POLICY
SOCIAL SECURITY
ADMINISTRATION

Distribution of Zero-Earnings Years
by Gender, Birth Cohort, and Level of Lifetime Earnings[*]

This note uses data from the Modeling Income in the Near Term (MINT) project to estimate the distribution of zero-earnings years by gender, birth cohort, and level of lifetime earnings from 1951 through 1996. MINT projects the earnings patterns and retirement outcomes of persons born between 1926 and 1965 using data from the 1990-1993 panels of the Survey of Income and Program Participation (SIPP) matched to Social Security Administration earnings records.[1] Workers are included in the analysis whether or not they have enough quarters of covered employment to be insured for Social Security retirement benefits. The analysis is focused mainly on zero-earnings years that fall within a worker's highest 35 years of earnings, because only these years are used in the calculation of benefits.[2]

To assess the validity of the MINT data, we compared estimates from MINT with similar tabulations from the Continuous Work History Sample of administrative records for the 1934-1936 birth cohort.[3] These comparisons are described in the appendix. Although the two data sources yield fairly similar results, the comparability of these sources for the 1934-1936 cohort does not validate the results presented for later birth cohorts, for which the MINT model provides only a forecast of the number of years of zero earnings.[4] Since this forecast is based on each worker's existing earnings record, there is greater uncertainty about the future earnings patterns of younger workers. In the current version of MINT, labor force participation is not forecast independently of earnings. Thus, according to the Urban Institute, "The method produces too few predictions of consistently low or zero earnings, especially among workers nearing typical ages of retirement. In policy simulations where the exact number of years with

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[1] For a description of the MINT model, see Barbara A. Butrica and Howard M. Iams, "Projecting Retirement Income of Future Retirees with Panel Data: Results from the Modeling Income in the Near Term (MINT) Project," *Social Security Bulletin*, vol. 62, no. 4 (1999), pp. 3-8. The article is available on-line at http://www.ssa.gov/policy/pubs/SSB/v62n4y1999/index.html.

[2] Because of uncertainty about the future earnings patterns of those born between 1961-1965, these individuals are omitted from this analysis. The sample also excludes those who died or received disability benefits before retirement, or those who are projected to do so.

[3] The 1934-1936 cohort is not an actual baseline for MINT. However, it does represent a group that had completed most of its earnings history at the time it was surveyed in the 1990-1993 panels of the SIPP, which provide the basic data for the MINT model.

[4] These forecasts may not be consistent with the projections of the Trustees of the Social Security and Medicare Trust Funds because of differences in data sources and methodology.

positive earnings is important, . . . this shortcoming can represent a serious problem."[5] The Urban Institute is currently developing a new method of projecting earnings that will deal with this limitation.

A summary of the projected mean, median, and distribution of zero-earnings years, by gender for the overall sample and for the Depression/World War II and baby-boom cohorts is provided in Table 1. The data in the table are restricted to zero-earnings years within a worker's highest 35 years, which are those included in the Social Security benefit calculation. Within the overall sample, the average number of zero-earnings years was 5.7, as shown in the last column of the table. The median worker, however, did not have any years of zero earnings. The reason for the large discrepancy between the mean and median is the severe skewness in the distribution of zero-earnings years. Although just over 60 percent of workers had no zero-earnings years at all, 7 percent had more than 25 years of zero earnings. Many of those with high numbers of zero-earnings years would not have enough quarters of coverage to qualify for retirement benefits under current Social Security program rules.

The overall figures mask a substantial differential by gender: women averaged 7.7 years of zero earnings, while men averaged just 3.2 years. This differential is much less pronounced with respect to the median, but is readily apparent in the distribution of zero earnings years. Seventy-five percent of men, but less than 50 percent of women, had no years of zero earnings. At the same time, more than 10 percent of women, but less than 4 percent of men, had more than 25 years of zero earnings. The gender differential was especially pronounced for those born in the Depression and World War II era. Women averaged 12.5 years of zero earnings, with a median of 10 years, while men averaged just 3.7 years, with no years of zero earnings for the median male worker. By contrast, the projected average number of zero-earnings years for men and women within the baby-boom cohort differed by less than a year, and both groups had a median of zero years. That projected narrowing of the gender gap resulted from a substantial reduction in the average number of zero-earnings years among women. Since the average declined for men as well, the baby boom cohort as a whole was projected to accrue an average of just 3.3 years of zero earnings, compared with 8.6 years for the Depression/World War II cohort.

The projected incidence of zero-earnings years is greatly expanded when the entire period from age 22 to the year before retirement is taken into account, as shown in Table 2. Using that measure, the average number of zero-earnings years was 10.1, well above the 5.7-year average when only the top 35 years of earnings were considered. Similarly, while 60 percent of workers have at least 35 years of positive earnings, only 26 percent have a continuous work history from age 22 to retirement. The trends observed above—a decline in the prevalence of zero-earnings years in the baby-boom cohort and a narrowing of the gender gap—are mirrored in Table 2.

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[5] Eric Toder and others, *Modeling Income in the Near Term—Projections of Retirement Income Through 2020 for the 1931-1960 Birth Cohorts*, Washington: Urban Institute, September 1999, p. 30. Available on-line at http://www.ssa.gov/policy/policyareas/evaluation/MINT/UI/index.html.

Another major feature of the distribution of zero-earnings years is the huge differential by level of lifetime earnings (Table 3).[6] Those in the lowest quartile of lifetime earnings averaged 18.3 years of zero earnings, compared to just 0.1 year for those in the highest quartile. The disparity in the prevalence of zero-earnings years is projected to diminish in the baby-boom cohort relative to the Depression/World War II cohort. However, that result may stem from the difficulty of forecasting future labor force participation, a problem that disproportionately affects the projections for low earners, who are more loosely attached to the labor force.

Overall, this analysis indicates that women and those workers with low lifetime earnings tend to spend more years out of the labor force than others. Projections for the baby boom cohort suggest that those gaps may be narrowing, but the results must be interpreted with considerable caution.

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[6] Lifetime earnings are determined from a worker's average indexed monthly earnings (AIME), the measure of earnings used to determine a worker's Social Security benefit amount.

Table 1.

Number of observations and projected number and percentage distribution of years of zero earnings within highest 35 years, by gender and birth cohort

Years of zero earnings	Total	Men	Women
	Overall sample, born 1926-1960		
Number of observations, total	48,776	21,207	27,569
Projected years			
Mean	5.7	3.2	7.7
Median	0	0	1.0
Percentage distribution, total	100.0	100.0	100.0
0	60.3	75.9	47.5
1-5	9.8	6.8	12.3
6-10	7.4	4.2	10.0
11-15	6.1	3.6	8.1
16-20	4.9	3.1	6.5
21-25	4.3	3.0	5.4
More than 25	7.2	3.4	10.2
	Depression and W.W. II cohorts, born 1926-1945		
Number of observations, total	22,923	10,024	12,899
Projected years			
Mean	8.6	3.7	12.5
Median	2.0	0	10.0
Percentage distribution, total	100.0	100.0	100.0
0	47.5	72.5	27.1
1-5	10.6	7.9	12.7
6-10	8.2	4.4	11.4
11-15	7.8	4.2	10.6
16-20	6.9	3.6	9.6
21-25	6.3	3.2	8.9
More than 25	12.7	4.1	19.8

(Continued)

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Table 1.
Continued

Years of zero earnings	Total	Men	Women
	Baby-boom cohort, born 1946-1960		
Number of observations, total	25,853	11,183	14,670
Projected years			
Mean	3.3	2.8	3.7
Median	0	0	0
Percentage distribution, total	100.0	100.0	100.0
0	71.2	78.8	65.0
1-5	9.2	5.9	11.9
6-10	6.6	4.0	8.8
11-15	4.7	3.1	6.0
16-20	3.3	2.6	3.8
21-25	2.6	2.8	2.4
More than 25	2.4	2.9	2.1

NOTE: All data are weighted except for number of observations.

Table 2.
Number of observations and projected number and percentage distribution of years of zero earnings between age 22 and retirement, by gender and birth cohort

Years of zero earnings	Total	Men	Women
Overall sample, born 1926-1960			
Number of observations, total	48,776	21,207	27,569
Projected years			
Mean	10.1	6.6	13.0
Median	5.0	2.0	10.0
Percentage distribution, total	100.0	100.0	100.0
0	26.4	38.9	16.3
1-5	24.5	29.9	20.1
6-10	12.7	9.5	15.3
11-15	9.2	5.5	12.3
16-20	7.5	4.1	10.2
21-25	5.6	3.4	7.4
More than 25	14.1	8.8	18.4
Depression and W.W. II cohorts, born 1926-1945			
Number of observations, total	22,923	10,024	12,899
Projected years			
Mean	13.5	7.1	18.7
Median	10.0	2.0	17.0
Percentage distribution, total	100.0	100.0	100.0
0	18.4	34.1	5.6
1-5	21.6	32.5	12.8
6-10	12.1	10.1	13.8
11-15	10.0	5.7	13.5
16-20	8.5	4.4	11.9
21-25	7.3	3.9	10.1
More than 25	22.0	9.4	32.3

(Continued)

Table 2.
Continued

Years of zero earnings	Total	Men	Women
	Baby-boom cohort, born 1946-1960		
Number of observations, total	25,853	11,183	14,670
Projected years			
Mean	3.3	2.8	3.7
Median	0	0	0
Percentage distribution, total	100.0	100.0	100.0
0	33.3	42.9	25.4
1-5	27.0	27.7	26.4
6-10	13.2	9.1	16.5
11-15	8.6	5.3	11.4
16-20	6.6	3.8	8.8
21-25	4.1	2.9	5.1
More than 25	7.3	8.3	6.5

NOTE: All data are weighted except for number of observations.

Table 3.
Average number of projected years of zero earnings within highest 35 years, by lifetime earnings quartile and birth cohort

Earnings quartile[a]	Overall sample, born 1926-1960	Depression and W.W. II cohorts, born 1926-1945	Baby-boom cohort, born 1946-1960
Lowest	18.3	22.8	12.9
Second	3.8	6.1	1.9
Third	0.6	1.1	0.2
Highest	0.1	0.1	0.1

a. Average indexed monthly earnings.

Appendix
Comparison of the MINT and CWHS Samples
for the 1934-1936 Birth Cohorts

The Continuous Work History Sample (CWHS) provides a good basis for comparison with the early cohorts of the Modeling Income in the Near Term (MINT) model. Both datasets contain information on earnings from the Social Security Administration's (SSA's) Master Earnings File, though they rely upon different samples. The CWHS utilizes a 1 percent sample of all Social Security numbers, while the sample used within the MINT model comes from the 1990-1993 panels of the Survey of Income and Program Participation (SIPP) sample. The SIPP is designed to provide a random sample of the population, which is then matched to SSA records to obtain information such as past earnings histories. Similar selection criteria were applied to both datasets: workers were only included if they were fully insured for retirement benefits at the time of selection and had not died or become disabled before that time. The CWHS selection occurred at age 62; MINT selection occurred in the projected year of retirement. That means that a few years of projections are included in the MINT data, because most of those in the 1934-1936 birth cohorts had not retired as of 1996, the last available year of earnings data from Social Security records.

A comparison of data from the 1934 cohort of the CWHS, the 1936 cohort of the CWHS, and the 1934-1936 cohort of the MINT model is shown in the appendix table. Overall, the samples are fairly similar, although the average number of zero-earnings years reported in MINT is lower than in either of the CWHS samples, especially among males.

Table A-1.
Number and percentage distribution of years of zero
earnings by gender: CWHS vs. MINT[a]

Years of zero earnings	CWHS: 1934 cohort	CWHS: 1936 cohort	MINT: 1934-1936 cohort
Total			
0-4	65	66	68
5-9	12	12	12
More than 9	24	22	20
Mean	4.77	4.48	4.13
Men			
0-4	80	81	85
5-9	7	7	6
More than 9	13	13	9
Mean	2.62	2.57	1.95
Women			
0-4	46	49	51
5-9	17	18	18
More than 9	36	33	31
Mean	7.24	6.71	6.39

a. These data are restricted to fully insured workers and only include
    years of zero earnings within a worker's highest 35 years. The
    CWHS sample excludes workers who died or became disabled
    before age 62; MINT excludes workers who died or became
    disabled before retirement.