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Zooming in on ZIP Codes: Using Socio-Economic Factors to Tailor U.S. Pension Plan Longevity Assumptions

By Daniel Reddy and Erik Pickett

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Chairperson's Corner

By Douglas Fiddler

During one of the Social Insurance and Public Finance (SIPF) Section Council meetings last year, we spent a great deal of time discussing the nature of the SIPF Section—that we are comprised of actuaries who have an interest in either social insurance programs or benefit plans for government employees. Section members do not all practice in the same discipline, and, indeed, the section council composition reflects the diversity of interest with actuaries who practice in public pensions or OPEB plans, health insurance or social insurance plans such as Social Security and Medicare.

I joined the Society of Actuaries' (SOA) SIPF Section because I am particularly interested in retirement systems for government employees and the impact those systems have on public finance. That has been my sole area of practice for roughly half of my 30-plus-year career. As an actuary, a taxpayer and—hopefully someday—a recipient of Social Security and Medicare, I am keenly interested in the sustainability of those programs.

Annual reports from the Social Security Administration have detailed the sustainability issues of social insurance programs under current law. Likewise, without much effort, you can find daily articles decrying the "lack of sustainability" in public employee benefit plans. But often lost in that discussion is the wide range of funding conditions among public plans as well as the nuances between accounting and funding calculations.

Even beyond funding conditions, the funding approaches and benefit structure vary tremendously from one state to another. Some of my colleagues on the SIPF Section Council work in states with constitutional guarantees of benefits where plans adapt to changing economic and demographic conditions through contribution changes or new benefit tiers for future hires. At the other end of the spectrum are states that have transitioned to primarily defined contribution plans, with the plan member bearing all or most of the investment and longevity risk.

There are also a growing number of public pension plans that share risk between employers (or, arguably, taxpayers) and plan members. The risk-sharing mechanisms are typically unique but generally seek to capture the risk-pooling efficiencies of defined benefit plans within a structure that limits the risk of future contribution burdens on the employers and taxpayers. I think you will see more risk-sharing plans or features in the future. But these plans are not one-size-fits-all solutions that can be applied anywhere. A risk-sharing plan that works in Wisconsin or South Dakota would likely not even be considered in many locations.

There are different ways to sustainably fund and manage social insurance and public benefit plans, and one is not necessarily better than another. During my career, I've learned it is extremely beneficial to articulate your goals for the program,

establish the components that are fixed, define acceptable limits for components that will change, and design steps to take to adapt when unexpected conditions arise and the acceptable limits are crossed.

Unexpected conditions will arise, and social insurance programs and benefit plans for public employees must be able to adapt to new conditions. Change is inevitable. Part of our role as actuaries is to assess plans and proposed changes to those plans in a variety of circumstances. Most importantly, we must always be willing to learn from others and consider ideas that may challenge our understanding and the status quo.

Many public pension and OPEB plans will face significant challenges in the next few years. There are also some intriguing proposals for changes to Social Security and Medicare that will undoubtedly be the topic of much debate during this election year. Actuaries can and must add valuable insight to those discussions.

This year, the SIPF Section Council will develop several webcasts, meeting sessions and articles that address the evaluation and management of public employee benefit plans and social insurance programs or proposals to change those programs. We anticipate they will share ideas that are working well for some and can be adapted to others.

To augment these communication channels, we recently began a series of podcasts interviewing actuaries and others working in social insurance or public plans. One of the key questions we are asking is "What do you wish your actuary understood about your perspective?" I think this will provide a great insight into ways we can improve our communication with stakeholders.

As always, if you have ideas you would like to share or areas you would like to see addressed, please reach out to me, other council members or the SOA staff. Your input and suggestions are welcome. ■

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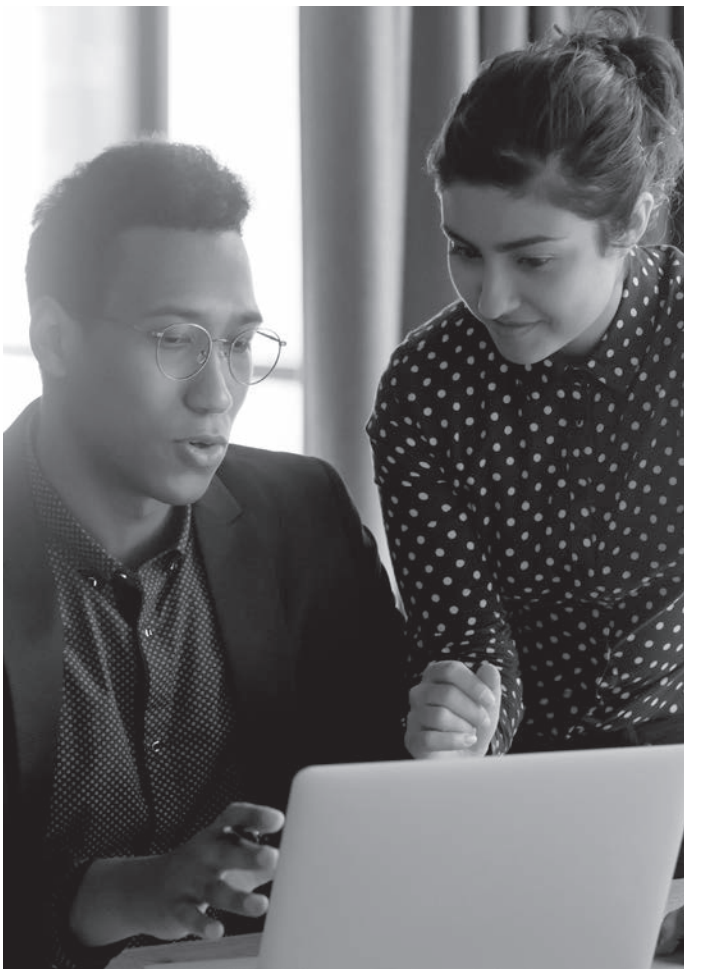
Letter From the Editor: Any Questions?

By Bruce D. Schobel



In the previous issue of this newsletter, I asked each of you to look back on your work during the past few years and try to find something that may be useful—or merely interesting—to other actuaries with interests similar to yours. I have received some great contributions from readers, and the request still stands. If you find something that you produced and have time to describe it in a few pages, please prepare a draft article and send it to me. You are unlikely to become a famous author, but you will be contributing to the vast body of knowledge that underlies actuarial science. The newsletter has some practical limits on article length, so if your contribution is long, please attempt to summarize it. Interested readers who have questions or need additional background material are always told how to contact authors. Those contacts sometimes lead to valuable collaborations.

And speaking of questions, this issue contains the fourth article in a series that I wrote in response to one. On a monthly section council conference call a couple of years ago, someone asked a question about Social Security coverage of state and local government employees. As often happens, the answer (from me) was much longer than the question and led to the revealing of a wealth of special rules and other considerations related to the topic. That, in turn, led to a suggestion that I write something that could serve as a reference for section members and other interested readers. That's a primary purpose of a section newsletter, of course, so I jumped at the opportunity. The subject also resides at the happy intersection of two groups that make up most of our section membership: (1) social insurance practitioners and (2) actuaries for public-sector (mostly state and local) pension plans. Thus, the subject should be of some interest to just about everyone who reads this newsletter.

The subject was too large for one brief article and would have taken too long to write for the next issue of the newsletter. Therefore, I broke it down into four smaller articles and wrote them one at a time. Later in this issue is the last article in the series, describing Social Security's two special benefit-computation provisions that apply to certain beneficiaries who also receive pensions based in whole or in part on noncovered employment. I hope that readers find (and have found) these articles informative and useful.

If readers have any questions about the professional areas of responsibility that fall within this section's purview, please send those questions to me or to any section council member. We may not be able to answer the question ourselves, but we probably know someone who can. And even more importantly, the fact that one person has asked a question implies that others may be wondering about the same thing. If so, then a newsletter article or an event, like a webcast or meeting session, could be of broad general interest. We have to get ideas from somewhere, and what better source could there be than questions from section members?

We are waiting to hear from you. Thank you in advance for your contributions to this newsletter, the SIPF Section, the Society of Actuaries (SOA) and the actuarial profession! ■

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Zooming in on ZIP Codes: Using Socio-Economic Factors to Tailor U.S. Pension Plan Longevity Assumptions

By Daniel Reddy and Erik Pickett

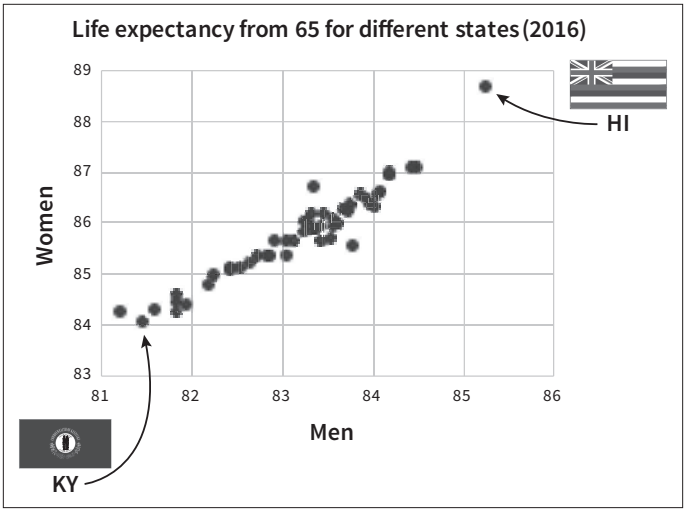
A DIVERSE NATION

The United States is a diverse nation made up of many people with distinctly different characteristics. This diversity is particularly noticeable when you analyze life expectancy.

Figure 1 shows the average life expectancy for men and women for each state in the U.S. Each state itself is made up of a diverse mix of people, but even so, the state average life expectancies are very different from state to state, with more than four years of difference in life expectancy from Kentucky to Hawaii.

What is contributing to this diversity, and how can pension plans account for it when setting their longevity assumptions?

Figure 1
State Variations in Life Expectancy



Source: Club Vita analysis of Barbieri, Magali, and John, Wilmoth. 2019. United States Mortality Table. March 4, *http://usa.mortality.org* (accessed Nov. 12, 2019).

Nurture, not Nature

Many believe that longevity is passed down through the genes we inherit from our parents, but research suggests that only about 20 percent of the differences in life expectancy comes from our genes.[1] The majority is driven by external factors such as lifestyle and environment.

Some key characteristics that indicate how long individuals will live include their level of education, whether they smoke, how much exercise they get, the type of job they have, how wealthy they are and even how much sleep they get. Many of these factors are not possible for pension plans to measure; however, Club Vita can use the data fields that pension plans do hold to create effective proxies.

How can Pension Plans Capture This Diversity?

As displayed in Table 1, the following drivers of longevity can be captured by data fields routinely held by pension plan administrators.

Table 1
Longevity Drivers and Pension Administration Proxies

	Longevity Driver	Data Item Used as a Proxy
	Lifestyle (level of education, propensity to smoke, etc.)	ZIP code
	Affluence	Ideally salary, otherwise pension amount
	Retirement health	Disabled or normal health retirement
	Occupation	Blue- or white-collar worker

Categorizing participants using these different data fields (often referred to as "rating factors") gives us a granular method for understanding a social security system's or pension plan's demographics. By comparing each participant to the experience of other participants in the Club Vita data set with similar characteristics, we can then derive a longevity assumption appropriate for that participant within the social security system or pension plan.

Zooming In

We've seen that longevity varies state to state. This is largely driven by the different lifestyles of people living in different places. But can we zoom in further and capture more diversity using details about where people live?

Marketers have long appreciated that analyzing ZIP codes helps them spend their budgets more wisely. Pension plan sponsors can repurpose these techniques to refine their understanding of the longevity of their members.

CAPTURING LIFESTYLE EFFECTS USING ZIP CODE

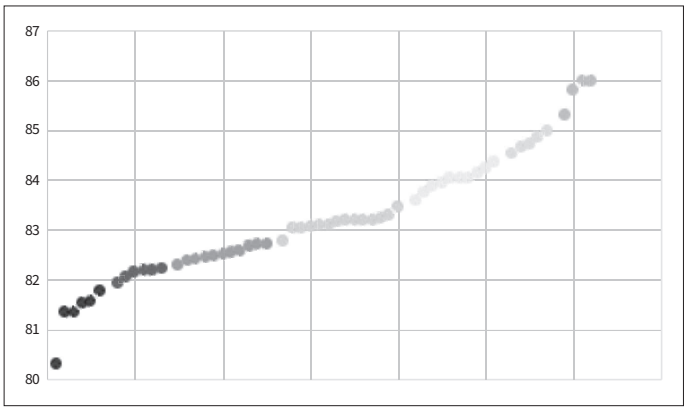
Where individuals live can tell us a lot about their lifestyle and, therefore, about how long they are expected to live. This information is encoded within the 9-digit ZIP code (commonly known as the ZIP+4 code). We prefer ZIP+4 code because there are some very large (100,000-plus resident) 5-digit ZIP codes in the U.S., limiting our ability to identify lifestyle effects. So, how do we get to capturing lifestyle effects based on ZIP+4?

First, we repurpose some key principles that marketers use (see Figure 2).

- **Marketing principle 1:** People living in the same neighborhood have similar characteristics.
- **Marketing principle 2:** Neighborhoods can be characterized by the types of people living there.
- **Marketing principle 3:** Neighborhoods with the same characteristics appear all over the country.

Figure 2
Marketing Categorizations

Figure 3
Life Expectancy by Marketing Group



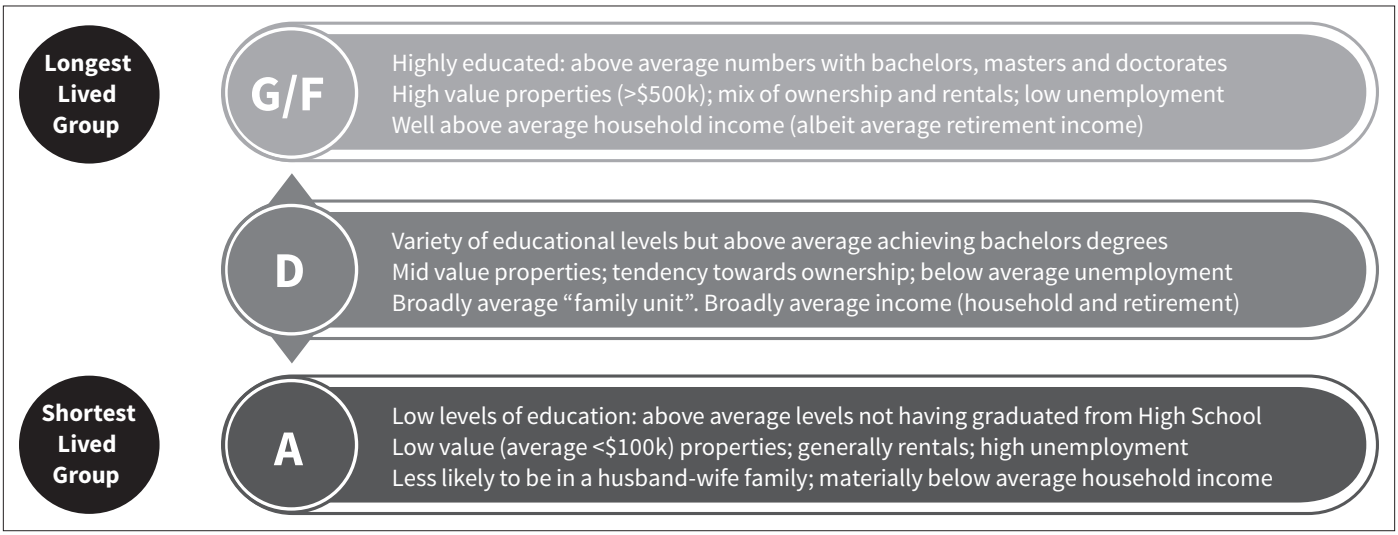
While there are more than 46 million ZIP+4 codes in the U.S., this marketing classification puts each ZIP+4 code into one of 58 different types of neighborhoods.

- **Longevity modeling principle:** Neighborhoods with similar characteristics have similar longevity.

We analyze longevity experience data for people living in each of the different marketing groups and order them from shortest life expectancy to longest life expectancy. We then use a clustering algorithm to simplify the classification of ZIP+4 codes by combining the marketing groups that have similar longevity experience.

This process gives us seven groups exhibiting distinct longevity experience for men (see Figure 3) and six for women. We color-code these "longevity groups" from light to dark, as shown in Figure 4.

Figure 4
Description of Longevity Groups



Source: Club Vita summary of longevity group characteristics

INTRODUCING VITACURVES

ZIP+4 codes enable us to capture large differences in life expectancy, but there are other factors, most notably income, that also lead to considerable variation of life expectancy. Club Vita's approach is to combine the effects of multiple factors including ZIP+4, pension amount, and blue- and white-collar worker into a highly predictive model of current (or "baseline") longevity. We call this the VitaCurves model. The techniques we are describing here have been tried and tested in the U.K.[2] and Canada.[3]

The starting point is the data set underlying our calculations (see Figure 5).

How do we Build the VitaCurves Model?

We split each data field into distinct buckets. Each individual retiree in our data set will be characterized by how the retiree's data fit into each bucket, as shown in Table 2.

We apply a statistical technique called "Generalized Linear Modeling" to our data set to build up a picture of how each data field influences an individual's longevity. We use this technique to calculate an individual longevity assumption, or VitaCurve, for each combination of our data fields. For our first-generation model, we generate 306 VitaCurves (see Figure 6, pg. 11).

The first generation of VitaCurves captures a difference in life expectancy from 65 of 8.7 years for men and 6.6 years for women. Here we show how the different ratings factors contribute to this diversity.

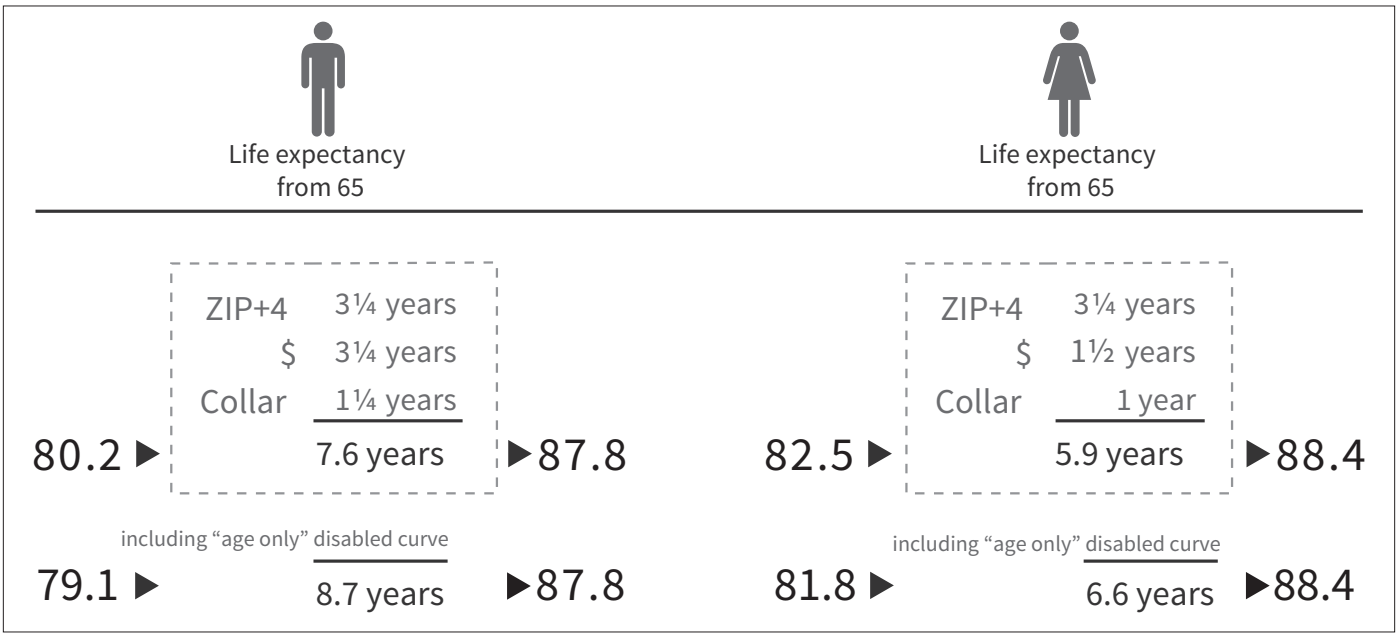
Figure 5
Data Set Characteristics

- The size of our data set is key to make our calculations statistically significant.
- The more data we have, the more we can identify the signal through the noise.
- Our first-generation U.S. VitaCurves model is built on a data set of more than 800,000 retirees from a diverse portfolio of 108 large plans.
- The richness of our data set is key to capture the full diversity between different retirees.
- The more data fields we collect, the more diversity we can capture between retirees.
- Our first-generation U.S. VitaCurves model uses the data fields: ZIP+4, pension amount, blue- and white-collar, first and second life, gender, disabled and normal health.

Table 2
Rating Factors Used in U.S. VitaCurves Model

Data Field	Retiree Men	Retiree Women
Pension amount	6 pension bands	3 pension bands
ZIP+4	7 longevity groups	6 longevity groups
Collar	Blue and white collar	Blue and white collar

Figure 6
Life Expectancy Range and Attribution to Ratings Factors of U.S. VitaCurves



Source: Club Vita US VitaCurves analytics

SOCIAL INSURANCE AND PUBLIC FINANCE

There are many implications of acknowledging and using this information in the U.S. pension system, especially when defined broadly to include all retirement plan types, Social Security and Medicare.

1. Tailored mortality assumptions lead to more accurate cost calculations and stability of liabilities when measured one year to the next.

2. Better cash flow and headcount projections lead to better understanding of both pension plans' and social security systems' future costs and sustainability. The level of plan and system maturity is better understood as well—knowing how many active employees or taxpayers and their level of income support current and future retirees is important.

3. Knowing the real difference in life expectancies for different groups helps to quantify the degree of the intra- and inter-generational equity existing in the social security system.

4. The shift in defined benefit to defined contribution type retirement benefits has been moving risk from plan sponsors to plan participants. That includes not only investment risk but longevity risk as well. Individual defined contribution savers need to understand their individual longevity risk better. Incorporating this Club Vita's analysis into tools calculating probabilities of living to certain ages (such as the Actuaries Longevity Illustrator[4]) will help individuals tailor savings targets.

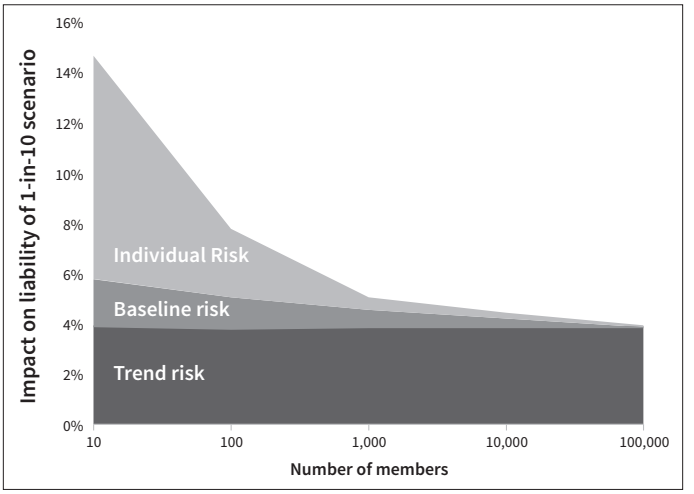
5. Longevity risk is better-understood by the actuarial community in the U.K. but is not yet part of most U.S. risk conversations. Extreme longevity has been rated among the top 15 extreme risks by the Thinking Ahead Institute in 2019.[5] Longevity risk can be broken down into subcomponents:

   a. **Individual (or idiosyncratic) risk:** This is the risk that certain members of a population live significantly longer (or shorter) lives than that predicted, driven by the natural variation in a population. The law of large numbers in a social insurance or any large pension plan means this risk is mainly mitigated by pooling the exposure of a large number of participants.

   b. **Baseline risk:** This is the risk that the exposed population differs from the population used to calculate the current longevity assumption. This could be better managed by sophisticated social insurance and pension plan sponsors using accurate assumptions that are highly tailored to their plan's population.

c. **Long-term trend risk:** This is the risk that comes from long-term mortality improvements being greater (or lower) than expected. Social insurance plans are most exposed to this risk. In 2020, Club Vita aims to understanding how the long-term trends in the U.S. vary by socio-economic factors, through the power of ZIP+4 code (see Figure 6).

Figure 6
Components of Longevity Risk



Source: Club Vita analytics of longevity risk components.

DETAILS ON THE MODELING METHODOLOGY

Further technical details on the underlying data and modeling methodology can be found in the supporting documents at *https://www.clubvita.us/zooming-in-on-zip-codes*. ■

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ENDNOTES

1 See for example Gavrilova, Natalia S., Leonid A., Gavrilov, Galina N., Evdokushkina, Victoria G., Semyonova, Anna L., Gavrilova, et al. 1998. Evolution, Mutations, and Human Longevity: European Royal and Noble Families. *Human Biology* 70, no. 4:799–804. *https://www.ncbi.nlm.nih.gov/pubmed/9686488* (accessed Nov. 12, 2019) or Skytthe, Axel, Kirsten Ohm, Kyvik, Niels Vilstrup, Holm, and James W., Vaupel. 2002. The Danish Twin Registry: 127 Birth Cohorts of Twins. *Twin Research* 5, no. 5:352–357. *https://www.ncbi.nlm.nih.gov/pubmed/12537858* (accessed Nov. 12, 2019).

2 Madrigal, A.M., F.E., Matthews, D.D., Patel, A.T., Gaches, et al. 2011. What Longevity Predictors Should Be Allowed for When Valuing Pension Scheme Liabilities? *British Actuarial Journal* 16, no. 1:1–62. *https://www.cambridge.org/core/journals/british-actuarial-journal/article/what-longevity-predictors-should-be-allowed-for-when-valuing-pension-scheme-liabilities/3C7E032BF549D497D3ABEE506CFF67EF* (accessed Nov. 12, 2019).

3 Ahmadi, Seyed Saeed, and Richard, Brown. 2018. Canadian Institute of Actuaries, May, *https://www.cia-ica.ca/docs/default-source/2018/218068.pdf* (accessed Nov. 12, 2019).

4 Actuaries Longevity Illustrator. Welcome to the Actuaries Longevity Illustrator. *https://www.longevityillustrator.org/* (accessed Nov. 12, 2019).

5 Thinking Ahead Institute. Extreme Risks 2019. *https://www.thinkingaheadinstitute.org/-/media/TAI/Pdf/Research-Ideas/a_public/Extreme_Risk_2019.pdf* (accessed Nov. 12, 2019).

Computing Social Security Benefits for Certain Government Employees

By Bruce D. Schobel

Today, somewhat more than 20 million people are employed by state and local governments across the U.S. Almost three-quarters of those employees are covered by Social Security, mostly under voluntary-coverage agreements permitted by Social Security Act section 218. (These agreements were described in the July 2019 issue of *In the Public Interest*.) A much smaller number, 2.4 million individuals, are covered mandatorily by Social Security under a provision enacted into law as section 11332 of the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), effective on July 2, 1991. (That provision is explained in the January 2019 issue of *In the Public Interest*.)

About 6 million state and local governmental employees do *not* have Social Security coverage in their current government jobs, either mandatorily or voluntarily. Such noncovered workers may, however, receive Social Security benefits based on other employment. Many (even most) of these noncovered employees may have been or will be covered by Social Security in their previous, subsequent or even simultaneous other jobs, whether in the private or the public sector. Relatively few people work their entire careers in noncovered employment.

Workers with 40 lifetime coverage credits—about 10 years of work in Social Security-covered employment or self-employment—become eligible for Social Security retired-worker benefits at age 62 (although many workers wait until they are older to claim benefits). Ten years of covered employment in a lifetime is fairly easy to obtain, even for workers whose primary employment was noncovered. In 2020, workers with just $5,640 in Social Security-covered earnings receive four coverage credits for the year, without regard to how many days they actually worked during the year.

Workers with careers split between covered and noncovered employment (not necessarily at the same time) may not receive the same benefits that workers with only covered employment receive. The Social Security Act provides two special benefit formulas for people receiving pensions based in whole or in part on employment that was not covered by Social Security. The reasoning behind these special formulas is that people with employment histories split between covered and noncovered employment appear to be poorer than they really are, when one examines only their *covered* earnings histories. In the absence of special rules, these not-really-poor people would be able to receive—and, in fact, used to receive—subsidies, including the one built into the design of Social Security's weighted-benefit formula. Those subsidies were and still are intended to go to lower-income workers and their families, not to relatively high-income government employees who only appear to be low income.

The special benefit formulas that may apply to former governmental employees apply only to those retirees *receiving pensions* based on noncovered employment. Receipt of a pension is a threshold test for determining whether the noncovered employment was substantial. People who worked for just a short time in noncovered employment, not long enough to receive a pension based on that employment, generally have their benefits computed using Social Security's regular benefit formulas, without any adjustments.

The two special benefit formulas that may apply to governmental retirees are as follows:

1. **Government pension offset (GPO).** This provision was first enacted into law in 1977 and significantly amended in 1983 to mitigate its impact in certain cases. The GPO affects benefits payable to spouses and surviving spouses (and divorced spouses and surviving divorced spouses, provided that the marriage lasted at least 10 years before ending in divorce). This provision does not affect a worker's own benefit as a retired or disabled worker, based on the individual's earnings record under Social Security. The GPO does, however, often prevent government retirees from receiving any Social Security benefits as spouses or widow(er)s because it reduces such benefits by two-thirds of the amount of the governmental pension but not below zero, of course.

   For example, a governmental retiree receiving a pension of $3,000 a month *based on noncovered employment* would have the Social Security benefit as a spouse or widow(er) reduced by two-thirds of that amount, or by $2,000. In most cases, a reduction of that magnitude reduces the Social Security auxiliary benefit to zero. Again, the GPO does *not* affect the worker's *own* benefit (i.e., the retired-worker benefit based on the individual's own earnings record), just auxiliary benefits that the worker may otherwise be able to receive based on a spouse's, deceased spouse's or ex-spouse's earnings record.

Many government employees working in noncovered employment have no idea—or just the most superficial understanding—of the special rules that may affect their future Social Security benefits.

2. **Windfall elimination provision (WEP).** This provision was enacted into law in 1983 and provides a special benefit-computation formula for retired-worker and disabled-worker benefits. The WEP removes some of the weighting in Social Security's usual benefit formula, which gives larger replacement rates to low-income retirees than to high-income ones. In the most extreme cases, the lowest-income beneficiaries can get a 90-percent replacement rate from Social Security. Most governmental retirees get much less of that weighting because the WEP reduces the 90-percent bracket in the primary insurance amount (PIA) formula to 40 percent. About 2 million beneficiaries (about 3 percent of the total), mostly retired workers, have their benefits reduced because of the operation of the WEP provision.

   Governmental retirees with more than 20 years of *substantial* covered employment (defined for 2020 as earnings of at least $25,575) under Social Security can get more than the 40 percent standard percentage that applies to the first bracket of the PIA formula under the WEP provision. That percentage grades from 40 percent up to the full 90 percent, in 5 percent increments, for those with 20 years to 30 or more years of substantial Social Security-covered employment. In addition, the WEP provision has a guarantee that any reduction in a worker's PIA is limited to 50 percent of the individual's pension based on noncovered employment.

   The WEP, unlike the GPO, affects the worker's own benefit and any auxiliary benefits paid on the worker's earnings record while the individual is alive. Interestingly, the WEP does *not* affect the computation of benefits payable to the widow(er) of a worker whose retired-worker or disabled-worker benefit was computed using the WEP formula. After the worker's death, the WEP provision ceases to apply.

Many government employees working in noncovered employment have no idea—or just the most superficial understanding—of the special rules that may affect their future Social Security benefits. As a result, these employees often expect to receive significantly more retirement income than they will actually receive. Contributing to this problem is the fact that SSA itself does not know who will be affected by the GPO or the WEP until those individuals apply for benefits and disclose that they are receiving pensions based on noncovered employment. Until then, the personalized earnings and benefit estimate statements that SSA provides upon request will overstate potential future benefits. ■

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Proposals for Social Security Reform

By Chris Chaplain

The Social Security Administration's Office of the Chief Actuary performs estimates for a wide variety of proposals to make changes to Social Security. Many proposals address the long-range solvency deficit for Social Security's Old-Age and Survivors Insurance (OASI) and Disability Insurance (DI) Trust Funds.[1] Other proposals make revisions to specific aspects of Social Security law without significant effects on long-term solvency. This article will discuss and provide examples of both types of proposals.

COMPREHENSIVE SOLVENCY PROPOSALS

In the *2019 Social Security Trustees Report* (*https://www.ssa.gov/OACT/TR/2019/tr2019.pdf*), the combined OASI and DI Trust Funds are projected to be unable to pay full benefits in years 2035 and later. The financing shortfall is often expressed in terms of the 75-year actuarial balance, which is essentially the difference between the present value of future projected program income and program cost, as a percent of the present value of taxable payroll[2] over the 75-year valuation period. For the intermediate (best estimate) assumptions of the *2019 Trustees Report*, the actuarial balance is –2.78 percent of taxable payroll, or, equivalently, the "actuarial deficit" is 2.78 percent of taxable payroll. The actuarial deficit represents the average amount of change in currently scheduled income or cost that will be needed over the valuation period in order to result in an ending trust fund reserve equal to one year's cost.

The actuarial deficit can be eliminated through increases in scheduled revenue, decreases in scheduled cost or some combination of both. Some proposals attempt not only to achieve solvency throughout the 75-year period but to assure that the trust funds will remain solvent for the foreseeable future beyond the 75th projection year. This concept is called "sustainable solvency," which in addition to 75-year solvency, requires that the "trust fund ratio" of trust fund reserves to the following year's program cost be steady or rising at the end of the 75th year.

The following are descriptions of three recent comprehensive solvency proposals that would achieve sustainable solvency in different ways.

1. The Social Security 2100 Act—introduced on Jan. 30, 2019, by Chairman John Larson, Senator Chris Van Hollen, and Senator Richard Blumenthal—increases the OASDI payroll tax rate from 12.4 percent to 14.8 percent by 2043 and eventually fully eliminates the OASDI contribution and benefit base (currently at a level of $132,900 for 2019). The combination of these two revenue increases is large enough to allow for several benefit increases while still achieving sustainable solvency for the full proposal under the intermediate assumptions of the *2019 Trustees Report*. Table 1 provides brief descriptions of the provisions of the proposal, along with the estimated change in actuarial balance due to each provision. A letter from the Office of the Chief Actuary with detailed estimates appears at: *https://www.ssa.gov/OACT/solvency/LarsonBlumenthalVanHollen_20190918.pdf*.

Table 1
The Social Security 2100 Act, Introduced as H.R. 860 and S.269 on Jan. 30, 2019

Provision	Estimated Change in OASDI Actuarial Balance (as a Percent of Payroll)
Benefit Changes	
Increase the first PIA formula factor from 90 percent to 93 percent	−0.24
Use CPI measure for the elderly rather than current CPI for COLA increases	−0.41
Expand the current-law minimum benefit	−0.15
Increase income threshold amounts for taxation of Social Security benefits	−0.14
Revenue Changes	
Apply payroll tax rate on earnings over $400,000 initially and eventually on all earnings	1.93
Increase the combined OASDI payroll tax rate to 14.8 percent	1.87
Total for all provisions, including interaction	**3.18**

Based on intermediate assumptions of the *2019 Trustees Report*

2. The Social Security Reform Act of 2016, introduced on Dec. 8, 2016, by Representative Sam Johnson, specifies a number of reductions in scheduled benefits, including a revised lower-cost benefit formula, an increase in the full (normal) retirement age from 67 to 69, and a reduced COLA for all beneficiaries (including no COLA for beneficiaries with income exceeding specific levels). This bill also contains benefit increase provisions—such as expansion of a minimum benefit to long-career, low-wage workers; eventual full elimination of taxation of Social Security benefits; and an increase in benefits for those who have been eligible for Social Security benefits for at least 20 years and have relatively low income levels. No direct revenue increases are included in the proposal.

   The combination of these provisions decreases program costs enough for the proposal to achieve sustainable solvency under the intermediate assumptions of the *2016 Trustees Report*. Table 2 provides brief descriptions of the proposal's provisions, along with the estimated change in actuarial balance of those provisions with significant effects. A letter with detailed estimates appears at *https://www.ssa.gov/OACT/solvency/SJohnson_20161208.pdf*.

3. The Bipartisan Policy Center's Commission on Retirement Security and Personal Savings released a comprehensive Social Security solvency proposal on June 9, 2016. That proposal contained provisions that both increased revenue and decreased scheduled benefits. On a 75-year present value basis, revenue increases accounted for about 56 percent of the total effect, while net benefit decreases accounted for the remaining 44 percent. Revenue increases included (1) an increase in the contribution and benefit base by about 43 percent in the near term and by about 99 percent at the end of the 75-year projection period; and (2) a gradual increase in the payroll tax rate from 12.4 percent to 13.4 percent. Significant benefit decreases included (1) a mini-PIA calculation that can lower benefits for those with irregular earnings patterns; (2) a gradual increase in the normal retirement age; and (3) using a chained CPI measure for computing COLA, which is expected to lower the COLA by about 0.3 percentage points per year. The proposal also contains benefit increases to allow for student benefits up to age 22 (rather than age 18 under current law) and to expand the basic minimum benefit for beneficiaries who fall below specified income thresholds.

   The combination of these changes allows the proposal to achieve sustainable solvency under the intermediate assumptions of the *2016 Trustees Report*. Table 3 provides brief descriptions of the provisions of the proposal, along with the estimated change in actuarial balance of those provisions with significant effects. A letter with detailed estimates appears at *https://www.ssa.gov/OACT/solvency/BPCCRSPS_20161011.pdf*.

Table 2
The Social Security Reform Act of 2016, Introduced as H.R. 6489 on Dec. 8, 2016

Provision	Estimated Change in OASDI Actuarial Balance (as a Percent of Payroll)
Revise benefit formula to include factors of 95%, 27.5%, 5% and 2% instead of current-law 90%, 32% and 15%, on indexed earnings. Revise current law bend points	0.85
Use a mini-PIA approach rather than aggregating all earnings for computing the PIA	0.34
Alternative Windfall Elimination Provision approach using covered and noncovered earnings levels	0.03
Increase normal retirement age to 69	0.84
Use chained consumer price index for urban wage earners (C-CPI-U), estimated to be 0.3 pp lower than current law, for COLA if below certain income levels; no COLA if above those thresholds	1.25
Require full-time school enrollment at age 15 and higher for child benefits	0.01
Expand the current-law minimum benefit	–0.23
Eliminate the retirement earnings test at the earliest eligibility age	0.01
Eliminate taxation of Social Security benefits, phased in 2045–2054	–0.40
Provide additional benefit (5% of average wage index (AWI) earner benefit) for those eligible at least 20 years and below certain income thresholds	–0.07
Limit spouse benefit to that for a worker earnings the AWI each year	0.07
Total for all provisions, including interaction	**2.67**

Based on intermediate assumptions of the *2016 Trustees Report*

EXAMPLES OF PROPOSALS FOR SPECIFIC CHANGES

As previously mentioned, the Office of the Chief Actuary also provides estimates for proposals that do not materially affect the solvency of the OASDI program but do affect selected provisions of the Social Security Act. These proposals can have significant impacts for subgroups of beneficiaries. Descriptions of two types of proposals follow, with specific examples of each.

1. **Revised treatment of Social Security beneficiaries with noncovered pensions.** Many individuals, primarily those working for certain state and local governments, receive pensions based on work that Social Security does not cover. Those workers and their employers do not pay payroll taxes to Social Security for that noncovered work and then do not receive Social Security benefits based on that work. However, some of these individuals also have enough work that is covered by Social Security so that they would qualify for a Social Security benefit.

   Under current law, the Windfall Elimination Provision (WEP) reduces the Social Security benefit level by up to $463 for workers first eligible in 2019, depending on the amount of the pension they are receiving based on noncovered work. The rationale for the WEP derives from the Social Security benefit formula. The Social Security benefit formula treats workers who have Social Security coverage for only part of their career as if they were long-term, low-wage workers. Because of the progressivity of the benefit formula, these workers have the advantage of receiving a Social Security benefit representing a higher percentage of their earnings, plus a pension from a job for which they did not pay Social Security taxes. The WEP is designed to remove that advantage.

   Under H.R. 3934, the Equal Treatment of Public Servants Act of 2019, introduced by Representative Kevin Brady on July 24, 2019, the current-law WEP would eventually not apply and an alternative calculation would take its place. The alternative calculation modifies the benefit formula to reflect all past earnings (including earnings in noncovered employment). The resulting benefit is then multiplied by the ratio of the average indexed monthly earnings[3] computed

Table 3
Bipartisan Policy Center's Commission on Retirement Security and Personal Savings Plan, Released on June 9, 2016

Provision	Estimated Change in OASDI Actuarial Balance (as a Percent of Payroll)
Benefit Changes	
Use a mini-PIA approach rather than aggregating all earnings for computing the PIA	0.23
Alternative Windfall Elimination Provision and Government Pension Offset approach using covered and noncovered earnings levels	0.06
Limit spouse benefit to that received for worker at the 75th percentile of PIA	0.11
Convert couple benefit to a "joint and 75 percent survivor" annuity approach but equivalent in aggregate to current law	0.02
Revise benefit formula by adding bend point and factors of 95%, 32%, 15% and 5% rather than 90%, 32% and 15%	0.04
Increase normal retirement age to 69 in a gradual manner	0.50
Use chained CPI-U (0.3 pp lower than current law) for COLA for benefits paid out of OASI Trust Fund only	0.47
Extend student benefits to age 22	–0.06
Create a new basic minimum benefit for those with income below specific thresholds	–0.19
Revenue Changes	
Continually increase the contribution and benefit base beyond the current-law level (by about 99% in 75th year)	0.56
Increase payroll tax rate to 13.4 percent over a 10-year period	0.88
Include up to 100% of Social Security benefits in taxable income for single filers with specified income levels of $250,000+ and for joint filers with specified income levels of $500,000+	0.01
Total for all provisions, including interaction	**2.77**

Based on intermediate assumptions of the *2016 Trustees Report*

without noncovered earnings to a modified average indexed monthly earnings that includes both covered and noncovered earnings.

With this alternative calculation, the existence of a noncovered pension and the amount of that pension have no effect on an individual's final Social Security benefit amount. In contrast, as mentioned above, the noncovered pension and the amount of that pension do affect Social Security benefit amounts under the current-law WEP.

For H.R. 3934, individuals first eligible before 2021 receive a rebate of past WEP reductions. Those individuals first eligible after 2021 but before 2061 receive the higher of the current law WEP benefit and the alternative calculation previously mentioned. Individuals first eligible in 2061 and later get the benefit based on the alternative calculation, whether it is higher or lower than the current-law WEP amount. This proposal, as described in a July 24, 2019, letter (*https://www.ssa.gov/OACT/solvency/KBrady_20190724.pdf*), has a negligible impact on the long-range actuarial balance, that is, between –0.005 and 0.005 percent of taxable payroll.

Under H.R. 4540, the Public Servants Protection and Fairness Act, introduced by Representative Richard Neal on Sept. 27, 2019, the same alternative calculation would be part of the Social Security benefit determination. Individuals who have noncovered earnings and become eligible for OASDI benefits in 2022 or later would receive the higher of their benefit using this alternative calculation or the current-law WEP. The proposal would also provide for a relief payment for workers first eligible for a benefit before 2022 who are affected by the current-law WEP. The General Fund of the Treasury would reimburse the increased program cost for this bill; therefore, there would not be any direct effect on Social Security financing. Program cost and program income would both be increased by an estimated 0.02 percent of taxable payroll, as described in a Sept. 30, 2019, letter at *https://www.ssa.gov/OACT/solvency/RNeal_20190930.pdf*.

2. **Parental leave benefit proposals.** Several proposals since 2018 have provided for a new Social Security benefit of up to three months for individuals to care for a newborn child or newly adopted child. The benefit amount would be subject to meeting specific work requirements and would be calculated as if the parent(s) were eligible for a disabled worker benefit at the time of the birth or adoption. In return, either the individual's earliest eligibility age (EEA) and normal retirement age (NRA) would increase[4] or their benefits would be reduced by a specified future percentage reduction, depending on the proposal. The EEA/NRA increase option would generally result in a benefit decrease as compared to current law, because individuals would either wait longer to get the same dollar benefit or get a reduced benefit if first claiming a benefit at a specific age. Details for three of these proposals follow.

   - Senator Marco Rubio introduced S. 3345, the Economic Security for New Parents Act, on Aug. 1, 2018. Under this proposal, parental leave benefits would be available for births and adoptions in calendar years 2020 through 2023. Qualifying parents must take leave from work to receive the parental leave benefit. Parents may elect to receive parental leave benefits for the equivalent of three months, and their EEA and NRA for a future retired worker benefit would then be increased by two months for every equivalent month of parental leave benefit taken. Under this proposal, the General Fund of the Treasury would reimburse the OASI Trust Fund for the net cost of the parental leave benefits. In later years when increases in individuals' EEA and NRA occur, the OASI Trust Fund would transfer the benefit reductions to the General Fund of the Treasury. The estimated long-range effect on the OASI and DI Trust Funds is negligible. The Aug. 31, 2018, letter at *https://www.ssa.gov/OACT/solvency/MRubio_20180801.pdf* provides more details on this proposal.

- Senators Mike Lee and Joni Ernst released a discussion draft of the Child Rearing and Development Leave Empowerment Act, or CRADLE Act, on March 13, 2019. This proposal is very similar to S. 3345 but with slightly different standards to become a qualifying parent. Under this proposal, parental leave benefits would be available for births and adoptions in calendar years 2021 through 2025. Qualifying parents must take leave from work to receive the parental leave benefit. Parents may elect to receive parental leave benefits for up to three months, and their EEA and NRA for a future retired worker benefit would then be increased by two months for every month of parental leave benefit taken. The General Fund of the Treasury would reimburse the OASI Trust Fund for the net cost of the parental leave benefits. In later years when increases in individuals' EEA and NRA occur, the OASI Trust Fund would transfer the benefit reductions to the General Fund of the Treasury. The estimated long-range effect on the OASI and DI Trust Funds is negligible. The March 14, 2019, letter at *https://www.ssa.gov/OACT/solvency/LeeErnst_20190314.pdf* provides more details on this proposal.

- Senator Marco Rubio and Representative Ann Wagner introduced S. 920 and H.R. 1940, the New Parents Act of 2019, on March 27, 2019. Under this proposal, parental leave benefits would be available beginning in 2022 and continuing through each year for which OASI Trust Fund reserves as a percentage of projected program cost that are at least 20 percent for that year and for the following year. The parental leave is estimated to be available through 2032, according to the OCACT estimate. Parents must attest that they intend to use the benefit to finance spending more time with their child and not be working during the benefit period. Those who elect to receive parental leave benefits would repay that benefit by choosing either (1) a two-month increase in EEA/NRA for their future retired worker benefit or (2) a 4.5 percentage point reduction in their future benefit for each month of parental leave taken, for the first 60 months of benefit receipt. There are no transfers to or from the General Fund of the Treasury for this proposal. Because the proposal is designed to fully pay for the cost of the parental leave benefit on a present value basis, the estimated long-range effect on the OASI and DI Trust Funds is negligible. The April 9, 2019, letter from the Chief Actuary at *https://www.ssa.gov/OACT/solvency/RubioWagner_20190409.pdf* provides more details on this proposal.

For a full list of proposal estimates by the Office of the Chief Actuary and links to estimates and detailed information for specific proposals, see *https://www.ssa.gov/OACT/solvency/index.html*. A comprehensive list of individual provisions from comprehensive solvency proposals appears at *https://www.ssa.gov/OACT/solvency/provisions/index.html*. ■

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ENDNOTES

1 The OASI and DI Trust Funds are distinct legal entities that operate independently. To illustrate the actuarial status of the program as a whole, the fund operations are often combined on a hypothetical basis. The program as a whole is referred to as OASDI.

2 A weighted sum of taxable wages and taxable self-employment income.

3 The average indexed monthly earnings equals the average monthly earnings of the highest 35 earnings years, indexed by changes in economy-wide average earnings levels from the specific earnings year, if before age 60, to age 60 for retired workers. For disabled workers, the number of earnings year used may be less than 35, depending on the age at disability.

4 The EEA is the first age at which individuals can become entitled to aged widow(er), aged spouse and retired worker benefits. The EEA is 60 years for aged widow(er)s and 62 years for aged spouses and retired workers. The NRA is the age at which the basic Social Security benefit, the primary insurance amount (PIA), is paid for these same three benefit categories. Individuals first claiming a benefit before NRA receive a permanent percentage reduction in their benefit relative to their PIA, based on the age at claiming. Retired workers first claiming a benefit after NRA receive a permanent percentage benefit increase relative to the PIA.

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Social Security Changes for 2020

By Bruce D. Schobel

Every October, the U.S. Social Security Administration (SSA) announces certain changes in program amounts that occur **automatically**—that is, without any new legislation being necessary. The most widely publicized of these changes is the annual cost-of-living adjustment (COLA) affecting monthly Social Security benefits. Other automatic changes are important to people of working age as well as to beneficiaries. On Oct. 10, 2019, the government announced the Social Security COLA effective for December 2019 and the other increases effective for 2020.

BENEFIT INCREASE

Since 1984, Social Security's COLAs have been based on the third-quarter-to-third-quarter increase, if any, in the average Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). The CPI-W, which is computed by the U.S. Labor Department's Bureau of Labor Statistics, rose 1.6 percent (rounded to the nearest 0.1 percent) year-to-year from the third quarter of 2018 through the third quarter of 2019. Accordingly, all Social Security benefits, in current-payment status or not, rise by the same percentage, effective December 2019. The December 2019 COLA is smaller than the 2.8 percent increase effective for December 2018. As usual, December benefits are paid in the following January; all monthly Social Security benefits are paid in arrears, after the month is over.

WAGE-INDEXED PARAMETERS

A long list of updated Social Security program parameters, some of which are rather obscure, is ordinarily announced simultaneously with the COLA each year. Unlike the COLA, changes in these parameters are based on changes in the national average wage, which the Social Security Administration computes from

all W-2 forms filed by employers each year. Interestingly, workers who are self-employed, but not **also** employed by someone else, are excluded entirely from the average-wage computation. Workers who are both self-employed and employed during the year have only their earnings from employment included in the calculation of the national average wage, leading to some minor distortion in the resulting percentage change. The national average wage rose from $50,321.89 in 2017 to $52,145.80 in 2018. That 2018 value, which is used in SSA's calculations of wage-indexed parameters for 2020, is the most recent national average wage figure available right now. At the time of the October 2019 announcement, 2019 wasn't over, so obviously the 2019 national average wage could not be known yet. It will be calculable later in 2020, after employers file all 2019 W-2 forms with SSA. That takes several months, including correction of errors.

Interestingly, certain wage-indexed program amounts are permitted by law to increase (or even decrease) with or without a COLA occurring.

MAXIMUM TAXABLE AMOUNT AND TAX RATES

One very important change that affects high-income workers (employees and the self-employed) is the increase in the maximum amount of earnings subject to Social Security payroll taxes (FICA and SECA) during the year and creditable for benefit-computation purposes. This program parameter can rise (it cannot fall) in any year following the effective date of a COLA. In a few recent years when no COLA was effective, due to the CPI-W declining, the maximum taxable amount did not rise in the following year. Because a COLA is effective for December 2019, the maximum taxable amount rose from $132,900 for 2019 to $137,700 for 2020, based on the change in the national average wage.

Social Security tax rates are not automatically adjusted but are set by law. The FICA tax rate, payable by employees and employers, each, has been 6.2 percent since 1990. The self-employed pay both halves of this tax and get to deduct, for income-tax purposes, the half representing the employer share. Employees cannot deduct Social Security taxes from their taxable incomes, but employers can.

RETIREMENT EARNINGS TEST

Another wage-indexed Social Security program parameter is the exempt amount under the retirement earnings test for beneficiaries who have not yet reached their normal retirement age, or NRA. (Social Security's NRA was 65 for workers born before 1938 and is rising gradually under present law to 67 for workers born after 1959.) The annual exempt amount for beneficiaries who will not reach their NRA during the current calendar year rose from $17,640 for 2019 to $18,240 for 2020. For beneficiaries who reached their NRA in 2019, the exempt amount was $46,920 for earnings in the months prior to reaching NRA. That exempt amount rose to $48,600 for 2020. Since January 2000, workers who have reached their Social Security NRA can earn unlimited amounts without causing any reduction in their Social Security benefits, starting with the month in which they reach that age. Moreover, any additional covered earnings are reflected in annual benefit recomputations and can cause monthly benefits to rise (they cannot decline for this reason), effective each January after the previous year is over.

COVERAGE CREDITS

Interestingly, certain wage-indexed program amounts are permitted by law to increase (or even decrease) with or without a COLA occurring. The amount of earnings needed to receive one coverage credit was $1,360 in 2019 and rose to $1,410 in 2020. Workers who earn at least $5,640 in Social Security-covered employment (or self-employment) during 2020 will receive the maximum four coverage credits for the year. Workers need 40 coverage credits to be eligible for retired-worker benefits at age 62 or older. (These coverage credits used to be known as "quarters of coverage"; since 1978, they have been granted based on **annual** earnings, making the old name somewhat inappropriate.)

BENEFIT FORMULAS

The so-called "bend-points" of the formulas used to compute primary insurance amounts (PIAs) and maximum family benefits (MFBs) are also wage-indexed and can move up or down with or without a COLA occurring. The two PIA bend-points for workers first becoming eligible for benefits in 2020 (that is, born in 1958 with respect to retired-worker benefits) are $960 and $5,785. The three MFB bend-points for 2020 eligibilities are $1,226, $1,770 and $2,309.

The complete list of wage-indexed program parameters for 2020 and corresponding values for previous years are available at *www.ssa.gov/oact*. ■

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