred dollars of Average Monthly Wages,
to increase geometrically, pushing it closer and closer to 100%.

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                                                                    SCENARIO 1


              COMPARISON OF OLD AND NEW SOCIAL SECURITY BENEFITS AT AGE 65

                         CURRENT EARNINGS =    5000.00


REPLACEMENT                     YEAR AGE 65 IS ATTAINED
RATIO
        7 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 0 0 0 0 0 0 0 0 0 0 1 1 1 1
        9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3
        -----------------------------------------------------------------------
80---                                                                     ---80
78---                                                                     ---78
76---                                                                0 ---76
74---                                                  O O O O O O       ---74
72---                                      O O O O O O                   ---72
70---                          O O O O O                                 ---70
68---                        O                                           ---68
66---                     O                                              ---66
64---                  O                                                 ---64
62---             O O O O                                                ---62
60---O O O O O O O O O O O O O                                           ---60
58---                                                                    ---58
56---                                                                    ---56
54---      N    N N N N N                                                ---54
52---       N              N N N N N N                                   ---52
50---                            N N N N N N N N N                        ---50
48---                                            N N N N N N N N N ---48
46---                                                                    ---46
44---                                                                    ---44
42---                                                                    ---42
40---                                                                    ---40
38---                                                                    ---38
36---                                                                    ---36
34---                                                                    ---34
32---                                                                    ---32
30---                                                                    ---30
28---                                                                    ---28
26---                                                                    ---26
24---                                                                    ---24
22---                                                                    ---22
20---                                                                    ---20
18---                                                                    ---18
16---                                                                    ---16
14---                                                                    ---14
12---                                                                    ---12
10---                                                                    ---10
 8---                                                                    --- 8
 6---                                                                    --- 6
 4---                                                                    --- 4
 2---                                                                    --- 2
        -----------------------------------------------------------------------
        6 6 6 6 6 6 5 5 5 5 5 5 5 5 5 5 4 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3 3
        5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1

                              CURRENT AGE

    O IS REPLACEMENT RATIO FOR OLD LAW   ASSUMPTIONS: 1) SALARY SCALE-6.5%
    N IS REPLACEMENT RATIO FOR NEW LAW   -----------  2) WAGE BASE INCREASE-SEN1
    * APPEARS WHEN THE TWO ARE EQUAL                  3) CPI INCREASE-SEN1
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                                                            SCENARIO 2


          COMPARISON OF OLD AND NEW SOCIAL SECURITY BENEFITS AT AGE 65

                     CURRENT EARNINGS =   5000.00


REPLACEMENT                   YEAR AGE 65 IS ATTAINED
RATIO
      7 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 0 0 0 0 0 0 0 0 0 0 1 1 1 1
      9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3
      ------------------------------------------------------------------------
80---                                       O  O                         ---80
78---                                                                    ---78
76---                                     O                              ---76
74---                                   O                                ---74
72---                                 O                                  ---72
70---                               O                                    ---70
68---                             O  O                                   ---68
66---                       O  O  O                                      ---66
64---                 O  O  O  O                                         ---64
62---     O  O  O  O  O                                                  ---62
60---O                                                                   ---60
58---                                                                    ---58
56---        N                                                           ---56
54---              N  N  N  N                                            ---54
52---           N              N  N  N  N  N  N  N  N                     ---52
50---                                      N  N  N  N  N  N  N  N  N  N   ---50
48---                                                      N  N  N  N  N  ---48
46---                                                                    ---46
44---                                                                    ---44
42---                                                                    ---42
40---                                                                    ---40
38---                                                                    ---38
36---                                                                    ---36
34---                                                                    ---34
32---                                                                    ---32
30---                                                                    ---30
28---                                                                    ---28
26---                                                                    ---26
24---                                                                    ---24
22---                                                                    ---22
20---                                                                    ---20
18---                                                                    ---18
16---                                                                    ---16
14---                                                                    ---14
12---                                                                    ---12
10---                                                                    ---10
 8---                                                                    --- 8
 6---                                                                    --- 6
 4---                                                                    --- 4
 2--                                                                     --- 2
      ------------------------------------------------------------------------
      6 6 6 6 6 6 5 5 5 5 5 5 5 5 5 5 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3 3
      5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1
                              CURRENT AGE

     O IS REPLACEMENT RATIO FOR OLD LAW   ASSUMPTIONS: 1) SALARY SCALE-7.0%
     N IS REPLACEMENT RATIO FOR NEW LAW   -----------  2) WAGE BASE INCREASE-SEN2
     * APPEARS WHEN THE TWO ARE EQUAL                  3) CPI INCREASE-SEN2
```
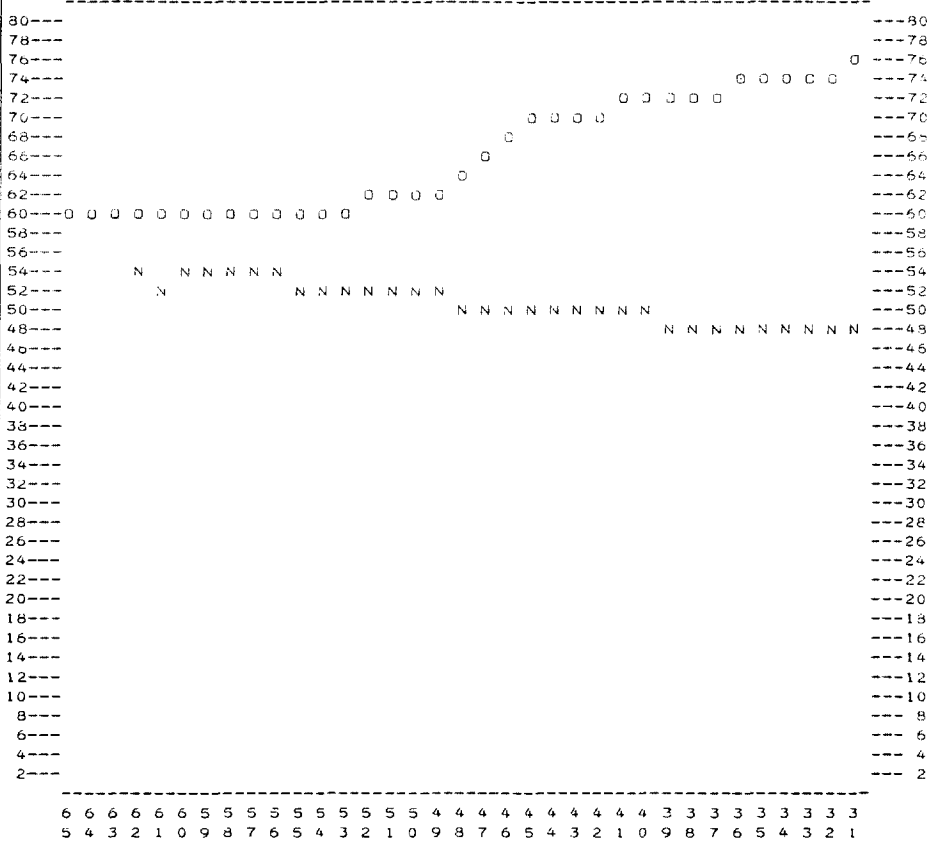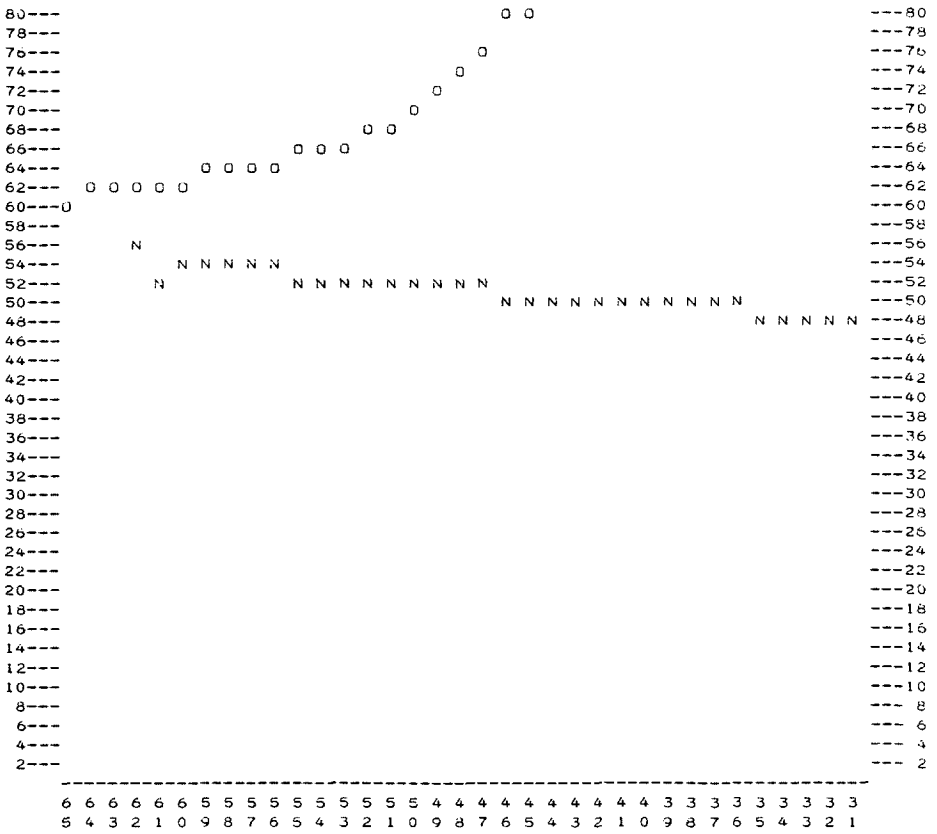
```
                                                              SCENARIO 3


          COMPARISON OF OLD AND NEW SOCIAL SECURITY BENEFITS AT AGE 65

                      CURRENT EARNINGS =    7500.00


REPLACEMENT                    YEAR AGE 65 IS ATTAINED
RATIO
      7 8 8 8 8 8 8 8 6 8 8 9 9 9 9 9 9 9 9 9 9 0 0 0 0 0 0 0 0 0 0 1 1 1 1
      9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3
      ---------------------------------------------------------------------
80---                                                                  ---80
78---                                                                  ---78
76---                                                                  ---76
74---                                                           O  --74
72---                                                     O  O  O    ---72
70---                                                  O  O          ---70
68---                                              O  O  O           ---68
66---                                     O  O  O  O                 ---66
64---                                 O  O  O                        ---64
62---                           O  O  O                              ---62
60---                   O  O  O  O  O                                ---60
58---                O  O                                            ---58
56---          O  O  O  O                                            ---56
54---       O  O                                                     ---54
52---    O  O                                                        ---52
50---O                                                               ---50
48---                                                                ---48
46---       N                                                        ---46
44---    N  N  N  N  N  N  N  N                                      ---44
42---                N  N  N  N  N  N  N  N  N  N                    ---42
40---                               N  N  N  N  N  N  N  N           ---40
38---                                                 N  N  N  ---38
36---                                                                ---36
34---                                                                ---34
32---                                                                ---32
30---                                                                ---30
28---                                                                ---28
26---                                                                ---26
24---                                                                ---24
22---                                                                ---22
20---                                                                ---20
18---                                                                ---18
16---                                                                ---16
14---                                                                ---14
12---                                                                ---12
10---                                                                ---10
 8---                                                               --- 8
 6---                                                               --- 6
 4---                                                               --- 4
 2---                                                               --- 2
      ---------------------------------------------------------------------
      6 6 6 6 6 6 6 5 5 5 5 5 5 5 5 5 5 4 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3
      5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1

                              CURRENT AGE

    O IS REPLACEMENT RATIO FOR OLD LAW   ASSUMPTIONS: 1) SALARY SCALE-7.5%
    N IS REPLACEMENT RATIO FOR NEW LAW   -----------  2) WAGE BASE INCREASE-SEN3
    * APPEARS WHEN THE TWO ARE EQUAL                  3) CPI INCREASE-SEN3
```
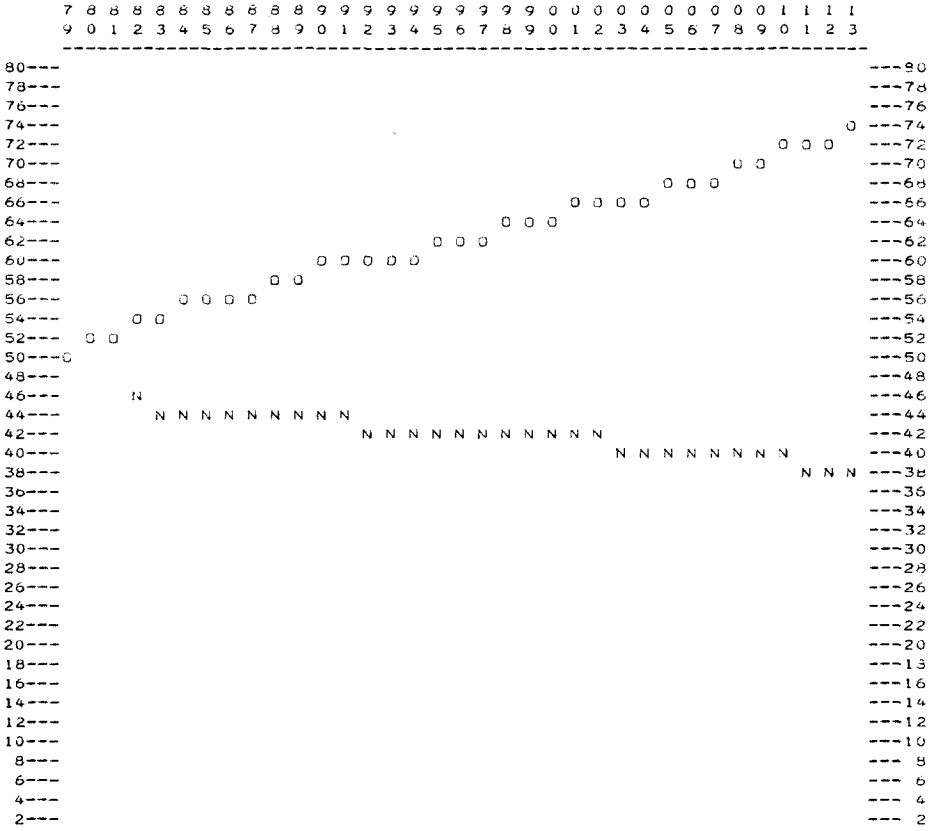
```
                                                        SCENARIO 3


        COMPARISON OF OLD AND NEW SOCIAL SECURITY BENEFITS AT AGE 65

                   CURRENT EARNINGS =  25000.00


REPLACEMENT                   YEAR AGE 65 IS ATTAINED
RATIO
     7 8 8 8 8 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 0 0 0 0 0 0 0 0 0 0 1 1 1 1
     9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3
     ---------------------------------------------------------------------
80---                                                               ---80
78---                                                               ---78
76---                                                               ---76
74---                                                               ---74
72---                                                               ---72
70---                                                               ---70
68---                                                               ---68
66---                                                               ---66
64---                                                               ---64
62---                                                               ---62
60---                                                               ---60
58---                                                               ---58
56---                                                               ---56
54---                                                               ---54
52---                                                               ---52
50---                                                               ---50
48---                                                               ---48
46---                                                               ---46
44---                                                               ---44
42---                                                               ---42
40---                                                               ---40
38---                                                               ---38
36---                                                               ---36
34---                                                               ---34
32---                                        O O O O O O O O O O    ---32
30---                              O O O O O O O O                  ---30
28---           O O O O O O O O O O O O O                           ---28
26---       O O O O                                                 ---26
24---O O                                                            ---24
22---     N N N N N N N N N N N N N N N N N N N                      ---22
20---                                    N N N N N N N N N N N N N   ---20
18---                                                               ---18
16---                                                               ---16
14---                                                               ---14
12---                                                               ---12
10---                                                               ---10
 8---                                                               --- 8
 6---                                                               --- 6
 4---                                                               --- 4
 2---                                                               --- 2
     ---------------------------------------------------------------------
     6 6 6 6 6 6 5 5 5 5 5 5 5 5 5 5 4 4 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3 3
     5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1

                            CURRENT AGE

     O IS REPLACEMENT RATIO FOR OLD LAW   ASSUMPTIONS: 1) SALARY SCALE-7.5%
     N IS REPLACEMENT RATIO FOR NEW LAW   -----------  2) WAGE BASE INCREASE-SEN3
     * APPEARS WHEN THE TWO ARE EQUAL                  3) CPI INCREASE-SEN3
```

Stability of Replacement Ratios under the Social Security law prior to the 1977 amendments:

The benefit formula of the old law was in the following form:

k_1% of average monthly wage up to $\$w_1$
k_2% of next $\$w_2$
k_3% of next $\$w_3$
,
,
,

k_n% of the remaining average monthly wage

The replacement ratios under the old law would remain stable only under one set of circumstances. The ratio of the replacement ratio to k_n would have to equal a set function of the wage base and CPI increase.

MR. JAMES P. WALSH has submitted the following demonstration that the replacement ratios under the old law remain stable when

$$\frac{\text{replacement ratio}}{k_n} = \frac{\text{wage base}}{\text{wage base increase-CPI increase}}$$

year
x

assume AMW $= w_1 + w_2 + w_3$

Formula: k_1 of first $\$w_1$
k_2 of next $\$w_2$
k_3 of next $\$w_3$

then PIA $= k_1 w_1 + k_2 w_2 + k_3 w_3$

and replacement ratio $= \dfrac{k_1 w_1 + k_2 w_2 + k_3 w_3}{w_1 + w_2 + w_3}$

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x+1   assume that the wage base increases at a rate of r
and CPI increases at a rate of s

then the new formula is $(1+s)k_1$ of $\$w_1$
$(1+s)k_2$ of $\$w_2$
$(1+s)k_3$ of $\$w_3$
k_3 of $r(w_1 + w_2 + w_3)$

AMW $= (1+r)(w_1 + w_2 + w_3)$
PIA $= (1+s)(k_1 w_1 + k_2 w_2 + k_3 w_3) + k_3 r(w_1 + w_2 + w_3)$
and replacement ratio $= \dfrac{(1+s)(k_1 w_1 + k_2 w_2 + k_3 w_3) + k_3 r(w_1 + w_2 + w_3)}{(1+r)(w_1 + w_2 + w_3)}$

and if the two replacement ratios are equal

$$\frac{k_1 w_1 + k_2 w_2 + k_3 w_3}{w_1 + w_2 + w_3} = \frac{(1+s)(k_1 w_1 + k_2 w_2 + k_3 w_3) + k_3 r (w_1 + w_2 + w_3)}{(1+r)(w_1 + w_2 + w_3)}$$

which implies: $\left(\dfrac{k_1 w_1 + k_2 w_2 + k_3 w_3}{w_1 + w_2 + w_3} \right) \dfrac{1}{k_3} = \dfrac{r}{r-s}$

$$\left(\frac{\text{replacement ratio for year}}{k_3} \right) = \frac{r}{r-s}$$