The Social Security Windfall Elimination Provision: Issues and Replacement Alternatives

by Glenn R. Springstead*

Congress established the Windfall Elimination Provision (WEP) in 1983 to improve the fairness of Social Security by reducing benefits for individuals who would otherwise receive a full benefit based on earnings in Social Security–covered employment as well as pension income from noncovered employment. Since then, critics have asserted that the WEP overcorrects the would-be windfall for affected beneficiaries and is difficult to administer effectively; in response, some members of Congress have called for modifying or repealing the WEP. This article considers two WEP replacement options that would modify the benefit calculation methodology. It compares the current WEP with the two options and discusses some of the possible effects of changing the current law.

Introduction

The Social Security Administration (SSA) pays retirement and disability benefits to insured workers and, in many instances, to workers' spouses or survivors. Two Social Security provisions reduce or eliminate the benefits of certain individuals who receive pension income from employment not covered by Social Security.[1] The Windfall Elimination Provision (WEP) applies to retired workers with fewer than 30 years of Social Security–covered employment and the Government Pension Offset (GPO) applies to benefits received by spouses and widow(er)s of covered workers.

Social Security retirement and disability benefits replace a share of the beneficiary's prior earnings in covered employment and are weighted to favor workers with lower lifetime earnings. The purpose of the WEP is to remove the advantage of weighting for workers whose earnings from noncovered employment would be excluded from the benefit calculation, which could therefore mask the level of their total lifetime earnings. The particulars of the WEP formula are described later.

The GPO has a similar objective related to spousal benefits. Unlike the progressive structure of primary (worker) benefits, however, Social Security spousal benefits are designed for individuals whose lack (or low level) of covered earnings indicate a financial dependence on the insured worker. The GPO reduces or eliminates benefits to spouses who have worked in noncovered employment to an extent that they are not financially dependent on the insured worker's benefits.

Approximately two-thirds of WEP and GPO cases involve former state or local government employees, who are required to report their noncovered pension income to SSA. Agency enforcement of the provisions is difficult if beneficiary reporting is inconsistent, which can result in benefit overpayments. Additionally, affected populations misunderstand the WEP and GPO or believe them to be unfair, in principle or in application. Further, policy experts have noted aspects

Selected Abbreviations

AIME	average indexed monthly earnings
AWI	average wage index
CER	covered-earnings ratio
GPO	Government Pension Offset
OCACT	Office of the Chief Actuary
PIA	primary insurance amount

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Selected Abbreviations—*Continued*

QC	quarter of coverage
REP	relative earning position
SSA	Social Security Administration
WEP	Windfall Elimination Provision
YOC	year of coverage

of the WEP that fall disproportionately on workers with lower lifetime earnings. To address these concerns, policymakers have proposed several possible remedies, such as mandating Social Security coverage for all newly hired state and local workers; providing the Internal Revenue Service or SSA with greater authority to obtain public pension data from employers or plan administrators; modifying the WEP or GPO formulas; or simply repealing the provisions.

This article considers modification of the WEP formula. Specifically, it compares and contrasts two alternatives to the existing WEP formula and suggests how each could affect workers with different earnings histories. One modification adapts the formula SSA uses to calculate benefits for workers who have accrued earnings in both the United States and a foreign country with which a bilateral totalization agreement is in force. Under a totalization agreement, the United States and its cosignatory allow periods of work in the host country to count toward establishing eligibility and calculating the amount of social security benefits in the worker's home country. The second modification adopts a formula contained in legislation proposed in 2016 to adjust the Social Security benefit by accounting for the worker's noncovered earnings. Because historical data on noncovered earnings for a sufficient number of newly eligible beneficiaries have recently become available to SSA, such an adjustment is now possible.

The article excludes the GPO to focus on the WEP. It discusses program rules and presents estimated benefit levels for stylized hypothetical retired workers. It does not consider the effects of the two WEP modifications on disabled workers or on auxiliary beneficiaries of retired and disabled workers. Under current law, the WEP reduces the auxiliary benefits paid from the retired or disabled worker's record during the worker's lifetime.[2] It does not reduce the amount paid to the survivors of such workers.

Background

This section is divided into three subsections. The first subsection describes the computation of Social Security standard retired-worker benefits under current law, including the calculation of average indexed monthly earnings (AIME) and the primary insurance amount (PIA). The second subsection outlines the key features of the WEP, explains in more detail the policy's motivation, and reviews criticisms of the provision. The third subsection summarizes totalization agreements and the SSA database of noncovered earnings, which provide the frameworks for the two WEP replacement options analyzed here.

Social Security's Standard Benefit

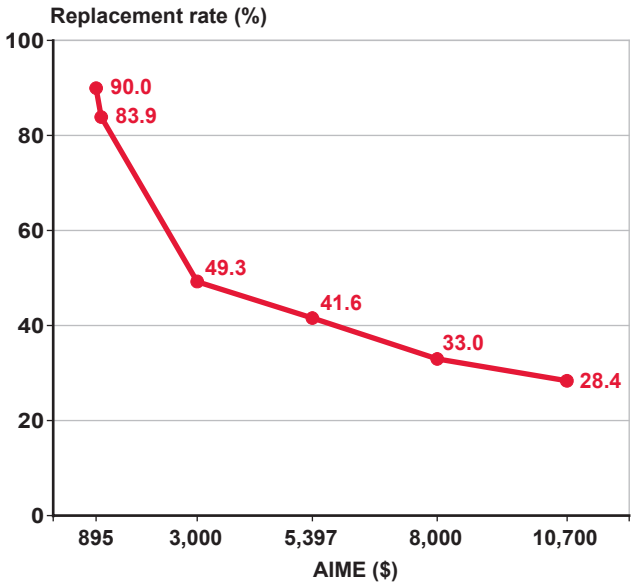
Social Security benefits replace a portion of an insured worker's average wages in covered employment, with those wages capped at a taxable maximum annual amount.[3] The benefit-to-earnings ratio, or replacement rate, is designed to be greater for lower lifetime earners than for higher lifetime earners.

To begin the benefit calculation, SSA converts a worker's lifetime earnings in covered employment to AIME, which are indexed to nationwide wage growth. SSA indexes the worker's earnings for each year worked until age 60.[4] Wage indexing keeps retirement benefits comparable to current average earnings levels. Next, SSA sums the indexed earnings in the 35 highest earning years.[5] Finally, SSA divides this sum by the number of months in the person's computation years to obtain the AIME. The number of computation years for retired workers is 35, so the number of months in the AIME denominator is 420.[6] To illustrate, a retired worker who earned $50,000 in wage-indexed dollars each year for 35 years would have AIME of $4,166.67, or 35 × $50,000 ÷ 420.

Next, SSA uses the PIA formula to convert AIME to a monthly benefit amount.[7] For workers who first became eligible for retirement or disability benefits in 2018, the PIA formula was 90 percent of the first $895 in AIME, plus 32 percent of the next $4,502 of AIME, plus 15 percent of AIME above $5,397. The key dollar amounts—$895 and $5,397—are the 2018 PIA *bend points.* Bend point amounts are indexed annually to the change in average wages. By contrast, the 90 percent, 32 percent, and 15 percent "bend point factors" are fixed by law; those percentages apply to every cohort of newly eligible beneficiaries.

By decreasing as AIME levels increase, the bend-point factors provide higher benefits relative to preretirement earnings for lower lifetime earners than for higher lifetime earners. Chart 1 shows that retirees with AIME of $895 in 2018 would have a benefit-to-earnings replacement rate of 90 percent. A worker with AIME of $3,000 would receive a benefit equal to 49 percent of preretirement earnings. The replacement rate for a worker with AIME at the second bend point, $5,397, would be lower still (42 percent), and so on.

Chart 1.
PIA-to-AIME replacement rates for selected AIME levels in 2018 (in percent)



SOURCE: Author's calculations using the Social Security PIA formula with 2018 bend points.

The WEP

Although the PIA formula under current law provides a higher replacement rate for low earners, it does not distinguish between workers whose lifetime countable earnings are low because they had periods of little or no earnings and those who had periods of noncovered employment. Table 1 presents three illustrative examples.

Workers A and B have the same lifetime covered earnings amounts and thus the same PIA, but their total lifetime earnings differ. Worker C differs from Worker A only in that all of her lifetime earnings were covered. Worker A's benefit provides a 54 percent replacement rate, but if all of his earnings had been in covered employment, his replacement rate would, like Worker C's, be 44 percent. Worker C's PIA is higher, but her replacement rate is lower.

The 10 percentage point advantage in replacement rate for the noncovered worker represents what policymakers call a "windfall" from the standard PIA formula. In 1983, Congress acted to negate the windfall by creating the WEP. The WEP adjusts the PIA based on the number of work years covered by Social Security and the amount of the beneficiary's pension income from noncovered employment.

For insured workers who also receive a monthly pension benefit from noncovered employment, SSA first reduces the PIA by scaling the first PIA-formula bend-point factor down from 90 percent. The amount by which SSA reduces the bend-point factor depends on the beneficiary's years of covered earnings (shortened to "years of coverage" or YOCs).[8] For workers

Table 1.
PIA-to-AIME replacement rates for three hypothetical workers born in 1956

Characteristic	Worker		
	A	B	C
Years worked in—			
Covered employment	20	20	35
Noncovered employment	15	0	0
Indexed earnings ($)			
Annual average	50,000	50,000	50,000
Lifetime			
In covered employment	1,000,000	1,000,000	1,750,000
Total	1,750,000	1,000,000	1,750,000
AIME ($)	2,381	2,381	4,167
PIA ($)	1,281	1,281	1,852
PIA-to-AIME replacement rate (%)	54	54	44

SOURCE: Author's calculations using indexing and bend point factors for newly eligible workers in 2018.

with 20 or fewer YOCs, the first bend-point factor under the WEP is 40 percent (Table 2). The factor increases by 5 percentage points for each additional YOC, reaching 90 percent for workers with 30 or more YOCs. Thus, workers who had substantial covered earnings in 30 years (that is, in at least 75 percent of the 40 possible years of coverage) from ages 22 through 61 are exempt from the WEP.

The difference between the PIAs calculated with the standard and the WEP formulas is compared to one-half of the worker's monthly pension from noncovered employment and the lesser of the two values is deducted from the standard PIA. This step caps the amount that the WEP can reduce the standard PIA and is known as the WEP "guarantee." Table 3 shows the standard PIA formula results for two hypothetical workers as well as the step-by-step effects of applying the WEP formula to the affected worker.

In this example, Worker A's AIME calculation accounts for 10 years of covered work, as follows: 10 years × $50,000 = $500,000 ÷ 420 months = $1,190. The standard PIA would be 90 percent of $895, plus 32 percent of $295 (that is, $1,190 minus $895); thus, $805.50 + $94.40 = $899.90, which rounds to $900. The replacement rate would be $900 ÷ $1,190, or 76 percent. However, because Worker A has fewer than 20 YOCs, the WEP PIA calculation incorporates a 40 percent bend-point factor for the first $895 of AIME, plus 32 percent of $295 (as in the standard PIA); thus, $358.00 + $94.40 = $452.40, rounded to $452. The WEP formula reduction (standard PIA minus WEP PIA) is thus $900 minus $452, or $448.

I estimate Worker A's monthly pension amount from noncovered employment by assuming a 2 percent contribution-rate multiplier over 20 years with $50,000 in noncovered earnings (20 × $50,000 × .02 = $20,000) and dividing by 12 to generate a monthly amount of $1,667. Because the WEP guarantee prohibits reductions exceeding one-half of the monthly pension payment from noncovered employment, I divide this amount by two; the result rounds to $834. Because this amount exceeds the $448 reduction from the WEP formula, and the WEP guarantee reduces the affected worker's PIA by the smaller of the two possible reduction amounts, Worker A's WEP PIA is $452. The WEP thus reduces the replacement rate from 76 percent to 38 percent for Worker A.

For Worker B, all 30 work years are in covered employment, resulting in an AIME of $3,571 (30 × $50,000 ÷ 420). The PIA (after rounding) equals

Table 2.
PIA formula under the WEP: First bend-point factors, by YOCs

YOCs	First bend-point factor (%)
30 or more	90
29	85
28	80
27	75
26	70
25	65
24	60
23	55
22	50
21	45
20 or fewer	40

SOURCE: SSA.

Table 3.
PIA levels and PIA-to-AIME replacement rates under standard and WEP formulas: Two hypothetical workers

Characteristic	Worker A	Worker B
Years worked in—		
Covered employment	10	30
Noncovered employment	20	0
Indexed earnings ($)		
Annual average	50,000	50,000
Lifetime		
In covered employment	500,000	1,500,000
Total	1,500,000	1,500,000
Standard PIA formula		
AIME ($)	1,190	3,571
PIA ($)	900	1,662
Replacement rate (%)	76	47
WEP formula		
PIA with 40% factor [a] ($)	452	. . .
Resulting PIA reduction ($)	448	. . .
Alternative PIA reduction [b] ($)	834	. . .
WEP PIA [c] ($)	452	. . .
Replacement rate (%)	38	. . .

SOURCE: Author's calculations using indexing and bend point factors for newly eligible workers in 2018.

NOTE: . . . = not applicable.

a. Forty percent factor applies to first PIA bend point for workers with 20 or fewer YOCs (see Table 2).

b. One-half the monthly pension payment from noncovered employment.

c. Equals the standard PIA minus the lesser of the two potential reduction amounts.

$1,662 (90 percent of $895, plus 32 percent of [$3,571 minus $895]), or $805.50 + $856.32, resulting in a PIA-to-AIME replacement rate of 47 percent for the fully covered worker. With 30 YOCs, Worker B is not subject to the WEP.

Table 3 illustrates that the absence of the WEP would provide Worker A with a replacement-rate windfall of 76 percent, in contrast with Worker B's 47 percent replacement rate for 30 YOCs. However, Table 3 also indicates that in this case, the WEP overcorrects for Worker A's noncovered earnings by producing a replacement rate of 38 percent instead of 47 percent. With lifetime earnings, years worked, and all other factors equal, the hypothetical workers would ideally receive identical covered-earnings replacement rates from the respective PIA formulas.

Although Congress created the WEP to remove an unintended advantage for beneficiaries with significant periods of noncovered employment, affected beneficiaries and their advocates maintain that the reductions unfairly deprive workers of benefits that they have earned.[9] Some policy experts have highlighted the provision's adverse effects on low earners in particular. For example, Brown and Weisbenner (2012) identify two regressive aspects of the WEP. First, its reductions apply only to the first (lowest) portion of AIME, meaning that as a percentage of AIME, the WEP reduction decreases as average lifetime earnings increase. Second, low earners are less likely to meet the annual YOC earnings thresholds that can lower or eliminate the WEP reduction.

These and other concerns have led some beneficiaries and policymakers to call for WEP reform. To that end, the next subsection introduces two potential modifications of the existing WEP formula.

Alternative WEP Formulas: The Totalization Model and the Use of Noncovered Earnings Records

The first potential WEP reformulation would be based on an existing benefit-calculation methodology. Totalization agreements establish retirement-benefit eligibility for workers with substantial work earnings in both the United States and another country. The first totalization agreement went into effect in 1978; as of July 31, 2019, the United States has entered into 30 such agreements.

Like the WEP, the totalization formula prorates a worker's benefit to account for earnings accrued under different circumstances—in this case, in two countries. To qualify for a totalized benefit, a U.S. worker must have at least 6 and fewer than 40 quarters of coverage (QCs) under U.S. Social Security.[10]

To compute a totalized benefit, SSA first calculates how the worker's U.S. earnings compare with those of other workers in the American economy. It does this by computing a yearly ratio of the worker's annual covered earnings to that year's national average wage index (AWI) amount.[11] SSA then calculates the average of these ratios across all years with covered earnings; the result is called the relative earning position (REP). SSA multiplies the REP by the average earnings for all U.S. workers in each year beginning with that in which the worker attained age 22 and ending with that in which he or she attained age 61, and indexes the result for each year to the AWI. This produces the worker's theoretical indexed earnings record. SSA then applies the current-law AIME and PIA formulas to the theoretical earnings record to find the theoretical PIA. To prorate the benefit, SSA multiplies this theoretical PIA by the ratio of QCs earned (at least 6 but not more than 39) to the maximum number of QCs possible over 35 work years (140). For a person with 10 QCs, for example, the prorated percentage of the theoretical PIA would be 10 ÷ 140, or approximately 7 percent. Appendix A provides a detailed example of how SSA determines the U.S. portion of a totalization benefit. Jackson and Cash (2018) discuss totalization agreements in detail.

A reformulated WEP calculation based on the totalization model would similarly project the worker's theoretical lifetime earnings (including years with noncovered earnings) based on his or her covered earnings record. The WEP PIA would then be calculated and prorated on that basis.

The second WEP reformulation option involves using noncovered earnings records. Public Law (P.L.) 94-202, enacted in January 1976, created a single annual wage-reporting system for Social Security and federal income tax purposes, replacing a cumbersome quarterly reporting system that required employers to submit different forms to SSA and the Internal Revenue Service (IRS). Beginning in 1978, employers could submit their wage reports to both agencies on IRS Form W-2 (SSA 1976; Committee on Finance, United States Senate 1977). This change not only simplified the wage-reporting process; the W-2 data that were now reported to SSA also included information previously submitted only to the IRS, such as earnings above the taxable maximum and any noncovered earnings (Olsen and

Hudson 2009). Although the wage-reporting requirements in P.L. 94-202 did not originally apply to state governments, SSA required states to submit annual rather than quarterly wage reports beginning in 1982 (Waldron 2006).

The law requiring employers to report noncovered earnings to SSA was probably not enacted to support WEP enforcement or reform, but the existence of such records now raises the possibility of their use for the latter purpose. SSA's records would, in theory, now cover all earnings after age 20 for newly eligible retired-worker beneficiaries in 2019. In practice, however, states did not consistently report their employees' total wages annually until 1982, and SSA does not consider the noncovered-earnings data from 1978 to 1981 reliable. Further, the reporting of such earnings remained incomplete into the mid-1990s. Finally, because SSA has not used the noncovered-earnings records for benefit computations, those data have not been subject to rigorous quality tests.

Because SSA's historical database of noncovered earnings records continues to increase in depth and completeness, policymakers may now assess a greater array of potential WEP reforms (or outright replacements). For example, the proposed Social Security Reform Act of 2016 (H.R. 6489) included a provision that would have replaced the current WEP formula with one that accounted for noncovered as well as covered earnings.[12] Their replacement formula included three elements: the current-law AIME, which is based on covered earnings only; a second earnings measure called "total AIME," which would account for both covered and noncovered earnings; and the "total PIA," which would be calculated based on total AIME rather than covered AIME. The replacement formula would use the three elements as follows:

WEP PIA =
total PIA × current-law (covered) AIME ÷ total AIME.

Unlike the totalization-model formula, which would project a worker's pattern of covered earnings over a working lifetime, this approach accounts for the worker's accrual of noncovered earnings. Because it measures the ratio of covered earnings to total covered and noncovered earnings, I refer to this as the covered-earnings ratio (CER) option.

The CER option would free beneficiaries from reporting their noncovered pension income, as required under the current WEP. Although that change would simplify the WEP, it would also remove the WEP guarantee and its protection of beneficiaries with relatively small noncovered pensions. However, including noncovered earnings in the formula would also eliminate the YOC-based thresholds from the benefit calculation.

Table 4 illustrates how the CER formula would affect the same two hypothetical earners from Table 3: Worker A, with 10 years of covered earnings and 20 years of noncovered earnings; and Worker B, with 30 years of covered earnings. Both earn $50,000 in wage-indexed dollars each year for 30 years, so they have equal lifetime earnings. Worker A has current-law AIME of $1,190 (10 × $50,000 ÷ 420) and total AIME, combining covered and noncovered earnings, of $3,571 ([10 × $50,000 + 20 × $50,000] ÷ 420). Based on total AIME, Worker A's total PIA is $1,662 (90 percent of $895, plus 32 percent of [$3,571 minus $895], or $805.50 + $856.32, which rounds to $1,662).

Using the CER formula, I multiply Worker A's total PIA ($1,662) by the ratio of current-law AIME ($1,190) to total AIME ($3,571), which is 0.3332; the result rounds to $554.

Table 4.
PIA levels and PIA-to-AIME replacement rates under standard and CER formulas: Two hypothetical workers

Characteristic	Worker A	Worker B
Years worked in—		
Covered employment	10	30
Noncovered employment	20	0
Indexed earnings ($)		
Annual average	50,000	50,000
Lifetime		
In covered employment	500,000	1,500,000
Total	1,500,000	1,500,000
Standard PIA formula		
AIME ($)	1,190	3,571
PIA ($)	900	1,662
Replacement rate (%)	76	47
CER formula		
Total AIME ($)	3,571	3,571
Total PIA ($)	1,662	1,662
Total-PIA replacement rate (%)	47	47
WEP PIA ($) using CER model	554	1,662

SOURCE: Author's calculations using indexing and bend point factors for newly eligible workers in 2018.

For Worker B, the CER formula multiplies total PIA ($1,662) by the ratio of current-law AIME ($3,571) to total AIME (also $3,571), which converts to $1,662 × 1, or simply $1,662. For both workers, the CER PIA replaces 47 percent of covered earnings.

Methods and Analytical Approach

This analysis compares the current-law standard and WEP PIAs with the totalization-model and CER WEP reformulations. The hypothetical workers described above differed only in their covered and noncovered work years. However, to better assess the distributional qualities of the four PIAs, this section introduces more complexity by increasing the number of worker types and varying the levels of annual and lifetime wages. It also increases the sensitivity of the analysis by considering the timing of covered and noncovered wages—that is, whether the covered earnings occurred in one period at the start, middle, or end of the working career; or occurred at two different times, at both the start and the end of the working career. Wage levels are categorized at three broad levels: low, medium, and high.

Stylized Workers

All stylized workers in this analysis are hypothetical retired-worker beneficiaries who were born in 1953. These workers first became eligible for retired-worker benefits in 2015, when they reached age 62. As such, their PIA calculations use the 2015 bend points of $826 and $4,980. The stylized workers reached age 65 in 2018, the year of analysis.

Scaled Earnings by Age. I use scaled factors developed by SSA's Office of the Chief Actuary (OCACT) to estimate lifetime earnings. These factors replicate actual earnings histories from SSA's Continuous Work History Sample, an administrative data file. OCACT's Clingman and Burkhalter (2018) updated the factors for the intermediate assumptions of the *2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds.* The OCACT authors explain the construction of the factors for four levels of lifetime earnings—very low, low, medium, and high. For each earnings level, they develop and apply a scaling factor to each earning age from 21 through 64. The scaling factor is a multiple of the AWI in that year. For example, for a medium-earning worker born in 1953, the scaling factor is 0.304 in 1974 for age 21, or 30.4 percent of the AWI. That is, the medium earner's wages at age 21 are 30.4 percent of the AWI in 1974. As the AWI in 1974 was $8,030.76, the medium earner's scaled annual wage was $2,441.35. The scaling factor for 20 years later, when this medium earner was 41 years old, is 1.062. So, his or her age-41 earnings are estimated to be 106.2 percent of the AWI in 1994 ($23,753.53), or $25,226.25. These earning levels are in nominal dollars and do not reflect the wage indexing used in calculating the worker's AIME. Regardless of earnings level, the general pattern of the scaling factors reflects earnings increases from lower levels in the first work years to a peak around age 50 and a slight decline thereafter. Appendix B presents a tabular list of the scaling factors.

Although OCACT created four earnings categories, this article omits the very-low category. Clingman and Burkhalter assumed an annual earnings amount for a stylized worker in each earnings level: 45 percent of the AWI for a low earner, 100 percent of the AWI for a medium earner, and 160 percent of the AWI for a high earner.[13]

Because the OCACT scaling factors assume a working career of 44 years, this analysis compares the two WEP replacement options for stylized workers with 44 years of earnings. I split the stylized workers' 44-year working careers into one of two combinations of covered and noncovered work years: either 10 covered and 34 noncovered years or 24 covered and 20 noncovered years.[14]

Timing of Covered and Noncovered Work. Because the annual-earnings scaling factors are weighted based on when in the life cycle they occur, I assume that the timing of covered and noncovered earnings will affect lifetime earnings and benefit estimates. For example, because the scaling factors increase as a percentage of the AWI in the later years of earnings, I expect covered earnings accrued in the middle or late phases of the worker's career to be higher than those accrued in the early phase. To account for this effect, I distribute the stylized workers into four career-phase patterns, or "profiles," for covered earnings.

Workers in the early-career profile accrued all lifetime covered earnings at the start of their careers. For the 10-year covered worker in this profile, all covered earnings occurred at ages 21–30 and all noncovered earnings occurred thereafter. For the 24-year covered worker, all covered earnings occurred at ages 21–44.

Workers in the mid-career profile accrued all lifetime covered earnings in the middle of the career, and noncovered work years occurred at the start and end of their careers. For the 10-year covered worker in this profile, all covered earnings occurred at ages 38–47,

and 17-year periods of noncovered work occurred at ages 21–37 and 48–64. For the 24-year covered worker, all covered earnings occurred at ages 31–54, and 10-year stretches of noncovered work occurred at ages 21–30 and 55–64.

Late-career workers accrued all lifetime covered earnings at the end of their careers. For the 10-year covered worker in this profile, all covered earnings occurred at ages 55–64 and all prior earnings were in noncovered employment. For the 24-year covered worker, all covered earnings occurred at ages 41–64.

Combined early/late career or "sandwich" workers accrued covered earnings in two periods of equal length at the start and the end of their careers. For the 10-year covered worker in this profile, 5 years of covered work occurred at ages 21–25 and again at ages 60–64. For the 24-year covered worker, 12 years of covered work occurred at ages 21–32 and again at ages 53–64.

PIA Estimates. Using the stylized-worker examples described above, this article compares current-law standard and WEP PIAs with the WEP PIAs that would result from the use of the two proposed reformulations: the totalization model and the CER. For all PIA estimates, I index annual earnings to age 60 and keep earnings at ages 61 through 64 in nominal terms (as under current law).[15] Likewise, all estimates use only the 35 highest earning years to calculate AIME.

Estimation of the current-law standard PIA follows the process described earlier. For the WEP PIA, I compare the worker's scaled nominal earnings to the YOC threshold in that year. In some cases, this means that not every year of covered earnings qualifies as a YOC for WEP purposes. I also assign an assumed value for the noncovered monthly pension amount by multiplying the average of the highest 5 annual noncovered earnings amounts by the number of noncovered work years and a 2 percent multiplier, then dividing the result by 12. To calculate the WEP PIA guarantee, I divide this amount by two. Using a 5-year average and a 2 percent multiplier is consistent with the pension computations commonly used by retirement systems for noncovered workers.[16]

Because the totalization PIA formula specifically applies to workers with less than 40 (but more than 6) QCs of U.S. coverage, it only applies to workers who are not insured under current law. For this article, however, I apply the totalization formula to stylized workers who are fully insured for U.S. benefits. For that reason, I refer to this formula as the *totalization model* to distinguish it from the current-law totalization program and formula. In all other respects, this analysis uses the statutory calculation procedure. Appendix C details the specific steps and components of the totalization-model PIA.

The CER PIA estimates use the current-law AIME and PIA calculations and add the total-AIME calculation, which constitutes the 35 highest earning years, whether in covered or noncovered employment. Covered and noncovered work is assumed to occur in separate (nonoverlapping) years.

Results

This section first summarizes some key findings across earnings levels. More detailed discussions of the results for high, medium, and low earners follow. A table accompanies the discussion for each earnings-level group. The table shows the current-law standard and WEP PIA, totalization-model PIA, and CER PIA in monthly benefit dollars for 2018. It also shows the replacement rate—that is, the PIA as a percentage of covered AIME. The table shows these estimated values by the number and timing of years of covered employment; that is, for each covered-earnings career-timing profile within both the 10-year and 24-year covered-earnings scenarios.

Please note that the dollar amounts and percentages do not predict the overall cost to the Social Security trust funds of a particular provision or replacement option. Furthermore, the comparisons below assume that the current-law WEP applies to each stylized worker. Readers should be aware that any WEP replacement legislated by Congress might affect beneficiaries who are not affected by the current-law WEP. For example, legislation implementing a new PIA based on SSA's record of noncovered earnings may change benefits for beneficiaries who do not receive, or who have not reported to SSA, income from noncovered pensions.

General Findings

Five broad-level observations emerge from the analysis:

- First, the totalization-model and CER PIA estimates are higher than the WEP PIA for the medium and low earners regardless of worker type. Only for some high earners is the WEP PIA higher than the totalization-model and CER estimates.
- Second, the totalization-model PIA is generally higher than the CER PIA, particularly for the

workers with early-career and combined early/late-career covered earnings. Even when the totalization-model PIA is less than the CER PIA, the difference is typically not large.

- Third, the CER PIA produces a consistent replacement rate for all workers within a given earnings level. Regardless of the number or timing of a worker's covered work years, the CER PIA will be the same percentage of AIME because the CER's total AIME makes no distinction between covered and noncovered earnings.
- Fourth, and in direct contrast to the third, the current-law standard and WEP PIAs and the totalization-model PIA are rather sensitive to the number and timing of covered work years.
- Finally, some workers are not credited with WEP YOCs for all years of covered work. For example, low earners with 24 years of covered work are credited with 20 or fewer YOCs. This leaves them with the same WEP bend-point factor (40 percent) as the low-earning 10-year covered worker.

High Earners

Table 5 shows the current-law standard and WEP PIAs and the totalization-model and CER PIAs in monthly dollars and as a percentage of AIME for a high earner (that is, one who earns 160 percent of the AWI). Regardless of the number and timing of covered work years, high earners received a YOC credit for each year of covered earnings. This is most significant for workers with 24 years of covered employment, because each YOC above 20 increases the WEP bend-point factor by 5 percent. As a result, high earners in all four career-timing profiles with 24 years of covered employment have a WEP bend-point factor of 60 percent.

The alternative WEP PIAs are lower than the current-law WEP PIA for some high earners. Among workers with 10 years of covered employment, the early-career and sandwich profiles have lower PIAs from the CER than they do from the current-law WEP. Among workers with 24 years of covered employment, every career profile has a lower PIA from the CER than that from the current-law WEP, while only the mid- and late-career profiles have a PIA from the

Table 5.
Estimated PIAs and PIA-to-AIME replacement rates for high earners under current-law and alternative WEP formulas, by duration and timing of covered employment: Workers born in 1953

		Current law				Alternative WEPs			
		Standard		WEP [a]		Totalization model		CER [b]	
Covered employment timing	AIME in covered employment ($)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)
	10 years in covered employment, 34 years in noncovered employment								
Early career	1,047	814	78	401	38	475	45	388	37
Middle career	1,830	1,065	58	652	36	656	36	678	37
Late career	1,579	984	62	571	36	612	39	585	37
Early and late career (sandwich)	1,118	837	75	424	38	485	43	414	37
	24 years in covered employment, 20 years in noncovered employment								
Early career	3,461	1,587	46	1,339	39	1,433	41	1,282	37
Middle career	4,285	1,850	43	1,603	37	1,557	36	1,588	37
Late career	4,185	1,818	43	1,571	38	1,536	37	1,551	37
Early and late career (sandwich)	3,304	1,536	47	1,289	39	1,382	42	1,224	37

SOURCE: Author's calculations using OCACT's earnings-by-age scaling factors.

NOTES: High earners are assumed to earn 160 percent of the AWI.

PIAs do not reflect cost-of-living adjustments.

a. The WEP guarantee does not apply to high earners because their WEP PIA reduction is less than one-half the amount of their monthly noncovered pension income in all scenarios.

b. The CER replacement rate is calculated using total AIME and total PIA. All high earners have total AIME of $6,011 and a total PIA of $2,227. The CER PIAs vary across scenarios because of the differing levels of covered AIME.

totalization model that is lower than that from the current-law WEP.

The current-law standard PIA formula can generate relatively high replacement rates for high earners when the duration of covered employment is short. For workers with 10 years in covered employment, the current-law WEP dramatically reduces replacement rates. The CER replacement rates are the same for all high earners irrespective of the length or timing of their covered employment because their total lifetime earnings are equal.

Medium Earners

Table 6 shows the current-law standard and WEP PIAs and the totalization-model and CER PIAs in monthly dollars and as a percentage of AIME for a medium earner (that is, one who earns 100 percent of the AWI). Regardless of the number and timing of covered work years, both of the alternative WEP PIAs are higher than the current WEP PIA—a contrast with many of the high-earner scenarios.

The totalization model produced a higher PIA than the CER in three of the career-timing profiles for workers with 10 years in covered employment. Only for workers with midcareer covered earnings was the CER PIA higher. For workers with 24 years of covered employment, the totalization-model PIA was greater than the CER PIA for the early-career and sandwich profiles only.

Among workers with 10 years of covered employment, those in the early-career and sandwich profiles receive the maximum replacement rates from the current-law standard and WEP PIAs, 90 percent and 40 percent, respectively. Because their AIME are lower than the first PIA bend point, all of these workers' AIME are subject to the first (and highest) percentage factor. By contrast, workers in the mid- and late-career profiles have AIME that exceed the first bend point, resulting in replacement rates lower than the 90 percent and 40 percent maximums (as applicable).

Among workers with 24 years of covered employment, the current-law WEP replacement rate is slightly

Table 6.
Estimated PIAs and PIA-to-AIME replacement rates for medium earners under current-law and alternative WEP formulas, by duration and timing of covered employment: Workers born in 1953

		Current law				Alternative WEPs			
		Standard		WEP [a]		Totalization model		CER [b]	
Covered employment timing	AIME in covered employment ($)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)
10 years in covered employment, 34 years in noncovered employment									
Early career	654	589	90	262	40	348	53	293	45
Middle career	1,144	845	74	432	38	506	44	512	45
Late career	987	795	81	382	39	447	45	442	45
Early and late career (sandwich)	699	629	90	280	40	354	51	313	45
24 years in covered employment, 20 years in noncovered employment									
Early career	2,163	1,172	54	[c] 841	[c] 39	1,027	47	968	45
Middle career	2,678	1,336	50	1,088	41	1,187	44	1,198	45
Late career	2,616	1,316	50	1,068	41	1,165	45	1,171	45
Early and late career (sandwich)	2,065	1,140	55	[c] 810	[c] 39	987	48	924	45

SOURCE: Author's calculations using OCACT's earnings-by-age scaling factors.

NOTES: Medium earners are assumed to earn 100 percent of the AWI.

PIAs do not reflect cost-of-living adjustments.

a. The WEP guarantee does not apply to medium earners because their WEP PIA reduction is less than one-half the amount of their monthly noncovered pension income in all scenarios.

b. The CER replacement rate is calculated using total AIME and total PIA. All medium earners have total AIME of $3,757 and a total PIA of $1,681. The CER PIAs vary across scenarios because of the differing levels of covered AIME.

c. Because medium earners in this profile are credited with only 22 YOCs, their WEP PIA factors are 50 percent rather than 60 percent.

lower than 40 percent for those in the early-career and sandwich profiles and slightly higher than 40 percent for those in the mid- and late-career profiles. The rate is lower than 40 percent for workers with 24 years of covered employment in the early-career and sandwich profiles for two reasons. First, their AIME exceed the first bend point because their covered work years and lifetime earnings are greater than those of workers in other profiles or with 10 years of covered employment. Second, because the scaling factors assume lower earnings in the early phase of a worker's career, their earnings did not met the YOC threshold in 2 of their 24 years of covered employment, and their WEP bend-point factor is 50 percent (for 22 YOCs) instead of 60 percent (for 24 YOCs; see Table 2). Specifically, AIME levels are $2,163 for the early-career profile and $2,065 for the sandwich profile, well more than the first bend point of $826 for 2015. The first $826 of AIME is replaced at 50 percent, but the portion above $826 is replaced at only 32 percent; in both of these profiles, this reduces the overall replacement rate to less than 40 percent.

The replacement rate is higher than 40 percent for workers with 24 years of covered employment in the mid- and late-career profiles because the scaled covered earnings for these workers surpass the WEP YOC threshold in all 24 years, allowing the first $826 in AIME to be replaced at 60 percent. Although AIME of more than $826 are replaced at 32 percent, the aggregate replacement rate exceeds 40 percent. As with high earners, the CER replacement rate is constant across all scenarios; for all medium earners, it is 45 percent.

For medium earners with 24 years of covered employment, WEP PIAs based on 24 YOCs instead of 22 YOCs would still not match either of the alternative WEP PIAs (not shown). For low earners, the implications of having years of annual covered earnings that do not meet the YOC thresholds are even more pronounced.

Low Earners

Table 7 shows the current-law standard and WEP PIAs and the totalization-model and CER PIAs in monthly dollars and as a percentage of AIME for a low earner (that is, one who earns 45 percent of the AWI). The two alternative WEP PIAs would be higher than the current WEP PIA for all eight covered-employment scenarios. Among workers with 10 years of covered employment, the totalization-model PIA would be higher than the CER PIA for all but those with midcareer covered earnings. Among workers with 24 years of covered employment, the totalization-model PIA would be higher than the CER PIA for those in the early-career and sandwich profiles and only slightly lower for those in the mid- and late-career profiles.

Unlike the stylized high earner, who earned a YOC for each year of covered earnings, the stylized low earner meets the YOC threshold for each year of covered earnings in only one of the eight earnings-history scenarios: the worker with 10 midcareer years of covered employment. The YOC threshold does not affect the current-law WEP PIA of low earners with 10 years of covered earnings in the early-, late-, and sandwich-career profiles, as the WEP bend-point factor is no lower than 40 percent in any case.

In contrast with low earners who have 10 years of covered employment, the YOC thresholds substantially affect those with 24 years of covered employment. A worker credited with 23 YOCs instead of 24 YOCs, for example, would have a WEP PIA factor of 55 percent; one who received only 22 YOCs would have a WEP PIA factor of 50 percent, and so on. In fact, none of the 24-year low earners in Table 7 is credited with more than 20 YOCs. As a result, their WEP formulas have the same 40 percent WEP PIA factor as the 10-year covered workers, instead of the 60 percent factor that would have applied if all 24 years of covered work met the YOC earnings thresholds.

Table 8 illustrates how the YOC earnings thresholds and the WEP guarantee affect the WEP PIA for low earners. If the WEP guarantee were not in place, the difference between being credited with a YOC for all 24 years worked in covered employment and in being credited with no more than 20 YOCs because of the YOC earnings threshold would amount to $165 or $166. The WEP guarantee raises the PIA for low earners with 20 or fewer YOCs—note that those values replicate the values from Table 7. Among low earners with 24 YOCs, the WEP guarantee increases the PIA only for those in the late-career profile.

Both of the alternative WEP PIAs would be higher than the current-law WEP PIA for a low earner, even with the WEP guarantee in place and assuming the worker were credited with 24 YOCs. Only for workers with late-career covered earnings do the two current-law WEP PIAs with the WEP guarantee come within $25 of the totalization-model or CER PIAs. In particular, the totalization-model PIA is about $100 greater than the current-law WEP PIA—even with its guarantee and assuming 24 YOCs— for the early-, mid-, and sandwich-career profiles.

Table 7.

Estimated PIAs and PIA-to-AIME replacement rates for low earners under current-law and alternative WEP formulas, by duration and timing of covered employment: Workers born in 1953

Covered employment timing	AIME in covered employment ($)	Current law				Alternative WEPs			
		Standard		WEP [a]		Totalization model		CER [b]	
		PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)	PIA ($)	PIA ÷ AIME (%)
10 years in covered employment, 34 years in noncovered employment									
Early career	294	265	90	118	40	232	79	177	60
Middle career	514	463	90	206	40	303	59	310	60
Late career	444	400	90	178	40	277	62	268	60
Early and late career (sandwich)	314	283	90	126	40	235	75	190	60
24 years in covered employment, 20 years in noncovered employment									
Early career	973	790	81	[c] 472	[c] 49	643	66	587	60
Middle career	1,205	865	72	[c] 550	[c] 46	718	60	727	60
Late career	1,177	856	73	[c] 688	[c] 58	705	60	710	60
Early and late career (sandwich)	929	776	84	[c] 491	[c] 53	625	67	561	60

SOURCE: Author's calculations using OCACT's earnings-by-age scaling factors.

NOTES: Low earners are assumed to earn 45 percent of the AWI.

PIAs do not reflect cost-of-living adjustments.

a. The WEP guarantee does not apply to low earners with 10 years in covered employment because their WEP PIA reduction is less than one-half the amount of their monthly noncovered pension income. However, the WEP guarantee limits the WEP PIA reduction for all low earners with 24 years in covered employment.

b. The CER replacement rate is calculated using total AIME and total PIA. All low earners have total AIME of $1,690 and a total PIA of $1,020. The CER PIAs vary across scenarios because of the differing levels of covered AIME.

c. Because low earners in this profile are credited with only 20 YOCs, their WEP PIA factors are 40 percent rather than 60 percent.

Table 8.

Estimated PIAs for low earners with 24 years of covered employment under current-law and alternative WEP formulas, with effects of WEP guarantee and different YOC levels: Workers born in 1953 (in dollars)

Covered employment timing	Current-law WEP PIA				Alternative WEP PIAs	
	Without WEP guarantee		With WEP guarantee			
	20 or fewer YOCs	24 YOCs	20 or fewer YOCs	24 YOCs	Totalization model	CER
Early career	377	543	472	543	643	587
Middle career	452	617	550	617	718	727
Late career	443	608	688	688	705	710
Early and late career (sandwich)	363	529	491	529	625	561

SOURCE: Author's calculations using OCACT's earnings-by-age scaling factors.

NOTES: Low earners are assumed to earn 45 percent of the AWI.

PIAs do not reflect cost-of-living adjustments.

Returning to Table 7, note that the replacement rates for workers with 10 years of covered employment reveal that the timing of covered work does not affect the current-law standard and WEP PIAs or the CER PIA. By contrast, the replacement rates for the totalization-model PIA vary considerably, ranging from a high of 79 percent for the early-career profile to a low of 59 percent for the mid-career profile. This range illustrates the varying effect of the timing of covered work, in that earnings tend to be lower in a worker's early career and higher at midcareer, leading to higher and lower replacement rates, respectively. For workers with 24 years of covered employment, replacement rates vary by career profile, except those for the CER PIA which, as noted earlier, has constant replacement rates irrespective of when covered work occurred.

Discussion

Brown and Weisbenner (2012) identified two features of the current-law WEP that can adversely affect low earners. First, low earners may not meet annual YOC earnings thresholds, which can lower the first WEP bend-point factor and thus the WEP PIA. Second, because the WEP PIA reduces only the first bend-point factor, the WEP reduction as a percentage of AIME decreases as earnings increase.

This analysis has shown how workers' earnings histories can interact with the YOC earnings thresholds to determine WEP PIAs. In particular, low earners with 24 years of covered employment often do not get YOC credit for all their covered work. As a result, they have lower WEP PIAs, relative to the number of years actually worked in covered employment, than high earners. Low earners with 24 years of covered employment in all four of the career-timing profiles were credited with only 20 YOCs for 24 covered work years, and thus were subject to a bend-point factor of 40 percent instead of 60 percent. This analysis has also shown that, although the WEP guarantee can offset part of this adverse effect, the current-law WEP PIA for low earners still falls short of the PIAs that the totalization-model and CER formulas would produce. Therefore, this analysis validates some of Brown and Weisbenner's key findings.

However, the foregoing analysis did not directly address the WEP PIA reductions as percentages of AIME, either under current law or for the alternative WEP options. Table 9 shows the effect of the current-law WEP and the two alternative WEP proposals on PIAs as percentages of AIME by the number and timing of covered work years and by lifetime earnings level. The percentage of AIME by which the current-law WEP reduces PIA for workers with 10 years of covered employment increases or remains unchanged as the lifetime earnings level decreases. (Medium earners in the early- and sandwich-career profiles and all low earners are subject to the maximum 50 percent reduction that can occur under the WEP PIA.) By contrast, the PIA reduction as a percentage of AIME for the WEP alternatives is generally greater for medium earners than for high earners and less for low earners than for all others. The two exceptions are slight: The reduction for low earners was 1 percentage point higher than that for medium earners in the midcareer profile for both alternatives.

For workers with 24 years of covered employment, the PIA reduction as a percentage of AIME increases under the current-law WEP from high to low earners for all career profiles. The pattern for the totalization-model and CER WEPs for workers with 24 years of covered employment differs from that for workers with 10 years of covered employment. The 14 additional covered years render the totalization-model PIA more similar to the current-law WEP PIA for the early- and sandwich-career profiles, in that the PIA reduction as a percentage of AIME increases as the earnings level decreases. For the mid- and late-career profiles, the totalization model reduces the PIA as a percentage of AIME slightly more for high earners than for medium earners, and reduces the PIA considerably more for low earners. The pattern for the CER is similar to that of the totalization model: The reduction percentage remains mostly flat between high and medium earners, but increases sharply from medium to low earners.

Conclusion

This article summarizes Social Security's WEP, explains its computation, and explores its implications for workers with various types of covered earnings histories. In addition, it outlines two possible replacement options, one adapted from an existing formula used in calculating benefits for workers with some foreign earnings, and the other drawn from a recent congressional proposal to calculate benefits using the ratio of covered earnings to total earnings. The article illustrates the variety of potential PIA outcomes for workers with different lifetime earnings levels and covered-work patterns and discusses some reasons for the differing outcomes generated by each alternative.

Two findings stand out. First, for low and medium earners, the totalization-model and CER PIAs are

Table 9.
Effects of current-law and alternative WEP formulas on PIA expressed as a percentage of AIME in covered earnings, by lifetime earnings level and duration and timing of covered employment: Workers born in 1953

Covered employment timing	High earner	Medium earner	Low earner
10 years in covered employment, 34 years in noncovered employment			
Current-law WEP			
Early career	-40	-50	-50
Middle career	-23	-36	-50
Late career	-26	-42	-50
Early and late career (sandwich)	-37	-50	-50
Totalization model			
Early career	-32	-37	-11
Middle career	-22	-30	-31
Late career	-24	-35	-28
Early and late career (sandwich)	-32	-39	-15
CER			
Early career	-41	-45	-30
Middle career	-21	-29	-30
Late career	-25	-36	-30
Early and late career (sandwich)	-38	-45	-30
24 years in covered employment, 20 years in noncovered employment			
Current-law WEP			
Early career	-7	-15	-33
Middle career	-6	-9	-26
Late career	-6	-10	-14
Early and late career (sandwich)	-8	-16	-31
Totalization model			
Early career	-4	-7	-15
Middle career	-7	-6	-12
Late career	-7	-6	-13
Early and late career (sandwich)	-5	-7	-16
CER			
Early career	-9	-9	-21
Middle career	-6	-5	-11
Late career	-6	-6	-12
Early and late career (sandwich)	-10	-11	-23

SOURCE: Author's calculations using OCACT's earnings-by-age scaling factors.

NOTE: High earners are assumed to earn 160 percent of the AWI, medium earners are assumed to earn 100 percent of the AWI, and low earners are assumed to earn 45 percent of the AWI.

higher than the current-law WEP PIAs. (Some high earners would have lower PIAs under the alternatives.) Second, the totalization-model PIAs are higher than the CER PIAs for most of the stylized workers analyzed.

Although this analysis is restricted to stylized workers, microsimulation analysis based on survey data and administrative earnings records may further highlight the potential advantages or liabilities of these alternatives. In particular, actual monthly noncovered pension values may differ from those projected here, meaning that the current-law WEP's reduction in benefits might be lower or higher than these estimates.

Another area for further work is the GPO. Beneficiaries affected by the WEP and the GPO could be affected differently by either of the alternative formulas. Leaving the GPO in place while replacing the WEP with a more proportional calculation could lead to unintended consequences for beneficiaries who are subject to both provisions.

Appendix A: Calculating a Totalization-Agreement Benefit

To calculate a Social Security benefit under totalization, SSA first identifies the worker's years of covered earnings and determines the average annual ratio of those earnings to the national AWI. This ratio is called the REP. Table A-1 shows an illustrative REP calculation for a worker who was born in 1953 and who had covered earnings from 1975 through 1980.

For each year of covered earnings, SSA divides the worker's nominal covered earnings by the national AWI that year. In 1975, when the AWI was $8,631, the worker's nominal covered earnings were $10,000, or slightly more than the AWI (a ratio of 1.16). In 1976, the worker's nominal covered earnings remained the same, but the AWI increased to $9,226, a ratio of 1.08; and so on. SSA sums the six annual ratios and then divides that sum by six to provide the REP (1.16).

Table A-1.
REP calculation for a hypothetical worker

Year	Actual earnings (nominal $)	National AWI ($)	Ratio
1975	10,000	8,631	1.16
1976	10,000	9,226	1.08
1977	12,000	9,779	1.23
1978	13,000	10,556	1.23
1979	13,000	11,479	1.13
1980	14,000	12,513	1.12
REP (6-year average)	. . .	. . .	1.16

SOURCES: Author's calculations and https://www.ssa.gov/OACT/COLA/AWI.html.

NOTE: . . . = not applicable.

Next, SSA multiplies the average national earnings in each year from when the worker attained age 22 through the year in which she or he reached age 61 by the REP.[17] For our hypothetical worker, SSA would multiply the AWI by the REP of 1.16 for each year from 1975 through 2014 to obtain this worker's theoretical earnings record. SSA then wage-indexes each year of theoretical earnings to the year 2013 (when the worker reached age 60), as under current law. The 40-year sum of these years of projected indexed earnings is $2,084,659.

SSA next calculates the worker's theoretical AIME using the standard AIME computation procedure described in this article's Background section. The lowest 5 years of indexed earnings are dropped from the lifetime total, leaving a sum of $1,824,308. SSA then divides this sum by 420, the number of months in 35 years, which results in a theoretical AIME of $4,344.

SSA then applies the standard PIA formula to the theoretical AIME. The result is the theoretical PIA, or the benefit to which the worker would have been entitled if he or she worked a full career under U.S. Social Security at a constant level of earnings relative to all other workers. In 2015, when a worker born in 1953 reached age 62 and became eligible for a retired-worker benefit, the PIA-formula bend points were $826 and $4,980. Thus, for our hypothetical worker with a theoretical AIME of $4,344, the theoretical PIA equation is 90 percent of $826, plus 32 percent of ($4,344 minus $826); or $743 + $1,126, or $1,869.

Finally, SSA prorates the theoretical PIA based on the share of lifetime QCs that were accrued under U.S. Social Security coverage. A standard PIA calculation assumes 4 QCs in each of 35 computation years, or 140 lifetime QCs. Our hypothetical worker had 6 years of Social Security coverage, in which she or he earned 24 QCs. The ratio of covered QCs to total QCs (24 ÷ 140) is 0.17143. The theoretical PIA of $1,869 is multiplied by 0.17143, resulting in a prorated totalized PIA benefit of $320.40.[18]

Appendix B: Earnings Scaling Factors

Table B-1 shows OCACT's yearly scaling factors for low, medium, and high earners born in 1953. The scaling factors are multiplied by the AWI to obtain the nominal earnings for that year.

Table B-1.
Annual earnings scaling factors (percentage of AWI), by earnings level: Workers born in 1953

Year	Age	Low earner	Medium earner	High earner
1974	21	0.137	0.304	0.486
1975	22	0.165	0.367	0.586
1976	23	0.206	0.458	0.732
1977	24	0.244	0.542	0.868
1978	25	0.275	0.611	0.977
1979	26	0.302	0.671	1.074
1980	27	0.327	0.726	1.161
1981	28	0.349	0.775	1.240
1982	29	0.368	0.818	1.308
1983	30	0.385	0.855	1.368
1984	31	0.399	0.887	1.419
1985	32	0.412	0.915	1.464
1986	33	0.423	0.940	1.504
1987	34	0.433	0.962	1.540
1988	35	0.442	0.982	1.572
1989	36	0.450	1.000	1.599
1990	37	0.457	1.015	1.624
1991	38	0.462	1.028	1.644
1992	39	0.468	1.040	1.664
1993	40	0.473	1.052	1.682
1994	41	0.478	1.062	1.700
1995	42	0.482	1.072	1.714
1996	43	0.486	1.079	1.727
1997	44	0.489	1.086	1.738
1998	45	0.491	1.092	1.746
1999	46	0.493	1.096	1.754
2000	47	0.495	1.099	1.759
2001	48	0.496	1.102	1.763
2002	49	0.496	1.103	1.764
2003	50	0.496	1.102	1.762
2004	51	0.494	1.098	1.757
2005	52	0.492	1.092	1.748
2006	53	0.488	1.084	1.734
2007	54	0.482	1.072	1.715
2008	55	0.475	1.056	1.689
2009	56	0.463	1.028	1.645
2010	57	0.449	0.999	1.598
2011	58	0.435	0.967	1.547
2012	59	0.419	0.931	1.490
2013	60	0.399	0.886	1.417
2014	61	0.373	0.829	1.326
2015	62	0.359	0.798	1.277
2016	63	0.346	0.769	1.231
2017	64	0.333	0.741	1.186

SOURCE: Clingman and Burkhalter (2018).

Appendix C: Components of the Totalization-Model PIA Calculation

Table C-1 presents the data underlying the totalization-model PIA estimates in Tables 5–9. See Appendix A for a description of how REP and theoretical AIME and PIA are calculated. As noted in Appendix A, the theoretical PIA is prorated using the ratio of covered QCs to total lifetime QCs to determine the totalization-model PIA. Thus, for a worker with 10 years of covered employment, the QC ratio is 0.2857. For a worker with 24 years of covered employment, the QC ratio is 0.6857.

Table C-1.
Factors underlying the totalization-model PIA estimates in Tables 5–9, by duration and timing of covered employment and earnings level: Workers born in 1953

Covered employment timing	REP	Theoretical AIME ($)	Theoretical PIA ($)	Totalization-model PIA ($)
10 years in covered employment, 34 years in noncovered employment [a]				
		High earner		
Early career	0.98	3,697	1,662	475
Middle career	1.71	6,462	2,295	656
Late career	1.44	5,435	2,141	612
Early and late career (sandwich)	1.01	3,805	1,697	485
		Medium earner		
Early career	0.61	2,311	1,219	348
Middle career	1.07	4,039	1,772	506
Late career	0.90	3,397	1,566	447
Early and late career (sandwich)	0.63	2,380	1,241	354
		Low earner		
Early career	0.28	1,040	812	232
Middle career	0.48	1,817	1,061	303
Late career	0.41	1,528	968	277
Early and late career (sandwich)	0.28	1,070	821	235
24 years in covered employment, 20 years in noncovered employment [b]				
		High earner		
Early career	1.35	5,092	2,089	1,433
Middle career	1.67	6,303	2,271	1,557
Late career	1.62	6,097	2,240	1,536
Early and late career (sandwich)	1.27	4,799	2,015	1,382
		Medium earner		
Early career	0.84	3,183	1,498	1,027
Middle career	1.04	3,914	1,732	1,187
Late career	1.01	3,811	1,699	1,165
Early and late career (sandwich)	0.80	2,999	1,439	987
		Low earner		
Early career	0.38	1,432	937	643
Middle career	0.47	1,773	1,046	718
Late career	0.45	1,714	1,028	705
Early and late career (sandwich)	0.36	1,350	911	625

SOURCE: Author's calculations using OCACT's earnings-by-age scaling factors.

NOTES: High earners are assumed to earn 160 percent of the AWI, medium earners are assumed to earn 100 percent of the AWI, and low earners are assumed to earn 45 percent of the AWI.

The totalization agreement formula is restricted to workers who are not fully insured (that is, with fewer than 40 QCs) for U.S. Social Security. These calculations apply the totalization formula hypothetically to fully insured workers.

a. The ratio of covered QCs to total lifetime QCs is 0.2857 (40 ÷ 140).

b. The ratio of covered QCs to total lifetime QCs is 0.6857 (96 ÷ 140).

Notes

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[1] Workers in noncovered employment are exempt from Social Security payroll taxes. In retirement, they receive pension income in lieu of Social Security benefits.

[2] In December 2018, SSA applied the WEP to 1,863,084 beneficiaries, of whom 93.8 percent (1,747,212) were retired workers. An additional 0.7 percent of affected beneficiaries were disabled (13,345) and 5.5 percent (102,527) were spouses and children (Li 2019).

[3] The taxable maximum caps the amount of annual earnings subject to Old-Age, Survivors, and Disability Insurance (OASDI) taxes but it also limits the earnings level on which monthly benefits are computed. SSA adjusts the taxable maximum each year to reflect changes in the national average wage. In 2019, the taxable maximum is $132,900. For more information, see https://www.ssa.gov/oact/cola/cbb.html.

[4] For example, for a worker born in 1953 (first eligible for retired-worker benefits at age 62 in 2015), nominal age-21 earnings in 1974 are multiplied by a wage-indexing factor of 5.59, which is the ratio of the national average wage in 2013, when the worker reached age 60 ($44,888), to the average wage in 1974 ($8,030). The wage-indexing factor for this worker's age-22 earnings in 1975 is 5.20 ($44,888 ÷ $8,630) and decreases with each successive year of earnings (except 2009, when the national average wage dipped slightly) until reaching 1.00 for earnings at age 60 and afterward.

[5] Zero-earning years are included in the computation for eligible workers with fewer than 35 years of covered earnings.

[6] Social Security reduces the number of computation years for disabled and retired-disabled beneficiaries to reflect a working career shortened by disability.

[7] The PIA equals the monthly benefit for a worker who claims retirement benefits in the month of attaining full retirement age. Benefit amounts are reduced for early claiming or increased for delayed claiming.

[8] A worker's covered earnings must meet a threshold to qualify as a YOC. In 2018, the YOC threshold was $23,850. For earnings in 1978 and later, SSA calculates the annual YOC threshold using a base that is indexed to wage growth. For a full description, see https://www.ssa.gov/oact/cola/yoc.html.

[9] The National Education Association is one prominent example of a proponent of WEP repeal (see http://www.nea.org/home/16491.htm).

[10] QCs measure accrued earnings. QC values are indexed annually to wage growth. In 2018, a QC was equal to $1,320. Covered workers may earn up to four QCs per calendar year. For more information, see https://www.ssa.gov/oact/COLA/QC.html.

[11] The AWI is expressed as a dollar amount rather than an index value. For a description of how SSA uses the AWI, and a tabular list of the AWI values from 1951 forward, see https://www.ssa.gov/oact/cola/AWI.html.

[12] The formula proposed in H.R. 6489 is mathematically identical to one put forth 1 year earlier in Social Security Advisory Board (2015). Similarly, the Bipartisan Policy Center would replace both the WEP and GPO formulas with ones that include data on noncovered earnings (Akabas and Ritz 2016).

[13] The AWI for 2016 ($48,642.15) was the most recent available to Clingman and Burkhalter. Thus, for 2016, the medium earner had average annual earnings (not scaled for age) equal to $48,642. The low and high earners averaged $21,889 and $77,827, respectively.

[14] Ten years is the minimum needed to be eligible for a retired-worker benefit. I chose the 24-year alternative to represent a worker with a current-law WEP bend-point factor ranging between 40 percent and 90 percent and to facilitate the construction of covered-work career-timing profiles.

[15] Clingman and Burkhalter (2018) indexed workers' annual earnings through age 64 and assumed benefit take-up at age 65.

[16] A 2013 report of the Wisconsin Legislative Council indicated that 45 percent of public retirement systems (39 of a nationwide sample of 87) used a 5-year average of final employee earnings to compute pension amounts. That report also found that the average multiplier for the 17 plans for employees not covered by Social Security was 2.1 percent. In Congressional testimony, the Government Accountability Office (2007) gave, as an example of a public retirement plan, a pension computation formula using a 3-year final earnings average and a 2 percent multiplier. The Wisconsin study noted that 20 public retirement plans increased their final-year averaging between 2010 and 2012, and that the general trend was toward lower multipliers in the benefit formula (Schmidt 2013).

[17] For the totalization-model PIAs computed in this analysis, I applied the REP to earnings accrued at ages 21–64. The formula was therefore comparable to the OCACT scaling-factor methodology and the same as that used to compute the current-law standard and WEP PIAs and the CER PIA. This methodology differs slightly from SSA's actual totalized benefit calculation.

[18] In 2017, 232,910 beneficiaries were receiving totalized Social Security benefits, and the average totalized benefit amount was $241.85 (SSA 2019, Table 5.M1). Totalization benefits are generally modest because of prorating.

References

Akabas, Shai, and Ben Ritz. 2016. "One Social Security Reform that Democrats and Republicans Agree On." Washington, DC: Bipartisan Policy Center. https://bipartisanpolicy.org/blog/one-social-security-reform-that-democrats-and-republicans-agree-on/.

Brown, Jeffrey R., and Scott Weisbenner. 2012. "The Distributional Effects of the Social Security Windfall Elimination Provision." National Bureau of Economic Research Working Paper No. 18342.

Clingman, Michael, and Kyle Burkhalter. 2018. "Scaled Factors for Hypothetical Earnings Examples under the 2018 Trustees Report Assumptions." Actuarial Note No. 2018.3.

Committee on Finance, United States Senate. 1977. *Summary of H.R. 9346, the Social Security Amendments of 1977 as Passed by the Congress (P.L. 95-216).* Washington, DC: Government Printing Office.

Government Accountability Office. 2007. *Social Security: Issues Regarding the Coverage of Public Employees.* Testimony before the Subcommittee on Social Security, Pensions, and Family Policy, Committee on Finance, U.S. Senate. GAO-08-248T. Washington, DC: GAO.

Jackson, Brent W., and Scott Cash. 2018. "Social Security Totalization Agreements." *Social Security Bulletin* 78(4): 1–11.

Li, Zhe. 2019. *Social Security: The Windfall Elimination Provision (WEP).* CRS Report No. 98-35. Washington, DC: Congressional Research Service.

Olsen, Anya, and Russell Hudson. 2009. "Social Security Administration's Master Earnings File: Background Information." *Social Security Bulletin* 69(3): 29–45.

Schmidt, Daniel. 2013. "2012 Comparative Study of Major Public Employee Retirement Systems." Madison, WI: Wisconsin Legislative Council.

Social Security Administration. 1976. "Notes and Brief Reports: Social Security Act Amendments." *Social Security Bulletin* 39(3): 29–31.

———. 2019. *Annual Statistical Supplement to the Social Security Bulletin, 2018.* Publication No. 13-11700. Washington, DC: SSA.

Social Security Advisory Board. 2015. "The Windfall Elimination Provision: It's Time to Correct the Math." Washington, DC: SSAB.

SSA. *See* Social Security Administration.

Waldron, Hilary. 2006. "Notes from Meeting on Administrative Earnings Data." Unpublished staff memorandum. Baltimore, MD: SSA.