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Replacement Rates and the Retirement Crisis

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Andrew G. Biggs
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Abstract

In 2014, the annual Social Security Trustees Report removed measures of Social Security replacement rates, which represent Social Security retirement benefits as a percentage of pre-retirement earnings. The Trustees expressed concerns that the Social Security Administration's (SSA) actuaries' methodology produced results that differed meaningfully from other common approaches. In 2023, the Social Security Trustees returned replacement rates to the report, without changes to the SSA methodology or discussion of their decision.¹ The SSA replacement rate methodology produces the well-known result that Social Security replaces about 40 percent of a "medium wage" worker's pre-retirement earnings. However, that calculation is based upon a stylized worker whose annual earnings as represented in the replacement rate calculation are 42 percent higher than the inflation-adjusted career-average earnings of a worker with an average age-earnings profile. For a worker who earned the age-adjusted average wage, Social Security replaces about 54 percent of the final 35 years of inflation-adjusted earnings, a roughly one-quarter increase relative to the SSA's figures. Moreover, the difference between the SSA's replacement rates and those measured relative to inflation-adjusted career-average earnings grows when the assumed rate of real wage growth is higher. This is significant for projections of future retirement income adequacy, as the Trustees project future wage growth that exceeds what many past cohorts of Social Security participants experienced. Using a SSA projection of total retirement incomes from all sources, it is shown that a projected increase in the share of retirees with low replacement rates is a product of these assumptions. When replacement rates are measured relative to career-average earnings adjusted for inflation, future cohorts of seniors are projected to have similar replacement rates to past and present retirees.

Any assessment of the retirement savings adequacy of households must contain a standard of retirement income sufficiency. That is to say, in addition to projecting how much income seniors will have, we also must know how much income is enough. Both mainstream economic theory and standard financial planning work from the premise that individuals generally wish to maintain their pre-retirement standard of living once they reach old age.²

Replacement rates, which express retirement income as a percentage of pre-retirement earnings, are a common shorthand measure of how well a retiree can maintain their pre-retirement standard of living. However, maintaining one's pre-retirement standard of living does not imply that retirement incomes must equal pre-retirement earnings. A variety of costs of living decline in retirement, such as lower taxes, the disappearance of work-related costs, and the prevalence of paid-off mortgages. According to the Social Security Administration, "Most financial advisors say that people need about 70 percent of their pre-retirement income to live comfortably in retirement. Social Security replaces only a portion of that amount-about 42 percent for the average worker."³

Some financial planners recommend higher replacement rates of 85 percent or greater. By contrast, Peter Brady concludes that a typical senior can maintain their pre-retirement standard of living with an income equal to about 60 percent of their pre-retirement earnings.⁴ Biggs (2022) finds that households aged 65 and over typically spend about one-third less than at age 50, when household spending tends to peak.⁵ Nevertheless, the accuracy of the 70 percent target replacement rate recommended by the SSA is not central to the discussion of this paper, which is applicable regardless of the target replacement rate figure believed to be appropriate.

However, there is no single agreed-upon methodology by which to calculate replacement rates. Traditionally, replacement rates were often measured relative to final earnings. As the Government Accountability Office stated, "Generally, [the replacement rate] is calculated as the ratio of retirement income in the first year of retirement to household income in the year immediately preceding retirement."⁶ For many years replacement rates printed in the annual Social Security Trustees Report were measured relative to final earnings.

While final-earnings replacement rates may be useful in certain cases, such as a long-term employee at a single firm, among the general population earnings can vary significantly from year to year. Moreover, the life cycle hypothesis in economics predicts that individuals will attempt to smooth consumption over many years, and so economists tend to favor replacement rates that are measured relative to earnings over much longer periods. As the SSA's Dean Leimer pointed out, "because lifetime earnings streams differ markedly between individuals, [final year] preretirement earnings are not representative of lifetime earnings positions. Thus, if a lifetime concept of the replacement base is desired, then earnings must be averaged over many years."⁷ In separate works, Boskin and Shoven and Rettenmaier and Saving advocated measuring replacement rates relative to the inflation-adjusted average of lifetime earnings, which captures the potential average lifetime expenditures of a typical worker.⁸

In contrast to financial planners and economists, Social Security's actuaries calculate replacement rates using a method that effectively compares the Social Security benefits received by an average new retiree in a given year to the average wage of earnings for workers in the labor force in that same year, not to retirees' own pre-retirement earnings. The approach of

comparing retiree incomes to the incomes of non-retirees represents the relative financial statuses of different age groups in the population, but does not convey information regarding how well seniors can maintain their own pre-retirement standard of living.⁹ If replacement rates are to contribute to individuals' and policymakers' understanding of Social Security policy and retirement savings adequacy, is important to clarify how replacement rates are calculated and what these calculations signify.

Moreover, the Social Security actuaries' methodology for calculating replacement rates is sensitive to the rate of economy-wide wage growth, such that measurements of total retirement income replacement rates, inclusive of both Social Security benefits and other sources of income, will vary over time based upon the rate of wage growth that is assumed for future years. This approach can provide a misleading viewpoint of changes over time in households' ability to maintain their standard of living in old age.

Measuring Social Security replacement rates

Based upon the Social Security Administration's administrative data, the SSA publishes factors that for each age expressing the probability of working and average earnings contingent upon working. These factors are designed to allow users to generate more plausible average age-earnings profiles.¹⁰ Multiplying the two "raw" factors produces expected earnings by age. For instance, at age 21 individuals are reported to have an 82.3 percent probability of working and, contingent upon working, have earnings equal to 28.3 percent of the national average wage. Expected earnings at age 21 are reported as 23.3 percent of the average wage.

To simulate Social Security replacement rates for a worker with an age-adjusted average wage, I apply the raw SSA factors to generate an age-earnings profile for an individual born in 1956, who begins working at age 21 and retires in 2023 at the normal retirement age. That stylized worker would receive an annual benefit of about \$25,013.

If we assume that working-age individuals tend to smooth their consumption from year to year and that retirees wish to maintain the standard of living they enjoyed during their working years, then a reasonable Social Security replacement rate might compare the initial benefits an individual receives at retirement age with the inflation indexed average of that same individual's pre-retirement earnings. Adjusted for inflation using the Consumer Price Index for Urban Wage-Earners, the measure of inflation used by the SSA, this stylized worker's earnings from age 21 through age 66 average \$41,030 annually. This produces a replacement rate relative to career-average earnings of 61.0 percent.

Many workers may be unable to smooth their standard of living early in their careers due to the inability to borrow, as the life cycle model would predict they would seek to do. This lowers their potential consumption earlier in their careers relative to what they could attain later. For this reason, it may be considered reasonable to compare Social Security benefits to the final 35 years of inflation-adjusted earnings prior to retirement. Doing so produces a Social Security replacement rate of 53.9 percent of pre-retirement earnings. If a typical worker hoped to achieve a 70 percent total retirement income replacement rate, Social Security benefits would cover approximately 77 percent of his or her retirement income needs.

According to the 2023 Trustees Report, Social Security pays a medium wage worker retiring in 2023 at the normal retirement age a benefit equal to 42.6 percent of their pre-retirement earnings.¹¹ What accounts for the difference between the Trustees figure and the replacement rate for an average worker calculated above? The answer encompasses several steps.

First, while the SSA methodology begins with the age-earnings profile outlined above, generated by multiplying mean earnings by age by the probability of working by age, the SSA increases the nominal earnings generated by that process for each year by 21.6 percent. This step increases inflation-adjusted average earnings over the final 35 years of employment to \$56,423. These nearly 22 percent higher earnings result in a Social Security retirement benefit that, due to Social Security's progressive benefit formula, increases by only about 13 percent, to \$28,204. This reduces the replacement rate to 50 percent. The reason for this 21.6 percent upward adjustment to annual nominal earnings will be discussed in greater detail below.

Next, the SSA replacement rate methodology "wage-indexes" the stylized worker's nominal earnings rather than adjusting them for inflation. While inflation adjustment increases the nominal value of earnings from the year the earnings occurred to retirement age by the rate of growth of prices, wage-indexing adjusts nominal earnings upward by the growth of national average wages. As long as real wage growth is positive, meaning that national average wages grow faster than inflation, wage-indexed earnings will always be higher than inflation-indexed earnings and wage-indexed replacement rates always will be lower. Wage-indexing increases the measure of the medium earner's final 35 years of earnings to \$65,664. This is entirely a change to the way earnings are expressed in a replacement rate calculation; the earner's benefit remains unchanged at \$28,204, thereby reducing the calculated replacement rate to 43.0 percent.

Finally, the SSA replacement rate calculation expresses career-average earnings not as the final 35 years of earnings but as the highest 35 years of earnings. This step marginally increases the measured value of career-average earnings to \$66,015. Again, since retirement benefits are unaffected, the measured replacement rate declines to 42.6 percent, the value published in the Social Security Trustees Report.

For a stylized medium earner retiring in a given year, the SSA replacement rate methodology effectively equates that worker's career-average pre-retirement earnings with the average wage of all employees working in that year. For instance, a medium wage worker retiring in 2023 is taken to have had pre-retirement earnings over his career averaging \$66,207.¹² This figure slightly *exceeds* the projected \$66,147 average wage of all workers employed in 2023, despite real wages having grown significantly over the past several decades. A replacement rate that compares the Social Security benefits of individuals retiring in a given year to the earnings of workers in the labor force in that same year is both philosophically and quantitatively different from comparing a new retiree's Social Security benefit to his or her own past earnings. A replacement rate for a person is calculated in which literally nothing related to that person is being replaced. Rather, one person's Social Security benefit at retirement age is expressed as a percentage of everyone else's average earnings regardless of their age.¹³

The difference between the 53.9 percent replacement rate calculated relative to the final 35 years of inflation-adjusted earnings for a worker with age-adjusted average earnings to the 42.6 percent

replacement rate based on the average of the highest 35 years of wage-indexed earnings for a stylized medium worker whose annual earnings are 21.6 percent above the age-adjusted average is significant. Again assuming a target total retirement income replacement rate of 70 percent, Social Security benefits would be sufficient to provide an average worker with 77 percent of their total income in the former case and only 61 percent in the latter. There are two explanations for the different approaches to calculating replacement rates. The first is based on differing economic philosophies, the latter on a practical intent to maintain a long-used factoid regarding the adequacy of Social Security retirement benefits.

Both the economic perspective based on the life cycle hypothesis and practical financial planning advice accept the premise that most individuals seek to smooth their standard of living from year to year and, more specifically for this case, from work into retirement. Based on these premises, replacement rates calculated relative to the inflation-adjusted average of pre-retirement earnings provides information on Social Security benefits' ability to maintain the purchasing power that retirees enjoyed during their working years.

By contrast, advocates of calculating replacement rates relative to wage-indexed career-average earnings argue that retirees do not target the ability to maintain their pre-retirement standard of living but instead wish for a standard of living that keeps up with the standard of living enjoyed by working-age households. Goss et al. (2014) state that wage-indexing career-average earnings "effectively equates earnings levels over time relative to the standard of living of workers of the day. As the standard of living rises over time, using wage indexed career-average earnings brings the average up to date to the standard of living at the end of career." The Center for Retirement Research's National Retirement Risk Index (NRRI) also employs wage-indexed earnings in setting target replacement rates to measure the adequacy of total retirement incomes. One of the NRRI's authors, states:

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.

However, this assumption is at odds with most conventional economic theory and with the ordinary practice of financial planning.

The Social Security Trustees raised concerns regarding wage-indexed replacement rates, stating that the SSA actuaries' "method of calculation produces 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."¹⁴ The Trustees' concerns drew in part on Biggs and Springstead (2009) which found a wide range of plausible replacement rate definitions and results. Based on such concerns, in 2014 the Trustees eliminated replacement rates from their annual report. While internal discussions apparently took place regarding a substitute measure, no replacement was agreed upon and for nearly a decade replacement rates were absent from the Trustees Report.

The Trustees' removal of replacement rates from their annual report prompted various government agencies to more deeply consider how replacement rates are calculated and used. None of these independent evaluations appeared to support the practice of estimating the adequacy of Social Security benefits by comparing those benefits to wage-indexed career-average earnings, as had been the practice in the years leading up to 2014.

In a 2016 review of replacement rate methodology, the Government Accountability Office stated,

*Economists broadly agree that a conceptual benchmark measure for adequate retirement saving is an amount that will ... allow a household **to maintain its pre-retirement standard of living** into retirement.... The goal of the target replacement rate may be to replace earnings right before retirement or to smooth consumption over a retiree's life.¹⁵ [Emphasis added.]*

There is no mention of seeking to maintain the standard of living of workers in the labor force at the time the individual is retired.

The CBO in 2014 wrote that "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."¹⁶ In a more wide-ranging 2019 review of replacement rates, the CBO noted:

*Social Security replacement rates are used to determine the extent to which benefits enable retirees to **maintain their preretirement standard of living**.... Price adjustment [of career-average earnings] is generally used to compare the purchasing power of retirees' benefits with the purchasing power of their own earnings when they were still working; wage adjustment is used to compare the purchasing power of retirees' benefits with the purchasing power of earnings of workers who are currently in the labor force.¹⁷ [Emphasis added.]*

Similarly, the Social Security Administration's Patrick Purcell notes that "Social Security bases retired-worker benefits on the worker's earnings through age 60 indexed to national average wages. For purposes other than calculating Social Security benefits, however, past earnings [for the calculation of replacement rates] are more commonly indexed to prices."¹⁸

All of this is consistent with the origins of the life cycle hypothesis, in which Ando and Modigliani noted that their model "starts from the utility function of the individual consumer: his utility is assumed to be a function of *his own* aggregate consumption in current and future periods."¹⁹ [Emphasis added.] Neither mainstream economics nor financial planning are typically concerned with "Keeping up with the Joneses," while the SSA's measures of replacement rates embed that assumption deeply in the methodology.

The aforementioned discussion by several government agencies appeared not to generate similar reflection on the part of the 2023 Trustees, who returned replacement rates to the annual report entirely unchanged from prior methodology with no reference to the 2013 removal and no explanation for reversing the decision of the 2013 Trustees.

A second, more practical, objective may better explain why the Social Security actuaries and Trustees adopted a replacement rate methodology that differs from those used by financial planners, economists or government agencies. Prior to 2002, the SSA measured replacement rates as many financial planners do, “as a percentage of earnings in the 12-month period preceding retirement.”²⁰ Replacement rates for a stylized medium wage worker who earned the national average wage every year of their career hovered about 40 percent of pre-retirement earnings. These figures are the source of the common perception that Social Security typically replaces about 40 percent of pre-retirement earnings.

Over time, the SSA became aware that the stylized steady-earnings patterns used to illustrate replacement rates did not closely resemble actual workers participating in Social Security. The national average wage as measured by SSA is contingent upon working, but most individuals do not work every year of their career. As a result, the average worker earns less over their career than a worker who is employed each year earning the national average wage. The Urban Institute’s Eugene Steuerle, Christopher Spiro, and Adam Carasso cite SSA analysis finding that the stylized workers SSA used prior to 2002, who were assumed to earn the national average wage every year of their career, had average annual lifetime pre-retirement earnings 51 percent higher than a typical worker in the middle quintile of the population.²¹ If so, a true typical worker would receive a higher replacement rate than the roughly 40 percent commonly reported by the Social Security Administration, given that Social Security’s progressive benefit formula generally delivers higher replacement rates to lower-earning workers.

To address these issues, SSA’s actuaries used administrative data on age-specific earnings and employment probabilities to generate stylized workers with more realistic lifetime earnings profiles.²² However, using these more plausible age-earnings profiles would have produced final-earnings Social Security replacement rates for a typical worker considerably higher than the well-known 40 percent figure.

In response, SSA first altered its measure of pre-retirement earnings from final earnings to the highest 35 years of wage-indexed earnings, then further increased annual earnings by almost 22 percent to calibrate the resulting replacement rates to match the roughly 40 percent figure produced using the previously stylized worker who earned the national average wage each year. In other words, in designing the new medium scaled-earner used to illustrate Social Security benefits and replacement rates, the outcome was pre-determined to replicate the previous results.

Moreover, at this point in time using stylized workers to illustrate Social Security replacement rates is neither necessary nor productive. Various research has shown that no stylized age-earnings profile, even if adjusted up or down to represent higher or lower lifetime earnings, is particularly representative of a typical worker at any given lifetime earnings level. Barry Bosworth and his co-authors show that only around one-fifth of male workers and one-half of female workers have age-earnings patterns that are similar to the hump-shaped earnings of SSA’s scaled earners.²³

Moreover, the availability of administrative data and microsimulation models allow for more accurate and detailed expositions of Social Security replacement rates, making the reliance upon stylized workers unnecessary. Biggs and Springstead, using a microsimulation model of

Americans newly-retiring in 2005, found that for the middle quintile of lifetime earners Social Security benefits replaced 47 percent of wage-indexed career average earnings, despite the fact that the average American claiming benefits in 2005 did so over one year prior to the Full Retirement Age and therefore received a reduced benefit.²⁴ Typical retirees received higher replacement rates than the SSA's stylized medium scaled earner for several reasons, including that the median earner has lower earnings and a higher replacement rate than even an average earner, much less the above-average earning medium scaled earner, and because the analysis included auxiliary spousal and widow benefits while SSA's scaled earners do not. Biggs and Springstead found a typical replacement rate of 56 percent inflation-adjusted career-average earnings.

In short, SSA should use either its microsimulation models or administrative data to calculate actual replacement rates relative to inflation-adjusted career-average earnings, rather than using nonrepresentative stylized earnings to calculate replacement rates relative to a measure of pre-retirement earnings that credits participants with more purchasing power than they actually had.

Replacement rate methodology and the “retirement crisis”

Issues with the SSA replacement rate methodology extend further when it is applied to calculating replacement rates based upon total retirement incomes. While the SSA actuaries and Trustees do not calculate total retirement income replacement rates, other analysts in the SSA have often adhered to the actuaries' methodology for their own studies. As discussed above, the SSA approach to calculating replacement rates will make retirement income adequacy appear lower by assuming that retirees wish to match the incomes of workers at the time of their retirement rather than maintain their own, generally lower, pre-retirement standard of living. But, in combination with the Social Security Trustees' assumptions for real wage growth, the SSA replacement rate methodology also will cause the future of retirement security to appear worse than the present, precipitating fears that Americans face a “retirement crisis” of inadequate incomes in old age.

Recall that, so long as national average wage growth exceeds inflation, wage-indexed career-average earnings will always be higher than inflation-indexed earnings and so wage-indexed replacement rates will always be lower than inflation-indexed replacement rates. But the gap between wage-indexed and inflation-indexed career earnings grows larger when the assumed rate of real wage growth increases. And that appears to be what is occurring with projections of future retirement incomes.

Perhaps the most credible study predicting a significant decline in retirement income adequacy came from the Social Security Administration, published in 2012.²⁵ The SSA study, co-authored by Barbara Butrica and Karen Smith of the Urban Institute and Howard Iams of the SSA, used the most advanced and detailed model of the population and retirement income sources available, the SSA's Model of Income in the Near Term (MINT). That study projected that future seniors will have significantly lower replacement rates than past retirees, with a larger share of future retirees with incomes below 75 percent of their pre-retirement earnings. Updated unpublished projections produced for the author using a more recent iteration of the MINT model continue to produce similar results.

The SSA study calculated that the median American senior who was born during the Great Depression era of 1926 to 1935 had a total retirement income equal to 95 percent of their wage-indexed career average earnings. Thirty-five percent of seniors born during the Depression era had a retirement income replacement rate under 75 percent, a measure designed to capture the share of seniors with inadequate retirement incomes. Moving forward to Generation X, born from 1966 to 1975, the SSA MINT model projects that the median Gen X retiree will have a wage-indexed replacement rate of only 84 percent, with 43 percent having replacement rates below 75 percent. In simple terms, that is the so-called retirement crisis.

But the SSA projection that future retirees will have lower retirement income adequacy than past and present seniors is in fact entirely dependent upon use of the SSA actuaries' methodology for calculating replacement rates. That same 2012 SSA study also published replacement rates measured relative to career-average *inflation-adjusted* earnings, which I argued are a more reasonable measure of retirement income adequacy. And those inflation-adjusted replacement rate figures project that Americans' retirement income security will actually *improve* slightly.

Depression-era birth cohorts had a median inflation-indexed replacement rate of 109 percent of their pre-retirement earnings, with 26 percent of seniors having replacement rates below 75 percent. That's a more encouraging baseline picture. Even more importantly, by the time the Gen X birth cohorts retire the median senior will have a replacement rate of 110 percent of their inflation adjusted pre-retirement earnings, with only 25 percent having replacement rates below 75 percent. In other words, using a more plausible measure of replacement rates that is more consistent with economic theory and financial planning methods, retirement income security is improving rather than declining.

The factor that accounts for the difference between projected wage- and inflation-indexed replacement rates is that the Social Security Trustees Report assumes higher rates of real wage growth for the future than occurred in the past. To explore this, I create two stylized lifetime earnings patterns using the SSA actuaries' scaled medium earner.²⁶ The first is born in 1930 and is designed to be representative of the Depression-era birth cohorts, while the second is a Gen Xer born in 1970. Each begins working at age 21 and works through age 64. For each stylized worker I calculate both the inflation-adjusted average and the wage-indexed average of the final 35 years of earnings and compare the two.

For the stylized worker born in 1930, their wage-indexed career-average earnings are two percent larger than their inflation-adjusted earnings. Thus, if the worker had a 70 percent total retirement income replacement rate when measured in inflation-indexed terms, their wage-indexed replacement rate would be about 69 percent, a difference of slightly over one percentage point. For the stylized earner born in 1970, however, their wage-indexed career average earnings exceeded their inflation-adjusted earnings by 23 percent. If that earner had a total retirement income replacement rate of 70 percent when measured in inflation-adjusted terms, their wage-indexed replacement rate would be only 57 percent, a difference of 13 percentage points.²⁷

Higher national average wage growth over the course of the Gen X cohorts' working careers would tend to widen the gap between wage-indexed and inflation-indexed replacement rates. But it is worth noting that much of the increase in wage growth over the Gen X cohorts' careers is

the result of the Trustees' projections, not of having experienced unusually high real wage growth to date. From 1992 to 2020, the national average wage increased at a real annual rate of 0.9 percent; from 2020 to 2035, when the stylized Gen Xer born in 1970 would reach age 65, real wage growth is assumed to average 1.4 percent annually. So, at least in part, the "retirement crisis" projected by the SSA's MINT model is due, not merely to the employment of an inappropriate replacement rate methodology, but also to projections of real wage growth that could turn out to be different.

The authors of the 2012 SSA study understood this, writing that the widening gap between wage- and inflation-indexed replacement rates was "a result of differential real wage growth between cohorts." The authors did not take the point further, which is unfortunate as the broad question explored by the paper – whether Americans face declining or roughly steady preparation for retirement – appears to hinge on it.

That Social Security's Trustees assume higher real wage growth for the future than the economy has experienced in the past may be surprising for those who follow Social Security policy, as it has often been argued that Social Security's Trustees economic assumptions are pessimistic. For instance, Chrisian Weller and Edith Rasell stated in 2000, "the [Trustees] report continues to be based on pessimistic assumptions about the future economy."²⁸ Dean Baker, Brad DeLong and Paul Krugman, writing in 2005, referred to "the pessimistic projection of the Social Security trustees that very long run labor productivity growth will average 1.6 percent a year."²⁹ However, what Social Security's finances care about is the growth of wages, since wages are taxed to pay benefit and wage growth is factored into the tax and benefit formulas in a number of ways. And real wage growth, while obviously dependent upon the growth of productivity, also depends upon changes in myriad other factors such as the labor share of GDP and the wage share of total compensation.

Regardless, Social Security's Trustees assume future wage growth that is healthy relative to what Americans have experienced over the last half century. And yet, ironically, it is that optimistic assumption for real wage growth that creates the pessimistic conclusion that future American seniors face a retirement crisis of inadequate incomes and savings.

Conclusions

A great deal hinges on households' and policymakers' judgment of the adequacy of U.S. retirement savings. If Americans fear a retirement crisis of inadequate incomes in old age they may increase the amounts they save today, foregoing alternate uses of those funds. Likewise, if policymakers fear a significant shortfall in future retirement incomes they may choose to expand Social Security, the revenues necessary for which would then be unavailable for other governmental purposes.

Discussion of retirement income adequacy often hinges upon issues such as whether employees are offered a retirement plan at work; the rate at which employees participate and contribute; and labor supply at older ages and Social Security claiming ages. All of those issues are of course important. And yet, at least based upon the Social Security Administration's projections of future retirement incomes, our judgment of future seniors' retirement income adequacy depends not upon answering the question "How much?" but rather "How much is enough?" That is, whether

we think Americans face a retirement crisis or an improvement in their retirement income adequacy depends less on what we think about how much we're saving for retirement and more on how much we think households *need* to save for retirement.

Specifically, the discussion here shows that the same projected levels of retirement income can lead to dramatically different assessments of retirement income adequacy depending upon whether income adequacy is defined as maintaining one's own pre-retirement standard of living versus maintaining a standard of living that rises with the wages of workers then in the labor force. Only the former is a true measure of retirement income adequacy in the conventional sense that financial planners or economists think of things, while the latter is premised on a relative income approach in which individuals are assumed to wish to "Keep up with the Joneses."

Moreover, Keeping up with the Joneses – in this case, with the wages of employees in the labor force at the time an individual is retired – grows more difficult when the rate of economy-wide wage growth is higher. The Social Security Administration's projections of a significant decline in median retirement income replacement rates and increase in the share of seniors with low replacement rates is entirely driven by the assumption that seniors desire an income that rises along with national average wages. If retirees are instead assumed to desire an income that allows for a similar standard of living of living that they enjoyed prior to retirement, a standard that is more consistent with financial planning and the life cycle hypothesis in economics, retirement income adequacy is found to improve in future decades.

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² In the life cycle hypothesis constant consumption from year to year depends upon a number of common simplifying assumptions, such as that the rate of time preference equals the interest rate available on savings and that the individual or household's ability to derive utility from consumption is the same at every age.

³ Social Security Administration, Social Security Fact Sheet, (2023).

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⁷ Dean R Leimer, The Role of the Replacement Rate in the Design of the Social Security Benefit Structure, (Department of Health, Education, and Welfare, Social Security Administration., 1979).

⁸ Michael J Boskin and John B Shoven, "Concepts and measures of earnings replacement during retirement," in *Issues in pension economics* (University of Chicago Press, 1987). and Andrew J Rettenmaier and Thomas R Saving, "How Generous Are Social Security and Medicare?," *Policy Report* 290 (2006).

⁹ Mitchell and Phillips (2006) notes that in other parts of the world incomes for seniors are sometimes compared to the incomes of working-age households. See Olivia S Mitchell and John WR Phillips, "Social Security replacement rates for alternative earnings benchmarks," *Paper No. WP* 116 (2006).

¹⁰ Kyle Burkhalter and Chris Chaplain, Scaled factors for hypothetical earnings examples under the 2023 Trustees Report assumptions, (Baltimore, Maryland 2023).

¹¹ See Table V.C7. Annual Scheduled Benefit Amounts for Retired Workers With Various Pre-Retirement Earnings Patterns Based on Intermediate Assumptions, Calendar Years 2023-2100.

¹² This figure is obtained by dividing the \$28,204 annual benefit for a medium wage worker claiming benefits in 2023 by the 42.6 percent reported replacement rate for that worker. See Social Security Trustees (2023), Table V.C7.- Annual Scheduled Benefit Amounts for Retired Workers With Various Pre-Retirement Earnings Patterns.

¹³ Moreover, who that "everyone else" is changes over time as the composition of the working population changes. Leimer notes that when the population is aging, national average wages will grow more quickly than wages in any birth cohort because of a reweighting effect where older, higher-paid workers become an increasing share of the labor force.

¹⁴ Social Security Trustees, The 2013 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, (Washington, D.C.: Government Printing Office, 2013).

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¹⁹ Albert Ando and Franco Modigliani, "The 'life cycle' hypothesis of saving: Aggregate implications and tests," *The American economic review* 53, no. 1 (1963).

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²⁵ Barbara A Butrica, Karen E Smith, and Howard M Iams, "This is not your parents' retirement: comparing retirement income across generations," *Social Security Bulletin* 72 (2012).

²⁶ The effects measured here would be identical if instead I created a stylized earner from the SSA actuaries' raw scaling factors.

²⁷ All figures are based on current Trustees Report data and Trustees projections for future growth of the Average Wage Index.

²⁸ Christian E Weller and Edith Rasell, *Getting better all the time: Social Security's ever-improving future*, The Economic Policy Institute (2000).

²⁹ Dean Baker, J Bradford De Long, and Paul R Krugman, "Asset returns and economic growth," *Brookings Papers on Economic Activity* 2005, no. 1 (2005).