ACTUARIAL NOTE
Number 2024.3
May 2024

SOCIAL SECURITY ADMINISTRATION
Office of the Chief Actuary
Baltimore, Maryland

SCALED FACTORS FOR HYPOTHETICAL EARNINGS EXAMPLES UNDER THE 2024 TRUSTEES REPORT ASSUMPTIONS

by Kyle Burkhalter, FSA, and Karen Rose, ASA

1. Introduction

The Office of the Chief Actuary (OCACT) has traditionally used hypothetical earnings patterns to illustrate a range of benefit levels, replacement rates, money's worth measures, and internal rates of return under the Social Security program. OCACT has long used these illustrations to evaluate the program under current law. In addition, in recent years, these hypothetical earnings patterns have formed the basis for illustrating the effects of possible program changes on benefit levels.[1]

Between 2001 and 2004, OCACT developed *scaled worker* hypothetical earnings patterns for four different career-average earnings levels. These patterns express the hypothetical earnings at each age as a percent of the Social Security Administration's national average wage index (AWI).[2] Each of the four scaled patterns derives from one set of raw scaled factors based on average work and earnings of actual insured workers over their careers. At each age, the raw scaled factor reflects both the average earnings level of those who worked at that age and the percent of insured workers who actually worked at that age.

This note presents the four sets of scaled worker factors recently updated for the hypothetical very low, low, medium, and high lifetime earnings examples used in table V.C7 of the 2024 Trustees Report. Table 6 shows these final scaled factors. In many office publications, OCACT also includes a hypothetical "maximum" earner with earnings equal to the OASDI maximum taxable earnings level for each year. The scaled worker hypothetical earnings patterns and the maximum earner pattern provide a wide range of career taxable earnings levels under the Social Security program.

Prior to the development of *scaled workers*, OCACT generally used hypothetical *steady workers,* who earn a constant percentage of the AWI each year throughout their careers. These hypothetical steady earnings patterns tended to over-represent the proportion of actual lifetime earnings received at younger and older ages, and under-represent the proportion received at prime working ages for most workers.

In developing these four sets of scaled factors, we initially develop one set of *raw scaled factors* using earnings from the Continuous Work History Sample (CWHS). We make a preliminary adjustment to these raw factors for ages 62 and older to account for the select nature of these workers who continue working at such ages. Then, these *preliminary adjusted scaled factors* are further adjusted so that the resulting *career-average earnings levels*[3] are 25 percent, 45 percent, 100 percent, and 160 percent of the AWI for the very low, low, medium, and high hypothetical workers, respectively. We select these career-average earnings levels in order to provide both a representative range of examples and continuity with previous estimates for hypothetical workers.

Table 1 compares overall earnings for these hypothetical workers to those of actual retiring workers.[4] We use the Average Indexed Monthly Earnings[5] (AIME), which is based on a worker's earnings, as a measure of overall earnings. We develop the distribution of actual workers retiring in 2018 through 2023 from 1 percent samples of Social Security administrative records.

[1] Refer to the February 2, 2011 letter from Stephen C. Goss for an example of this illustrative benefits analysis. This letter is located at: http://www.ssa.gov/OACT/solvency/BowlesSimpsonRivlinDomenici_20110202.pdf.

[2] For more information on the national average wage index, including historical values, see: http://www.ssa.gov/OACT/COLA/AWI.html.

[3] We define *career-average earnings* as the average of the highest 35 years of earnings, indexed for growth in average wages to the year prior to benefit entitlement. See further discussion under subsection 3.b. We introduced the *career-average earnings* concept with the 2002 Trustees Report.

[4] For purposes of this Actuarial Note, "actual retiring workers" are workers who begin receiving their retired worker benefit.

[5] See http://www.ssa.gov/OACT/COLA/Benefits.html#aime for more details on how to calculate the AIME.

Table 1.---Distribution of AIMEs of Actual Workers Retiring in Years 2018 to 2023, Relative to AIMEs for Hypothetical Workers Retiring in 2023

Hypothetical worker[1] (Career-average earnings)[2]	Percent with AIME less than AIME for hypothetical case			Percent with AIME closest to AIME for hypothetical case[3]		
	All men	All women	Total, all workers	All men	All women	Total, all workers
Very Low ($15,861)	8.1	15.1	11.6	12.5	23.1	17.8
Low ($28,549)	16.7	31.2	24.0	16.6	29.4	23.0
Medium ($63,443)	43.4	70.0	56.7	29.9	30.5	30.2
High ($101,509)	72.1	90.7	81.4	26.7	13.7	20.2
Maximum ($156,927)	100.0	100.0	100.0	14.4	3.3	8.8

[1] See text for definition of hypothetical workers.

[2] Career-average earnings of hypothetical scaled workers retiring at age 62 in 2023. Earnings are wage indexed to 2022 in this calculation.

[3] Rounded values do not necessarily sum to 100 percent. The percentage of workers with AIME values closest to that of the hypothetical maximum worker is expected to decline in future years. This is due to a significant increase in the OASDI maximum taxable earnings, relative to the AWI, in 1981 and a smaller increase in 1990.

Note: Worker distributions include individuals who are dually entitled, or may become dually entitled to a higher benefit in the future, based on another worker's account.

Table 1 shows that 31.2 percent of female workers retiring in 2018 through 2023 have AIMEs below that of a hypothetical low wage scaled worker and that about 41 percent of all workers retiring in 2018 through 2023 have AIMEs closest to that of hypothetical low or very low wage scaled workers.

Dually entitled workers are insured for worker benefits, but are entitled to a larger benefit as a dependent on another worker's account (generally as a spouse or widow(er)) than they are entitled to as a worker beneficiary only. A significant proportion of entitled female workers, especially those with lower earnings, will be entitled to higher benefits as aged spouse or aged widow beneficiaries. If we excluded such dually entitled workers from this analysis, a higher percentage of the remaining workers would have earnings closer to the higher-level hypothetical workers.

2. Developing Raw Scaled Factors from Earnings in the CWHS

The raw scaled factors are developed in three steps:

- Select workers in the CWHS for computing the factors;
- Tabulate the earnings for these workers; and
- Develop the raw scaled factors from the tabulated earnings.

a. Select Workers in the CWHS for Computing the Factors

The CWHS is a 1-percent sample of workers with some OASDI taxable earnings during their lifetime. The Office of the Chief Information Officer updates it annually based on specifications from the Office of Research, Evaluation, and Statistics. We develop the factors in this actuarial note using the CWHS containing earnings data through 2021. The CWHS contains earnings for all workers in the sample. It is important to limit analysis to the following groups of workers: those who are likely to be eligible for retirement or disability benefits, and those who are likely to have dependents eligible for survivor benefits. To include only those workers, we used the status of *fully insured*. A worker is considered fully insured if he or she has a total number of quarters of coverage (QCs)[6] at least equal to the number of years after attainment of age 21 through the last year considered in the analysis (in this case 2020). A further requirement is that the worker must have a minimum of 6 QCs. Because a worker achieves *permanent insured* status with 40 QCs, any worker with 40 QCs is fully insured no matter how many years have elapsed since age 21. Any *fully insured* worker is likely to become eligible for a Social Security retirement benefit if he or she survives to eligibility age.

[6] The QC is the basic unit for determining whether a worker is insured for Social Security benefits. In 2024, for example, a worker needed to have $1,730 in covered earnings to obtain a QC. Workers can earn up to 4 QCs per calendar year. Since 1978, the amount of covered earnings required to obtain a QC has been automatically indexed each year with the growth in the AWI. See http://www.ssa.gov/OACT/COLA/QC.html for more information, including a list of historical QC amounts.

b. Tabulate Earnings for These Workers

The updated CWHS file contains taxable earnings for years 1951 through 2021. Due to posting delays, the earnings for 2021 in this file are less complete than for earlier years and were not used in our analysis. For each of the workers classified as fully insured as of 2020 (based on all earnings after 1950), our analysis includes earnings for the most recent 20-year period (2001 through 2020) for ages 21 and older. We classify earnings by age of worker, and express earnings as their ratio to the AWI for the specific year.

OCACT develops scaled factors taking into account both the variations in earnings by age and the probabilities that workers may have years with zero earnings. The earnings records selected include years with zero earnings, but not years in which the worker was deceased[7] or receiving a retired-worker or disabled-worker Social Security benefit.

c. Develop Raw Scaled Factors from the Tabulated Earnings

To normalize earnings from different years, annual earnings amounts for each year are divided by the AWI for that year. For each fully insured worker, normalized earnings are tabulated by age for each age 21 and older for years 2001 through 2020. The normalized earnings are summed by age and a corresponding worker count is kept. The raw scaled factors are determined by dividing the tabulated sum for each age, including years with zero earnings, by the corresponding numbers of workers. Table 2 displays the results.

Table 2.---Raw Scaled Worker Factors for the 2024 Trustees Report

Age	Percent with Earnings	Average earnings as % of AWI for those with earnings	Factor
21	0.819	0.280	0.230
22	0.835	0.339	0.283
23	0.846	0.426	0.360
24	0.850	0.506	0.430
25	0.851	0.569	0.485
26	0.852	0.625	0.533
27	0.853	0.677	0.577
28	0.853	0.724	0.618
29	0.853	0.766	0.653
30	0.851	0.805	0.686
31	0.851	0.840	0.715
32	0.849	0.871	0.740
33	0.848	0.898	0.762
34	0.848	0.922	0.782
35	0.848	0.943	0.799
36	0.848	0.960	0.814
37	0.848	0.976	0.828
38	0.849	0.989	0.839
39	0.850	1.000	0.850
40	0.850	1.011	0.859
41	0.850	1.020	0.868
42	0.850	1.029	0.875
43	0.851	1.036	0.881
44	0.851	1.043	0.887
45	0.850	1.050	0.892
46	0.848	1.056	0.896
47	0.847	1.061	0.898
48	0.844	1.065	0.899
49	0.842	1.068	0.899
50	0.839	1.071	0.899
51	0.836	1.072	0.896
52	0.832	1.073	0.892
53	0.827	1.073	0.887
54	0.821	1.072	0.880
55	0.815	1.068	0.871
56	0.807	1.057	0.854
57	0.797	1.046	0.834
58	0.786	1.034	0.812
59	0.772	1.021	0.788
60	0.755	1.001	0.756
61	0.730	0.976	0.713
62	0.782	1.083	0.847
63	0.782	1.112	0.870
64	0.768	1.118	0.859

[7] Data concerning worker deaths appears in the CWHS. However, death data in the CWHS does not include all state-reported death data. Therefore, we also used Social Security's NUMIDENT file to identify deaths of individuals in the CWHS. The NUMIDENT file contains, among other things, death data including state-reported deaths.

3. Adjust Raw Scaled Factors to Match Selected Career-Average Earnings Levels

The raw scaled factors are adjusted in three steps:

- Calculate preliminary adjusted scaled factors from the raw scaled factors by overriding the scaled factors at ages 62 through 64;
- Construct the earnings pattern and calculate the career-average earnings for a hypothetical scaled worker using the preliminary adjusted scaled factors; and
- Calculate very low, low, medium, and high *final scaled factors* from the preliminary adjusted scaled factors such that the career-average earnings for these hypothetical workers match the selected percentages of the AWI for the year prior to entitlement (25, 45, 100 and 160 percent).

a. Calculate Preliminary Adjusted Scaled Factors from Raw Scaled Factors

The following values, based on table 2, show that there is an accelerating decline in raw factors at ages 60 and 61, followed by increases at ages 62 and 63:

Age	Raw Scaled Factor	Difference
55	0.871	---
56	0.854	-0.017
57	0.834	-0.020
58	0.812	-0.021
59	0.788	-0.024
60	0.756	-0.032
61	0.713	-0.043
62	0.847	0.134
63	0.870	0.023
64	0.859	-0.011

We do not have definitive information on the reasons for these changes after age 59. However, it seems reasonable to assume that some of the decline in the raw factors at ages 60 and 61 is due to the retirement (total or partial) of some workers before they became entitled to their OASDI retirement benefits at age 62. The increases in the raw factors at ages 62 and 63 may well occur because healthier, higher-wage workers, and workers who have maintained consistent employment at older ages, are more likely to delay entitlement to OASDI benefits until after age 62. Our methodology removes the earnings of many non-workers, low-wage workers, and less-healthy workers from the tabulated group starting at age 62 because they started to receive Social Security retirement benefits.

Due to the differences between the groups of workers represented in data for ages just before versus just after reaching age 62, we develop a smoother set of "adjusted" raw factors for ages 62 through 64. Here we assume that earnings for workers older than age 61 will stay constant in nominal dollars, thus decreasing relative to the AWI.

The preliminary adjusted scaled factors equal the raw scaled factors for ages up to 61. Table 3 calculates factors for ages 62 and older so that earnings in nominal dollars stay constant at the level for age 61. For example, we calculate the preliminary adjusted factor for age 62 by dividing the factor for age 61 by the *ultimate* assumed annual increase in average wages under the intermediate assumptions of the 2024 Trustees Report. Table 3 shows the calculation of the preliminary adjusted scaled factors for ages 62 through 64.

Though it provides an imperfect approximation for all types of workers, we adopted this approach in order to avoid having different scaled factors for workers who become entitled to OASDI benefits at different ages.

Table 3.---Scaled Factor Adjustments Made for Ages After 61

Age	61	62	63	64
Raw scaled factor	0.713	0.847	0.870	0.859
Ultimate AWI increase since age 61, based on 2024 Trustees Report, Intermediate Assumptions	1	1.0357	$(1.0357)^2$	$(1.0357)^3$
Preliminary adjusted scaled factor (age 61 raw scaled factor) / (Ultimate AWI increase)	0.713	0.689	0.665	0.642

b. Construct the Earnings Pattern and Calculate the Career-Average Earnings for a Selected Hypothetical Scaled Worker Using the Preliminary Adjusted Scaled Factors

The selected hypothetical scaled worker (referred to as the *1960-born preliminary scaled worker*) was born on January 2, 1960, has earnings from age 21 through 64, and retires at age 65. We calculate earnings for each year by multiplying the preliminary adjusted scaled factor for that age by the AWI value for the corresponding year. This worker turns age 22 in 1982, so the age 22 preliminary adjusted factor 0.282547 (rounded to 0.283 in Table 4) is multiplied by the 1982 AWI of $14,531.34 to obtain annual earnings of $4,105.79. Table 4 shows the preliminary adjusted scaled factors, AWI amounts, and corresponding hypothetical earnings for the 1960-born preliminary scaled worker.

The last line of table 4 shows career-average earnings of $56,525 (wage indexed to 2024) for the 1960-born preliminary scaled worker. This is a slightly different calculation than the AIME because (1) earnings are indexed to the year prior to entitlement rather than to two years prior to eligibility, and (2) earnings are averaged on an annual basis instead of a monthly basis. For the 1960-born preliminary scaled worker, who retires at age 65 in 2025, the indexing year used to compute career-average earnings is 2024.

Table 4.---Computation of the Earnings Record and the Career-Average Earnings for the 1960-Born Preliminary Scaled Worker Based on the Preliminary Adjusted Scaled Factors and the AWI Series

Year	Age	Preliminary adjusted scaled factors (1)	AWI for current year (2)	Estimated earnings for current year (1)*(2) (3)	Earnings wage indexed to 2024 (4)
1981	21	0.230	$13,773.10	$3,162.35	$15,795.09
1982	22	0.283	14,531.34	4,105.79	19,437.26
1983	23	0.360	15,239.24	5,489.28	24,779.69
1984	24	0.430	16,135.07	6,940.18	29,589.92
1985	25	0.485	16,822.51	8,150.83	33,331.50
1986	26	0.533	17,321.82	9,225.79	36,639.87
1987	27	0.577	18,426.51	10,634.47	39,702.39
1988	28	0.618	19,334.04	11,940.80	42,486.86
1989	29	0.653	20,099.55	13,125.51	44,923.51
1990	30	0.686	21,027.98	14,417.35	47,166.29
1991	31	0.715	21,811.60	15,589.36	49,168.24
1992	32	0.740	22,935.42	16,965.01	50,885.18
1993	33	0.762	23,132.67	17,618.86	52,395.73
1994	34	0.782	23,753.53	18,572.05	53,786.78
1995	35	0.799	24,705.66	19,749.90	54,993.62
1996	36	0.814	25,913.90	21,103.63	56,023.24
1997	37	0.828	27,426.00	22,706.34	56,954.56
1998	38	0.839	28,861.44	24,221.27	57,732.82
1999	39	0.850	30,469.84	25,907.87	58,493.20
2000	40	0.859	32,154.82	27,633.79	59,120.52
2001	41	0.868	32,921.92	28,564.97	59,688.75
2002	42	0.875	33,252.09	29,101.56	60,206.20
2003	43	0.881	34,064.95	30,024.06	60,632.51
2004	44	0.887	35,648.55	31,620.87	61,020.51
2005	45	0.892	36,952.94	32,959.25	61,358.14
2006	46	0.896	38,651.41	34,632.75	61,640.41
2007	47	0.898	40,405.48	36,295.39	61,795.25
2008	48	0.899	41,334.97	37,173.78	61,867.56
2009	49	0.899	40,711.61	36,601.73	61,848.22
2010	50	0.899	41,673.83	37,467.77	61,849.80
2011	51	0.896	42,979.61	38,528.38	61,668.32
2012	52	0.892	44,321.67	39,543.53	61,376.65
2013	53	0.887	44,888.16	39,818.09	61,022.85
2014	54	0.880	46,481.52	40,909.97	60,547.01
2015	55	0.871	48,098.63	41,879.67	59,898.29
2016	56	0.854	48,642.15	41,519.87	58,720.14
2017	57	0.834	50,321.89	41,948.28	57,345.73
2018	58	0.812	52,145.80	42,352.87	55,873.69
2019	59	0.788	54,099.99	42,634.74	54,213.86
2020	60	0.756	55,628.60	42,042.04	51,991.16
2021	61	0.713	60,575.07	43,200.56	49,061.33
2022	62	0.689	63,795.13	43,928.77	47,370.22
2023	63	0.665	66,251.14	44,047.46	45,737.39
2024	64	0.642	68,792.94	44,160.85	44,160.85
Career-Average Earnings……					$56,525.00

Note: We base career-average earnings on the highest 35 years of indexed earnings (column 4). Years 1981 through 1988 and 2024 are excluded because they are not among the highest 35 years of indexed earnings.

c. Calculate Very Low, Low, Medium, and High Final Scaled Factors from the Preliminary Adjusted Scaled Factors such that the Career-Average Earnings for These Selected Hypothetical Workers Match the Selected Percentages of the AWI in the Year Prior to Entitlement

The selected career-average earnings level for the medium scaled worker is the AWI in the year prior to entitlement. Similarly, the selected career-average earnings levels for the very low, low, and high scaled workers are 25 percent, 45 percent and 160 percent of the AWI in the year prior to entitlement, respectively. As noted earlier, the career-average earnings for the 1960-born preliminary scaled worker equals $56,525, wage indexed to 2024 (see table 4). By comparison, the projected AWI for 2024 is $68,792.94.[8] Corresponding career-average earnings levels for a very low, low, and high earner are $17,198, $30,957, and $110,069, respectively. Table 5 summarizes this information, and provides the ratio of the selected career-average earnings levels to the career-average earnings for the 1960-born preliminary scaled worker.

A primary reason for choosing the year prior to entitlement as the indexing year in computing the career-average earnings is to provide a reasonable denominator for replacement rate calculations.[9]

[8] The projected AWI value for 2024 appears in the 2024 Trustees Report. See http://www.ssa.gov/OACT/TR/2024/lr6g6.html.

[9] This choice of denominator maintains consistency with replacement rates computed prior to 2001 using hypothetical steady workers. More information about replacement rates appears in recurring Actuarial Note Number 2024.9 at http://www.ssa.gov/OACT/NOTES/ran9/an2024-9.pdf.

Table 5.---Table of Key Ratios Used to Finalize Scaled Worker Calculations

Case	Selected career-average earnings levels for hypothetical scaled workers (1)	Career-average earnings of the 1960-born preliminary selected scaled worker (2)	Ratio (1) / (2) (3)
Very low earner ……..	$17,198	$56,525	0.304
Low earner ……..	30,957	56,525	0.548
Medium earner ……	68,793	56,525	1.217
High earner …….	110,069	56,525	1.947

The last step is to apply the ratios from table 5 to the preliminary adjusted scaled factors. This step requires four separate calculations, one each for the very low, low, medium, and high scaled worker cases. For example, we determine the scaled factors for the hypothetical medium scaled worker by multiplying:

- The preliminary adjusted scaled factors for ages 21 through 64, by
- The ratio of 1.217 shown in tables 5 and 6.

Table 6 shows the calculation of the final scaled factors, combining the preliminary adjusted scaled factors with the adjustment factors.

Table 6.---Calculation of Final Scaled Factors

Adjustment Factors…….		Final Scaled Factors by Earnings Level			
		Very low	Low	Medium	High
Age	Preliminary adjusted scaled factors	0.304	0.548	1.217	1.947
21	0.230	0.070	0.126	0.279	0.447
22	0.283	0.086	0.155	0.344	0.550
23	0.360	0.110	0.197	0.438	0.701
24	0.430	0.131	0.236	0.523	0.838
25	0.485	0.147	0.265	0.590	0.943
26	0.533	0.162	0.292	0.648	1.037
27	0.577	0.176	0.316	0.702	1.124
28	0.618	0.188	0.338	0.752	1.203
29	0.653	0.199	0.358	0.795	1.272
30	0.686	0.209	0.375	0.834	1.335
31	0.715	0.217	0.391	0.870	1.392
32	0.740	0.225	0.405	0.900	1.440
33	0.762	0.232	0.417	0.927	1.483
34	0.782	0.238	0.428	0.952	1.522
35	0.799	0.243	0.438	0.973	1.557
36	0.814	0.248	0.446	0.991	1.586
37	0.828	0.252	0.453	1.008	1.612
38	0.839	0.255	0.460	1.021	1.634
39	0.850	0.259	0.466	1.035	1.656
40	0.859	0.261	0.471	1.046	1.673
41	0.868	0.264	0.475	1.056	1.690
42	0.875	0.266	0.479	1.065	1.704
43	0.881	0.268	0.483	1.073	1.716
44	0.887	0.270	0.486	1.080	1.727
45	0.892	0.271	0.488	1.086	1.737
46	0.896	0.273	0.491	1.090	1.745
47	0.898	0.273	0.492	1.093	1.749
48	0.899	0.274	0.493	1.095	1.751
49	0.899	0.274	0.492	1.094	1.751

Table 6.---Calculation of Final Scaled Factors (Cont.)

Adjustment Factors……..		Final Scaled Factors by Earnings Level			
		Very low	Low	Medium	High
Age	Preliminary adjusted scaled factors	0.304	0.548	1.217	1.947
50	0.899	0.274	0.492	1.094	1.751
51	0.896	0.273	0.491	1.091	1.746
52	0.892	0.271	0.489	1.086	1.737
53	0.887	0.270	0.486	1.080	1.727
54	0.880	0.268	0.482	1.071	1.714
55	0.871	0.265	0.477	1.060	1.695
56	0.854	0.260	0.467	1.039	1.662
57	0.834	0.254	0.457	1.015	1.623
58	0.812	0.247	0.445	0.988	1.582
59	0.788	0.240	0.432	0.959	1.535
60	0.756	0.230	0.414	0.920	1.472
61	0.713	0.217	0.391	0.868	1.389
62	0.689	0.210	0.377	0.838	1.341
63	0.665	0.202	0.364	0.809	1.295
64	0.642	0.195	0.352	0.781	1.250

4. Developing Hypothetical Worker Earnings from Factors

Given a year of birth, and an earnings level for scaled workers, classified as either very low, low, medium, or high, one can obtain annual earnings by multiplying the relevant set of scaled factors by the AWIs in the corresponding years. For example, consider a low earnings worker born in 1970. To determine earnings for this worker at age 22, multiply the scaled factor for the low scaled worker at age 22 by the AWI in 1992, the year in which the worker turns 22. Because the hypothetical workers are born in January, a year of age corresponds to a calendar year. Therefore, a worker born on January 2, 1970 would be age 22 throughout 1992. In this way, one can develop a series of very low, low, medium, and high scaled earnings for any age and hypothetical year of birth. Table 7 carries out the calculation of hypothetical scaled worker earnings for high earnings workers for the selected years of birth 1949, 1973, and 1997.

Table 7.---Example: Developing Earnings for the Hypothetical High Earners Born in 1949, 1973, and 1997

Year of birth…….		1949		1973		1997	
Age	Final scaled factors for high earner (1)	AWI (2)	Age-scaled earnings (1)*(2) (3)	AWI (4)	Age-scaled earnings (1)*(4) (5)	AWI (6)	Age-scaled earnings (1)*(6) (7)
21	0.447	$6,186.24	$2,765.84	$23,753.53	$10,620.11	$52,145.80	$23,314.18
22	0.550	6,497.08	3,574.64	24,705.66	13,592.85	54,099.99	29,765.36
23	0.701	7,133.80	5,003.76	25,913.90	18,176.41	55,628.60	39,018.77
24	0.838	7,580.16	6,348.94	27,426.00	22,971.30	60,575.07	50,736.08
25	0.943	8,030.76	7,576.89	28,861.44	27,230.28	63,795.13	60,189.62
26	1.037	8,630.92	8,951.39	30,469.84	31,601.20	66,251.14	68,711.08
27	1.124	9,226.48	10,368.89	32,154.82	36,136.18	68,792.94	77,310.78
28	1.203	9,779.44	11,761.10	32,921.92	39,593.08	71,244.83	85,681.57
29	1.272	10,556.03	13,423.13	33,252.09	42,283.61	74,091.92	94,215.84
30	1.335	11,479.46	15,326.14	34,064.95	45,479.84	77,253.92	103,141.09
31	1.392	12,513.46	17,415.72	35,648.55	49,614.19	80,803.65	112,459.22
32	1.440	13,773.10	19,838.21	36,952.94	53,225.49	84,369.71	121,522.65
33	1.483	14,531.34	21,551.67	38,651.41	57,324.55	88,032.62	130,562.64
34	1.522	15,239.24	23,201.62	40,405.48	61,517.03	91,881.05	139,888.17
35	1.557	16,135.07	25,116.70	41,334.97	64,344.20	95,915.51	149,307.15
36	1.586	16,822.51	26,677.09	40,711.61	64,560.37	99,767.94	158,211.74
37	1.612	17,321.82	27,925.54	41,673.83	67,184.86	103,433.45	166,751.21
38	1.634	18,426.51	30,112.40	42,979.61	70,236.79	107,217.77	175,214.07
39	1.656	19,334.04	32,011.60	44,321.67	73,383.91	111,141.92	184,018.98
40	1.673	20,099.55	33,635.97	44,888.16	75,118.94	115,218.14	192,813.96
41	1.690	21,027.98	35,527.89	46,481.52	78,533.00	119,447.30	201,812.56
42	1.704	21,811.60	37,171.34	48,098.63	81,969.71	123,839.18	211,046.78
43	1.716	22,935.42	39,363.32	48,642.15	83,482.94	128,357.33	220,295.52
44	1.727	23,132.67	39,955.91	50,321.89	86,918.49	133,002.05	229,727.80
45	1.737	23,753.53	41,255.30	52,145.80	90,567.20	137,796.46	239,325.89
46	1.745	24,705.66	43,106.36	54,099.99	94,393.49	142,735.34	249,044.17
47	1.749	25,913.90	45,328.08	55,628.60	97,304.44	147,808.61	258,543.88
48	1.751	27,426.00	48,029.14	60,575.07	106,080.68	153,036.52	268,001.64
49	1.751	28,861.44	50,527.13	63,795.13	111,684.83	158,422.02	277,346.18
50	1.751	30,469.84	53,344.29	66,251.14	115,987.48	163,999.30	287,117.56
51	1.746	32,154.82	56,129.05	68,792.94	120,084.09	169,766.54	296,342.34
52	1.737	32,921.92	57,196.27	71,244.83	123,775.85	175,741.32	305,320.85
53	1.727	33,252.09	57,436.88	74,091.92	127,980.18	181,921.07	314,235.23
54	1.714	34,064.95	58,382.12	77,253.92	132,401.41	188,331.33	322,771.11
55	1.695	35,648.55	60,441.56	80,803.65	137,001.34	194,980.97	330,587.21
56	1.662	36,952.94	61,420.80	84,369.71	140,233.91	201,871.85	335,538.42
57	1.623	38,651.41	62,740.19	88,032.62	142,897.32	209,009.63	339,271.02
58	1.582	40,405.48	63,903.86	91,881.05	145,315.77	216,398.79	342,248.56
59	1.535	41,334.97	63,431.85	95,915.51	147,190.09	224,055.70	343,831.55
60	1.472	40,711.61	59,913.84	99,767.94	146,824.97	232,002.13	341,429.37
61	1.389	41,673.83	57,873.83	103,433.45	143,641.45	240,252.99	333,647.28
62	1.341	42,979.61	57,629.82	107,217.77	143,764.47	248,816.92	333,629.71
63	1.295	44,321.67	57,380.85	111,141.92	143,889.38	257,706.09	333,638.00
64	1.250	44,888.16	56,111.08	115,218.14	144,024.94	266,928.11	333,665.39