Retirement Replacement Rates: What and How

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August 2015

PRC WP2015-20
Pension Research Council Working Paper
Pension Research Council
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Abstract

Replacement rates compare retirement income to pre-retirement earnings. They are used both by financing advisors in advising households on how much to save for retirement, and by policymakers who wish to assess the adequacy of retirement saving in the population. But in recent years, there has been renewed discussion of how replacement rates should be calculated. I discuss three topics in this current debate. First, should policymakers be presented with replacement rates based upon stylized workers or using administrative or microsimulation data? Second, should the denominator of the replacement rate calculation—pre-retirement earnings—be adjusted for the growth of prices or the growth of economy-wide wages? And third, should replacement rates incorporate a family-size adjustment to account for how having children affects parents' need to save for retirement? I illustrate the effects of these methodological choices using a microsimulation model of Social Security benefits and employer-sponsored pensions. The results suggest that much of the disagreement over whether Americans face a 'retirement challenge' or a 'retirement crisis' stems not from differing estimates of how much income American retirees will have, but of how much income they will need to maintain their pre-retirement standards of living.

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Retirement Replacement Rates: What and How

Replacement rates are a common measure of retirement income adequacy used by households to gauge their own saving for retirement, and by policymakers to assess the effectiveness of government and private pensions in providing income for the retired population. Replacement rates represent retirement income as a percentage of pre-retirement earnings and thus assess households' ability to maintain their pre-retirement levels of consumption once they have ceased working. A replacement rate of 100 percent is not necessary, as retirees face lower taxes and work-related costs, and they often have paid off their mortgages and completed their saving for retirement. Nevertheless, the ratio provides an intuitive yardstick for retirement income adequacy.

While seemingly simple, replacement rates can be measured in different ways based on different concepts of retirement income adequacy. These differences have important implications for our assessment of Americans' retirement saving. Discussion of the methodology of replacement rates was ignited when, in 2014, the Social Security Trustees opted to remove from their annual report tables that represented Social Security replacement rates for stylized workers with different levels of lifetime earnings (Social Security Trustees 2014). Previously, replacement rate data in earlier annual Trustees reports had informed how many policymakers thought about retirement policy. Yet the Social Security Trustees warned in 2013 that replacement rates figures in their report produced 'percentages that may differ significantly from those that would be produced by comparing benefits to these representative workers' recent average earnings levels or to other, more common measures of pre-retirement income' (2013: 143) Those figures were deleted entirely in 2014, and it is not clear when and in what form they might reappear.

This chapter discusses three topics pertaining to replacement rates calculations. First, I ask whether policymakers should continue to rely upon stylized hypothetical earnings patterns in illustrating replacement rates, or whether they should turn to administrative data and microsimulation models whose out is, while more complex, capable of producing a more realistic and nuanced view of retirement income adequacy. Second, I address the question of how pre-retirement earnings should be represented in the replacement rate calculation. Most analysts agree that career-average earnings are a better measure of the pre-retirement standard of living than earnings in a single year immediately prior to retirement. Yet there is disagreement on whether pre-retirement earnings should be adjusted for growth in the cost of living or for growth in national average wages. This disagreement is based upon conceptual differences in how analysts view the purpose of retirement saving. Third, I examine the question of how children affect parents' need to save for retirement. Adjustments for differences in family size and composition have a significant impact upon measured retirement income adequacy. Indeed, several prominent studies that find undersaving for retirement to be a modest problem utilize family-size adjustments, while studies concluding that retirement undersaving is a much larger problem fail to adjust for the presence of children.

Finally, I illustrate the effects of different methods of calculating replacement rates using a microsimulation model of Social Security and employer-sponsored pensions. The Policy Simulation Group models are used to project Social Security benefits and pension incomes for members of the 1940 birth cohort.

While replacement rates are a seemingly simple concept, analysts face a range of choices regarding the type of pre-retirement earnings to be illustrated, how those earnings should be adjusted for changes in the cost or the standard of living, and how household size and composition should be accounted for in replacement rate calculations. There are many plausible combinations of such choices, such that a given level of retirement income could be characterized as wholly inadequate to overgenerous, depending upon the way in which the replacement rate is structured. How replacement rates are defined and calculated is crucial for assessing Americans' preparedness for retirement. In other words, the question on Americans' retirement security is not simply 'How much income will retirees have?' but 'How much is enough?' It would be impossible to review here every possible combination of choices for calculating replacement rates. In what follows, however, I review the focal points of current policy discussions and illustrate the range of possible outcomes.

The Use of Stylized Earners versus Microsimulation

Probably the best-known replacement rate figures are published by the US Social Security Administration, which administers the Old Age and Survivors Insurance program that is commonly referred to as 'Social Security.' The SSA is the source of the well-known statistic that for an average earner, Social Security retirement benefits will replace only about 40 percent; moreover, SSA states that, according to most financial advisors, retirees need 70 percent of their pre-retirement earnings to sustain their pre-retirement standard of living (SSA 2014). This leads to the conclusion that Social Security benefits provide roughly 40/70ths, or 57 percent, of what a typical individual requires to maintain his standard of living in retirement.[1]

The SSA's replacement rates figure for its 'medium earner', along with those for 'low' and 'high' earners, are calculated using stylized earnings patterns rather than directly from administrative data. The evolution of these stylized earnings patterns is worth analyzing. The SSA initially illustrated replacement rates using so-called 'steady earners,' who in each year of their working lives were assumed to earn a stated percentage of the Average Wage Index (AWI). For instance, the medium steady earner always earned 100 percent of the AWI, the low earner 45 percent, and the high earner 160 percent. Replacement rates were calculated by comparing benefits at the normal retirement age (then 65) to nominal earnings in the year prior to retirement.

Over time, however, it because clear that these steady earnings patterns failed to match the inverted U-shaped age-earnings profile typical of actual workers. As Munnell and Soto put it, these steady earnings patterns 'bore little relation to reality' (2005: 8). In response to such concerns, SSA introduced in 2011 its so-called 'scaled earners' with more representative earnings patterns. The broad age-earnings profiles were derived from administrative data, but the level of annual earnings was calibrated such that, in combination with a change in calculation methods, replacement rates for the hypothetical scaled earners would equal those calculated using the prior steady earners. Thus, while the new scaled earnings patterns are more realistic than the previous SSA steady earners, the methodology was structured to maintain the results calculated under the previous steady earner approach.[2]

The new SSA scaled earners are used to illustrate benefits payable under current law, such as in the annual Trustees Report, as well as in reform proposals that would change the benefits to which retirees become entitled. One problem with these improved scaled earners is that they are still not particularly representative of the typical earner. For instance, scaled earners are assumed to work every year from age 21 to age 65, when most real-world individuals take at least some time away from the workforce and tend to claim benefits before the Full Retirement Age of 66. Individuals at risk of poverty in retirement are most likely to have had a short working life than a long working life at low wages as per SSA's scaled low earner. Likewise, even the scaled medium earner has annual earnings that are substantially higher than those of a typical individual in the workforce (Mitchell and Phillips 2006).

A second problem is that these stylized earners are most informative for illustrating benefits for never-married workers, whereas most Social Security participants are married, divorced, or widowed. This is important because households tend to make saving and consumption decisions as a unit, and also because a significant portion of Social Security benefits is paid to spouses and widows. Roughly 23 percent of female retirees in 2012 received a benefit that was in part or whole based upon their spouse's earnings record (SSA 2013). If marital benefits are not accounted for, the effects of Social Security's auxiliary benefits are understated.

It is not that replacement rates have never been calculated using real-world data. Both Nichols (1977) and Grad (1990) used Social Security administrative data to calculate benefit replacement rates for retirees. Yet the use of administrative and microsimulation data has become increasingly common in recent years. The SSA Office of Disability and Retirement Policy utilizes a microsimulation model known as MINT (Modeling Income in the Near Term) as its principal tool for benefit analysis. The Congressional Budget Office uses the CBOLT (CBO Long-Term) model, and the Government Accountability Office uses the PSG models that are used in this paper. More recently, SSA's Office of the Chief Actuary has published replacement rate figures based upon administrative data. Analysts outside the government can now utilize public use earnings and benefits data made available by SSA.

The better data allow for a much more realistic view of individual workers, capturing differences in years in the workforce, age-earnings profiles, age of retirement, and other factors that affect Social Security benefits and retirement income. Moreover, microsimulation data allow analysis of households, calculating the interactions of peoples' earnings in determining Social

Security benefits. This approach provides a much more accurate representation of the replacement rates payable to female retirees, who are the main recipients of Social Security auxiliary benefits.

The ability to group individuals into households is extremely important in overcoming some of the limitations of replacement rates as a measure of retirement income adequacy. For instance, a spouse who stays home to care for the couple's children may receive an extremely high (or even infinite) replacement rate relative to her own earnings, but her earnings are not representative of the standard of living she enjoyed prior to retirement. Combining spouses into a single household unit that shares earnings and benefits equally provides a better picture of the role Social Security plays in the household's retirement preparation. A similar point can be made when pensions and other retirement saving enter the picture.

There seems little reason for policymakers or analysts to continue to rely principally upon stylized workers when administrative data or microsimulation models are increasingly available, particularly as the latter provide a more detailed and nuanced view of Social Security and retirement income than previously available. They also allow potential Social Security reforms to more accurately target individuals who, due to having earnings patterns or other characteristics not typical of a stylized full-career earning, may not be well-served by the current benefit formula.

How Should Prior Earnings Be Expressed?

A replacement rate expresses retirement income as a percentage of pre-retirement earnings. There is a debate over how the denominator of the calculation—pre-retirement earnings—should be measured.

Traditionally, replacement rates have expressed retirement income as a percentage of workers' pre-retirement earnings. This was how the SSA calculated replacement rates for its stylized ‘steady earners.’ Moreover, traditional defined benefit (DB) pension plans still continue to calculate replacement rates in such a way, since benefits under such plans are calculated relative to some measure of final earnings.

Yet many policy analysts argue today that replacement rates are better calculated relative to a longer-term average of pre-retirement earnings. Earnings in a single year can fluctuate significantly and hence may not be representative of the standard of living that pre-retirement earnings provided over the longer term.

Due in part to the Social Security Trustees removing replacement rates from their annual report, there has recently been significant discussion of how career-average pre-retirement earnings should be represented. SSA calculates replacement rates by comparing Social Security benefits in the first year of retirement to the average of the highest 35 years of pre-retirement earnings, indexed for the growth of average economy wide wages. This so-called ‘wage indexing’ increases past nominal earnings by the ratio of SSAs’ Average Wage Index (AWI) in the year the individual turned age 64 to the AWI in the year the earnings took place.

Since the AWI generally rises about one percentage point faster than the Consumer Price Index, this process will produce higher measured pre-retirement earnings, and lower replacement rates of pre-retirement earnings, than a replacement rate calculation that utilizes nominal or inflation-indexed earnings. The wage-indexed average of lifetime earnings is generally about one-fifth higher than inflation-indexed earnings, leading to a proportional reduction in measured replacement rates. In its National Retirement Risk Index (NRRI), the Center for Retirement Research applies a replacement rate calculation very similar to SSA OACT’s to overall retirement income, concluding that a majority of working-age Americans are ‘at risk’ of falling below target levels of retirement income.[3]

The theory underlying 'wage-indexed replacement rates' is that retired households want their standard of living to increase in step with the standard of living of active workers. Literally speaking, the replacement rate for SSA's stylized 'scaled medium earner' is equal to the benefit received by this earner in retirement divided by the AWI at the time he retirees.[4] That is, wage-indexed replacement rates effectively compare income for retirees to the earnings of contemporaneous workers.

Munnell, one of the co-authors of the CRR's NRRI, states that 'When constructing the NRRI targets, my colleagues and I made a conscious decision to assume that households had a preference for a standard of living that increased during their working lives at the rate of economy-wide wage growth. This assumption reflected our belief that households care not only about their absolute standard of living, but also about their relative standard of living' (2014). One can think of this as a 'keeping up with the Joneses,' relative-income approach reminiscent of Duesenberry (1949) or, more recently, Frank (2005).

Nevertheless, a number of commentators have expressed concern that indexing pre-retirement earnings for economy-wide wage growth, rather than merely for the growth of prices, overstates what households consider to be an adequate retirement income. Steuerle et al. observe that 'many retirees may be satisfied just to maintain their ability to purchase: They want the same purchasing power they've had all along. If this is the case, replacement rates could be derived from individual wages adjusted for inflation instead of wage growth. Since prices usually rise more slowly than wages, this would result in lower past wages and higher replacement rates' (2000: 1–2). Or, as the Congressional Budget Office recently stated, 'Indexing earnings to prices better captures the real amount of resources available to a worker over his or her lifetime, whereas indexing earnings to wages may overstate those amounts' (2014: 16).[5]

Thus, a more plausible approach may be to compare retirees' Social Security benefits or total retirement incomes to the purchasing power of their pre-retirement earnings. This approach is more reminiscent of a simplified life-cycle model in which individuals seek to consume more or less the same amount from year to year. For instance, the financial planning program 'ESPlanner,' which applies the life-cycle model to retirement planning, seeks to calculate the highest level of steady, inflation-adjusted consumption that an individual or household can maintain over its lifetime.[6] A replacement rate calculated relative to inflation-adjusted pre-retirement earnings is a simple approximation of such an approach.[7]

The differences between these two measures can be substantial. For instance, the Congressional Budget Office (2014) recently projected that Social Security will provide the average retiree born in the 1960s with a wage-indexed replacement rate of 46 percent, versus a price-indexed replacement rate of 58 percent.[8]

Neither price-indexed nor wage-indexed replacement rates fully capture all the factors that affect saving and consumption such as time preferences, precautionary saving, borrowing constraints, and uncertainty regarding future earnings. But this should not be a disqualification, given replacement rates' role as a simplified rule-of-thumb that is accessible to savers and policymakers lacking specialized knowledge. At a minimum, offering replacement rates calculated using both inflation-indexed and wage-indexed pre-retirement earnings, as in CBO (2014), makes readers more aware of the importance of these definitional choices.

Adjusting Replacement Rates for Household Size and Composition

Another area of disagreement pertains to how measures of retirement income adequacy should account for the effects of children on their parents' need to save for retirement. The justification for such an adjustment is that households with children need not save as much for retirement as households without children, because part of parents' income during their working years is consumed by their children. Skinner describes the logic in humorous terms:

> Parents are already used to getting by on peanut butter, given that a large fraction of their pre-retirement budget has been devoted to supporting children, so it's not difficult to set aside enough money to keep them in peanut butter through retirement. By contrast, childless households with the same income accustomed to caviar and fine wine must set aside more assets to maintain themselves in the style to which they have become accustomed (2007: 69).

In this context, the costs of raising children are akin to the costs of paying off a mortgage or saving for retirement: they represent foregone consumption during the household's working years that need not be replaced once the household has retired. Put simply, parents do not need to replace consumption they never had. Notably, studies that find higher levels of retirement saving adequacy, such as Gale et al. (2009) and Hurd and Rohwedder (2011, 2014), use a family size adjustment. By contrast, the Center for Retirement Research's NRRI adjusts target replacement rates for single individuals versus couples, but it makes no adjustment for whether retirees had children. The NRRI's designers argue that, once children leave home, parents 'take over' their children's share of household consumption and wish to maintain this higher standard of living through retirement.

This remains an open area for research. Some research focuses on household wealth accumulation. For instance, Engen et al. (1999) find that households with high saving rates and above-average wealth tend to have fewer children than low-saving households. Likewise, Scholz and Seshadri (2007) show that households with children hold less average wealth than similar households that did not have children. From these results, Scholz and Seshadri conclude that parents tend to save to replace their own pre-retirement consumption, implying that analysis of retirement saving adequacy should account for household size. Another research path focuses on how household saving patterns change when children leave the home. If children depress household saving, then one might expect saving to increase once children have left the nest. There are a number of reasons why such a change may not be apparent. For instance, inertia may cause households to leave contribution rates to employer-sponsored pension plans unchanged even after children leave, at least delaying changes to saving rates. Likewise, college tuition or loan payments for children may continue even after children have technically left home, making measurement of saving changes more difficult. Also, parents may wish to enjoy a temporary splurge in spending after children have left home.

Coe and Webb (2010) follow households in several waves of the Health and Retirement Study, concluding that parents do not appear to reduce their consumption once children leave home. However, that study has been criticized for relying upon a sample of only 36 households whose parents were unusually old at the time their children left home. Klos and Rottke use a larger German dataset to analyze how parents respond to children leaving home. They find that ‘household consumption drops and saving rises significantly within four years after a child moves out of a household’ (2013: ii). However, for college-educated parents, who are more likely to have children attending college and thus continuing college-related costs, the transition to higher saving takes longer than four years. Klos and Rottke conclude that ‘Assuming that household consumption remains constant after a child’s move-out would overstate the problem of inadequate saving’ (2013: 20).

Analysts taking an alternate approach rely on subjective assessments of retirement income adequacy. As noted above, households with children appear to have lower average wealth than childless households. This result implies either that parents save to replace their own pre-retirement consumption rather than the household's total consumption, or that households with children undersave for retirement compared to similar childless households. If the latter, then having children can be seen as detrimental to parents' retirement planning. In the latter case one would expect that retirees who had children would express greater reservations than non-parents about their income security and quality of life. Rohwedder (2006) used Health and Retirement Study data to analyze respondents' answers to questions including, 'All in all, would you say that your retirement has turned out to be very satisfying, moderately satisfying, or not at all satisfying?'; 'Would you say the retirement years have been better, about the same, or not as good?'; and 'Please tell me if you worry a lot, somewhat, a little, or not at all [about] not having enough income to get by.' She found no significant difference in how retired parents answered these questions versus similar non-parents, buttressing the notion that having children affects parents' retirement saving in predictable and rational ways.

To illustrate the effects of adjusting replacement rates for household size and composition, the following sections will use the framework established in Citro and Michael (1995) to calculate the number of 'adult equivalents' living in a household. It takes the form

$$\text{Adult equivalents} = (A + PK)^F$$

where A is the number of adults in the family, K is the number of children, P is the cost of a child relative to an adult, and F is a factor reflecting economies of scale in household size. Following common usage, I assume a value 0.7 for both P and F. Lower values of P will result in relatively lower costs of living for a child versus an adult household member, while lower values of F will result in larger economies of scale as household size increases. I assume that children are counted as part of households until age 21.

In any given year, an individual's earnings are taken to equal total household earnings divided by the number of adult equivalents in the household. Career-average earnings are based on the annual family-size adjusted earnings. Thus, this process accounts for earnings when the respondent is single, married, divorced, or remarried; and when childless, when children are living at home, and when children have left home. Similarly, the respondent's total household Social Security or other retirement income is divided by the number of adult equivalents at the time the replacement rate is calculated. For the small number of retiree households who have children living at home, the family-adjustment is applied to Social Security and pension benefits.

Illustrating Social Security Replacement Rates

We develop replacement rates using a suite of microsimulation models developed by the Policy Simulation Group (PSF).[9] These models simulate the US population's participation in the Social Security program and employer-sponsored DB and defined contribution (DC) pension plans. Used by the Social Security Administration, the Department of Labor and the Government Accountability Office, these models are calibrated to reproduce both system-level and distributional outcomes similar to those generated by Social Security's Board of Trustees and the Social Security Administration's Office of the Chief Actuary.

The denominators used in the replacement rate calculations are based upon the present value of individual or household earnings from ages 21 through 65, calculated using the historical or projected yield on the Social Security Trust Funds. This present value is converted to a steady earnings path that increases annually either with the AWI or the Consumer Price Index (CPI).

These figures are qualitatively similar to the indexed average of pre-retirement earnings used in other studies, but they are designed to include earnings-years and to be consistent with the present value of lifetime earnings.[10]

I illustrate the results using individuals born in 1940 who survive to age 70. Age 70 is chosen because practically all eligible individuals will have claimed Social Security benefits by then.[11] Social Security replacement rates equal the individual’s total scheduled Social Security benefit including any auxiliary supplement, as a percentage of the average of the individual's own highest 35 years of earnings. A couple’s replacement rate equals the couple’s total Social Security benefit divided by the couple’s average pre-retirement earnings. Combined replacement rates include Social Security benefits, DB pensions payments, and the value of employer-sponsored DC pensions expressed as an inflation-indexed annuity payment. Retirement saving outside of employer-sponsored plans is not included in these calculations, nor is the value of home equity.

The median individual Social Security replacement rate measured relative to AWI-indexed earnings is 60 percent. This is substantially higher than the 40 percent commonly discussed. As mentioned earlier, the SSA states that an average earner will receive a benefit replacement rate of 40 percent. Likewise Goss et al. (2014) present replacement rates for individuals claiming benefits in the year 2011, finding a median replacement rate relative to wage-indexed average earnings of 39 percent. The difference between my results and those of the SSA and Goss et al. arises due to differences in how replacement rates are calculated, as well as in the beneficiaries and the benefits that are included in the replacement rate calculation.

The denominator used in my figures is the wage-indexed average of all earnings between the ages of 21 and 62, whereas SSA’s figures use the individual’s highest 35 years of earnings. Lifetime earnings used here are therefore lower than SSA’s calculations, and so this produces higher measured replacement rates. Yet it also provides a better measure of how individuals with different total lifetime earnings are treated by the Social Security program.

In addition, the calculation here for the 1940 birth cohort includes all Social Security beneficiaries who survive to age 70, including those who collect only an auxiliary (spousal or widow benefit). Goss et al. (2014), by contrast, include only those who are eligible for benefits based upon their own earnings records. Likewise, for individuals eligible for benefits based upon their own earnings, the calculations here include all benefits they receive, including spousal or widow benefits. Goss et al. (2014) measure only the benefits received based upon the beneficiary's own earnings. This approach significantly understates total benefits for those retirees, generally women, who receive a spousal or widow supplement. Approximately one-fifth of all retirees in 2012 received an auxiliary benefit, and for such retirees, the auxiliary payment increased their total benefit by 78 percent. (Biggs et al. 2015).

The individual Social Security replacement rates presented here are a more complete picture of the Social Security beneficiary population and the Social Security benefits they receive, nevertheless these are difficult to interpret. For instance, what does it *mean* for retirement preparedness if a spouse who worked little outside the home receives a high benefit relative to her own earnings, when her standard of living prior to retirement depended on her spouse's earnings? We believe this justifies calculating replacement rates on a household basis. By doing so, we avoid interpretive problems while still including the full Social Security beneficiary population and all the benefits they receive.

When we calculate wage-indexed Social Security replacement rates on a household basis, the median value for the 1940 birth cohort falls from 60 to 54 percent. Perhaps more important, the number of very low and very high replacement rates is reduced. For instance, at the couple level, 10 percent of beneficiaries receive a replacement rate above 100 percent; at the individual level, the top 10 percent of beneficiaries receives replacement rates higher than 165 percent.

Nevertheless these figures are calculated relative to AWI-indexed earnings, which effectively compares their benefits not to their *own* pre-retirement earnings, but to the earnings of active workers. A CPI-indexed denominator in the replacement rate calculation provides a better picture of how households' Social Security or pension benefits compared to the purchasing power of their own average pre-retirement earnings. The median individual replacement rate relative to CPI-indexed pre-retirement earnings for the 1940 birth cohort is 72 percent, versus 60 percent of wage-indexed earnings. The median couple replacement rate is 65 percent, versus 54 percent for couples relative to wage-indexed earnings.

Next we consider how an adjustment for family size and composition alters replacement rates. The family size adjustment increases the median household Social Security replacement rate for the 1940 birth cohort from 65 to 82 percent of inflation-indexed average pre-retirement earnings. Not surprisingly, the family size adjustments are smallest for those who were never married, where median replacement rates rose only from 67 to 68 percent. These individuals' replacement rates can be affected by accounting for children. For married individuals, the effect of the family size adjustment is much larger, raising median replacement rates from 61 to 82 percent. The difference is more modest but still important for divorced individuals, where median replacement rates rise from 64 to 75 percent. For widows and widowers, the effect depends importantly upon gender: widowers see increased replacement rates through a family size adjustment, as their share of household pre-retirement earnings is generally lower than their own pre-retirement earnings. Replacement rates for widowers rise from 78 to 87 percent when family-size adjusted. For widows, however, the opposite is true: median replacement rates decline from 88 to 81 percent, reflecting the loss of economies of scale when living alone versus as a couple.

The PSG models also simulate benefits from employer-sponsored retirement plans, allowing for the calculation of replacement rates covering a greater share of total retirement income. The PSG models also simulate pension rollovers to Individual Retirement Accounts, but they do not model IRAs or other individual retirement saving that is funded independently of rollovers. The approach assumes that DC pension accounts earn a return equal to the yield on the Social Security Trust Funds. At retirement, households are assumed to convert DC pension accounts to an inflation-adjusted annuity.

Nevertheless, the PSG models do not simulate the full range of retirement income sources including housing equity, income from non-retirement assets, and government transfer programs other than Social Security. For the 1940 birth cohort, combined Social Security, DB, and DC pension income amounts to about two-thirds of retired households' total non-earnings income, implying that total retirement income would be higher than the combined Social Security and employer-sponsored pension benefits simulated here.[12]

When we include income from employer-sponsored pensions along with Social Security benefits, combined family-size adjusted replacement rates relative to CPI-indexed pre-retirement earnings rise to 126 percent at the median. Seventy-five percent of households have replacement rates above 85 percent of career earnings, and 90 percent of households have replacement rates above 50 percent. As a result, it appears that most households at age 70 would have a higher standard of living—after accounting for economies of scale in living costs, household income consumed by children, and work-related costs—than their *average* during their pre-retirement years.

By contrast, if replacement rates are calculated relative to wage-indexed earnings without a family-size adjustment, 43 percent of the 1940 cohort fall short of a combined Social Security and pension replacement rate of 75 percent. Thus, much of the difference of opinion regarding whether Americans face a retirement 'challenge' or a retirement 'crisis' is attributable to differing definitions of income adequacy, rather than projections of what Americans' actual retirement incomes will be in dollars and cents.

Conclusion

Replacement rates are a commonly-used measure of retirement income adequacy by individuals, financial advisors, and policymakers, but until recently little attention was paid to *how* replacement rates are calculated. Replacement rates began with simple calculations that compared retirement income to retirees' earnings immediately preceding retirement, using stylized workers with unrealistic earnings patterns and ignoring the interaction of spouses' earnings and savings. More recently however, methods have improved through access to administrative data and microsimulation models, and replacement rate calculations have been applied to career-long average earnings rather than earnings in a single year preceding retirement.

Even so, there remain key conceptual disagreements about how to index pre-retirement earnings in a replacement rate calculation. Price-indexed replacement rates measure a household's ability to replace its own average pre-retirement consumption, while wage-indexed replacement rates effectively compares the incomes of retirees to those of working age-households. To the degree that retired households wish to maintain their own prior levels of consumption rather than chase contemporary workers' living standards, replacement rates calculated relative to inflation-adjusted earnings may be a better shorthand measure of retirement income adequacy.

This is also disagreement about how replacement rates should consider the effects of children on retirement saving needs. Research in this area is continuing, but households with children do save less for retirement than similar households without children. Despite this, they seem not to suffer in terms of subjective assessments of retirement income adequacy. Thus an adjustment for family size and composition seems a reasonable way to analyze households with and without children in a more comparable way.

Applying these different methods of calculating replacement rates to simulated populations shows how important the definitional issues are. Many models are used to project the earnings, Social Security benefits, and pension income of future cohorts of US retirees. Nevertheless, differences in how retirement income adequacy is conceived of, defined, and measured, appear to have greater impacts on perceptions of retirement preparedness than do differences in the dollar values that different models project. For this reason, it is extremely important that analysts and policymakers step back and ask what households are trying to do when they save for retirement. Are they trying to maintain their own personal pre-retirement consumption, or are they trying to match the amount that they and their children consumed together? Likewise, are they concerned with matching their pre-retirement consumption, or are they more concerned with 'keeping up with the Joneses,' in the form of maintaining a standard of living in retirement that matches that of contemporaneous workers? These conceptual questions are as important in gauging retirement income adequacy as are the more technical issues of projecting Americans' future earnings, Social Security benefits, and pension incomes. While government agencies such as the Social Security Administration, the Congressional Budget Office, the Department of Labor, and others have expended significant resources in projecting how much income future retirees will have, the most fruitful step going forward may be to focus research attention more closely on how much income future retirees will need.

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Endnotes

[1] This discussion draws on Biggs et al. (2015).

[2] In addition to calibrating the scaled earnings patterns, SSA OACT adjusted its approach for calculating replacement rates. Under the steady earner methodology, replacement rates expressed Social Security benefits to earnings in the year immediately prior to benefit claiming. Once the scaled earner approach was adopted, replacement rates were calculated by comparing Social Security benefits to the average of the highest 35 years of pre-retirement earnings, where earnings were adjusted through age 64 to the growth of overall earnings in the economy. This new method of calculation replacement rates, along with the calibration of pre-retirement earnings levels, allowed SSA OACT to maintain the same measured replacement rates for the low, medium and high-earning scaled workers as were produced using the previous steady earners.

[3] See Munnell et al. (2006).

[4] This can be demonstrated using data from Table V.C7 of the 2014 Trustees Report, which includes annual benefit amounts for the hypothetical scaled earners retiring in a given year along with the annual wages paid to workers in that year. The stylized medium earner retiring in 2014 receives an annual benefit of $19,477, which is equal to 41.6 percent of the $46,787 Average Wage Index in 2014. Clingman and Nichols (2004) calculate a wage-indexed replacement rate for a medium-scaled relative to wage-indexed career average earnings of 41.1 percent, indicating that the medium-scaled earner’s average prior earnings are almost precisely equal to the AWI in the year he retires.

[5] Also see MacDonald and Moore (2011).

[6] For instance, see Bernheim, et al. (2000) and www.ESPlanner.com.

[7] Calculating replacement rates relative to some truncated measure of the individual's pre-retirement earnings might be taken to account for borrowing constraints early in life. For instance, it is common to calculate replacement rates relative to the highest 35 years of earnings, though the full working life from age 21 through Social Security's normal retirement age now covers 45 years.

[8] These figures, and others produced here, assume that scheduled Social Security benefits will continue to be paid. Under current projections the combined Social Security trust funds will become exhausted around the year 2030. Under current law, at that point benefits would be reduced across the board by approximately 25 percent. No observers expect such an outcome, but these issues illustrate that future Social Security benefit levels are uncertain.

[9] Background on the models is available in Holmer et al. (2015). See www.polsim.com.

[10] This method of calculating the denominator of the replacement rate calculation has relatively little distributional impact in any given year. However, changes in interest rates can alter average replacement rates over time as the present value of pre-retirement earnings changes.

[11] Measured replacement rates at age 70 will be altered somewhat by mortality between ages 62 and 70, which may disproportionately reduce the number of low-earning retirees with above-average replacement rates while increasing the number of widows, who also tend to have higher replacement rates.

[12] See Butrica et al. (2012), Table 6.