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The Impact of a Social Security Proposal for "Catch-Up" Contributions

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Abstract

Social Security "Catch-Up contributions would allow workers to contribute an additional 3.1 percent of salary, starting at age 50, in return for enhanced benefits. The program builds on the progressivity of the existing Social Security benefit formula. We construct an intertemporal optimization model, incorporating the interaction between retired worker, spousal, and survivor benefits, and show that for plausible rates of return on financial assets, coefficients of risk aversion, and mortality assumptions, even high lifetime earners would benefit from participation. Thus, the analysis speaks to the debate as to whether the Social Security actuarial shortfall should be bridged by benefit cuts or tax increases. We argue that in in contrast to proposals to allow workers to purchase additional Social Security benefits with 401k) plan balances, the program would be unlikely to suffer from adverse selection. The program would reduce the Social Security actuarial shortfall in the short run and be approximately actuarially neutral over the long run. The program would not solve the retirement saving crisis, but would modestly reduce poverty and near poverty.

Social Security "Catch-Up" contributions would allow American workers to increase their Social Security benefits starting age 50. Simulations of the program show that households at all income levels would benefit from a 3.1 percent extra contribution to Social Security. Under several simulated conditions, people would have to contribute much more to 401(k), IRAs, with or without annuitization to get the equivalent benefit. Advance-funded employer plans are still needed to get adequate replacement rates. The "Catch Up" proposal won an AARP innovation grant, could be implemented today, making all older workers better off and without making

Social Security funding worse. We are encouraged by widespread popular support for Social Security.

Keywords: Social Security, retirement, catch-up contributions

The Impact of a Social Security Proposal for "Catch-Up" Contributions

Social Security is the fundamental basis of Americans' retirement security, providing universal coverage, progressive benefits, lifetime inflation-indexed income, and low administrative costs. But even using favorable assumptions, only half of working age households are on track to maintain their standard of living in retirement, down from 70 percent in 1986 (Munnell, Hou & Sanzenbacher, 2018). In theory, employer sponsored retirement plans and private savings should fill the gap. But, wealth accumulations in employer sponsored retirement plans fall far short of what is needed, and the broad mass of the population saves little outside of such plans.

Currently, the proposed solutions for low and middle-income, mid-career workers – working longer and saving more – are derisory and not feasible. Working into one's late sixties and seventies is not practical for most. Employers provide inadequate age-inclusive training programs (Rooij, 2012); employers experience distinct differences in cognitive and learning abilities of older workers (Ownby, Czaja, Loewenstein & Rubert, 2008) that plausibly inhibit work and contributes to statistical age-based discrimination (Derous & Decoster, 2017; Neumark, Burn, & Button, 2016; Von Shrader & Nazarov, 2016) and anecdotes of ageism (Winerip, 2013) in even easy-to-enter jobs appear in newspapers frequently (Lee & Hymowitz, 2015). Many mid-career workers would have to save up to an implausibly large 41 percent of their incomes to get back on track (Munnell, Golub-Sass, & Webb, 2011).

This paper evaluates a proposal to help mid-career workers narrow the gap between what they need in retirement and their projected retirement wealth. At age 50, workers would be defaulted into Social Security "Catch-Up" contributions of 3.1 percent of salary, 50 percent of

their existing contributions, and credited with a 50 percent bonus in their earnings records for the years they participated. For example, a worker earning $50,000 a year would be credited with earnings of $75,000 instead of $50,000, and a worker earning $200,000 would be credited with earnings of $199,350 (1.5 times the 2019 taxable maximum of $132,900) instead of $132,900. The proposal uses the progressivity of the Social Security benefit formula to target low and moderate earners. The proposal would leave Social Security's 75-year actuarial shortfall unchanged and significantly reduce the 25-year shortfall (Ghilarducci, Papadopoulos, Sun, & Webb, 2018). We distinguish our plan with proposals to carve individual accounts out of Social Security (Weller, 2000), which expose participants to investment risk. We are also motivated by the persistent popularity of Social Security.

We call our proposal Social Security "Catch-Up" mirroring the term commonly used to describe the provision in the tax code that increases the 401(k) contribution limit for workers over 50. We chose a 3.1 percent contribution rate based on knowledge of the PIA formula and the distribution of earnings. Though we have not conducted an empirical analysis of optimal contribution rates, 3.1 percent is large enough to yield significant benefits for the vast majority, but small enough for the program to be attractive to higher income workers.

The AARP selected the proposal for further development and financial support as part of its 2016 "Innovation Challenge." The output was a study that evaluated the attractiveness of Catch-Up contributions to single individuals (Ghilarducci, Papadopoulos, Sun, & Webb, 2018). But most people enter retirement as part of a married couple. Since Social Security provides retired worker, spousal, and survivor benefits, the Catch–Up program affects couples and singles differently due to the impact of Catch-Up contributions on spousal and survivor benefits. Although the Social Security system has been gender-neutral since 1983, most wives in the

cohorts approaching retirement (Butrica & Smith, 2012) earned less than their husbands and will switch from a retired worker to a survivor benefit when her husband dies. And, some lower earning spouses, mostly women, top-up their retired worker benefit with a spousal benefit.

This study evaluates the attractiveness of Catch-Up contributions to married couples, compares results with those for singles and considers whether the program might suffer from adverse selection, with high income and high mortality households opting out. The study constructs an intertemporal optimization model of the participation, savings, and asset de-accumulation decisions faced by married workers. The model shows that, taking account of the additional longevity insurance purchased with Catch-Up contributions, the program is attractive at all income levels and among both low and high mortality groups, and also more attractive than commercial annuities. The program is somewhat less attractive to a shrinking minority of secondary earners with low earnings relative to those of their spouse.

The study is also relevant to the broader question of whether Social Security's actuarial shortfall should be resolved by tax increases or benefit cut by showing that, at the margin, even high lifetime earners, who get lower returns from Social Security than low and medium earners, would prefer higher Social Security taxes to benefit cuts.

The next section describes the current structure of Social Security. The third section describes our four yardsticks used to evaluate the potential benefit of the Catch-Up plan. The fourth section presents our results, and the fifth section discusses and concludes.

CURRENT LAW STRUCTURE OF SOCIAL SECURITY BENEFITS

Individuals can claim retired worker benefits at any age from 62 to 70, subject to an actuarial adjustment if not claimed at their Full Retirement Age (FRA). The Primary Insurance Amount (PIA) – the retired worker benefit payable at their FRA – is calculated by wage-

indexing lifetime earnings to age 60, calculating Average Indexed Monthly Earnings (AIME), the monthly average of the highest 35 years wage-indexed earnings, and then applying a three-part benefit formula that gives higher replacement rates to lower lifetime earners. Under the Catch-Up proposal, the calculation of AIME would include the 50 percent bonus, where applicable. Catch-Up contributions will increase retired worker benefits provided the Catch-Up year counts as one of the 35 highest earning years. The progressive PIA formula causes higher earners to receive smaller increases in benefits per dollar of increase in AIME.

Spouses of retired workers can claim spousal benefits, provided they have turned age 62 and their spouse has claimed their own retired worker benefit. At their FRA, spouses are entitled to benefits of one half of their spouse's PIA. The benefits of spouses claiming early are actuarially reduced, by 30 percent for those claiming at age 62 but do not increase if the spouse delays claiming beyond the FRA.

If a spouse is entitled to both a spousal and a retired worker benefit based on their own contributions, their retired worker benefit is paid first. If the spousal benefit is higher than their own retired worker benefit, the spouse will get a combination of benefits equaling the higher spousal benefit.

Catch-Up contributions will therefore increase spousal benefits, but only of spouses with very low or zero lifetime earnings whose spousal benefit exceeds their own retired worker benefit. Since more married women now work, spousal benefits have become a shrinking share of household retirement income. Less than a third of Early Boomer women born 1948-53, who became eligible for benefits between 2010 and 2015, were entitled to spousal benefits (Sass, 2016).

Surviving spouses can also claim a survivor benefit based on their late spouse's earnings record if that exceeds their own retired worker benefit. The amount of the survivor benefit depends on their claim age and the deceased spouse's monthly benefit. Surviving spouses without dependents can claim as early as age 60 to receive reduced benefits according to the number of months before their FRA, subject to a minimum monthly amount of 71.5 percent of the deceased worker's PIA. Surviving spouses with dependents can claim at any age. Surviving spouses who claim at or after their FRA receive an amount equal to 100 percent of their deceased spouse's benefit, subject to a minimum benefit of 82.5 percent of the deceased spouse's PIA.

Although the survivor benefit is gender neutral, most claimants in this cohort are women, reflecting women's lower lifetime earnings and lower retired worker benefits, their greater longevity, and gender age differences within marriage. Among those over age 65 in 2014, 10.4 percent of men and 34.0 percent of women are surviving spouses (authors' calculations from the Health and Retirement Study). For typical couples, the husband's Catch-Up contributions will increase his retired worker benefit and his spouse's survivor benefit, increasing the household's return to his Catch-Up contributions. In contrast, since a typical married woman's Catch-Up contribution would increase her retired worker benefits only until she collects a survivor benefit, her expected rate of return on Catch-Up contributions and the value she places on Catch-Up contributions would be lower than for a single woman. But, some married women may still earn a higher return on Catch-Up contributions than their husband, due to their lower earnings.[1]

YARDSTICKS FOR EVALUATING THE BENEFIT OF CATCH-UP CONTRIBUTIONS

We use four indicators or "yardsticks" to evaluate the benefit of Catch-Up contributions. The yardsticks focus on the effect on initial income, annual rate of return on Catch-Up contributions, willingness to pay for participation in the program, and a comparison with

401(k)s, IRAs, and voluntary annuitization. First, the impact on initial benefits and replacement rates. The replacement rate denominator equals AIME and the numerator equals PIA, and we sum the husband's and wife's AIME and PIA to arrive at a household level replacement rate. This metric omits the effect on a surviving spouse and the additional longevity insurance provided by Catch-Up contributions, but may be the most salient to households contemplating participation.

We CPI-index both AIME and PIA to the FRA. The PIA is in age-62 dollars, whereas the AIME calculation incorporates wage indexation to age 60, and current dollar amounts thereafter. This discrepancy is often overlooked and unless corrected, usually overstates replacement rates.

Even among workers who are not liquidity constrained, few delay claiming until what appear to be optimal ages (Sun & Webb, 2011). We decided against assuming that households select claim ages optimally to maximize expected lifetime utility as this would necessitate making assumptions about the disutility of work. Instead, we assume both husband and wife claim retired worker benefits at their FRA, which is slightly later than the current average claim age of 64 (Munnell & Chen, 2015).

Our second yardstick is the expected rate of return on Catch-Up contributions. This yardstick takes account of their impact on spousal and survivor benefits. Although surviving spouses with dependents can claim survivor benefits at any age, we assume all surviving spouses claim benefits on the death of their spouse or at age 66 if later. Our assumption avoids modeling eligibility for survivor benefits among surviving spouses under age 60, the impact of the Social Security earnings test on surviving spouses who have not yet retired, and evaluating alternative sophisticated claiming strategies that few people likely utilize, for example claiming survivor

benefit immediately upon the death of their spouse and switching to retired worker benefit at age 70.

Rate of return calculations understate the value of Social Security Catch-Up contributions because they disregard the value of the insurance the program provides against longevity and labor market risk. Households drawing down financial assets in retirement must trade-off the risk of outliving their wealth against the cost of unnecessarily restricting their consumption. Social Security solves this problem by providing a lifetime income, insuring households against the risk of outliving their wealth. Theoretical calculations show that for plausible preference parameters the value of longevity insurance is substantial for single individuals and somewhat lower for married couples, due to longevity risk pooling within the household, albeit still significant (Brown, Mitchell & Poterba, 2000). For plausible preference parameters, the marginal value of additional longevity insurance declines as the share of pre-annuitized wealth increases.

Our third yardstick is the "equivalent contribution rate" (ECR), the contribution rate at which a risk-averse household facing an uncertain lifespan would be indifferent between participating and not participating in the Catch-Up program. When the ECR exceeds 3.1 percent, the household is better-off participating, and when the ECR is less than 3.1 percent, the household is better-off opting out of the Catch-Up program.

We calculate the ECR by constructing an intertemporal optimization model in which risk-averse households facing mortality risk choose optimal levels of consumption each year. Individuals claim Social Security retired worker, spousal, and if applicable, survivor benefits at age 66. We calculate the contribution rate at which the household is indifferent between participating and not participating in the program. Our calculations disregard lifetime income from defined benefit retirement plans. These plans are disappearing in the private sector, and

annuitization is both rare and offered on unfavorable terms in 401(k) and other defined contribution plans.

Social Security provides insurance against experiencing worse than expected labor market outcomes because low earners earn higher returns on their contributions. Modeling realistic parameters of labor market risk is beyond the study's scope; the risk varies by household. Therefore, our third yardstick does not incorporate labor market risk. We make the simplifying assumption that the age-50 decision is non-revocable. Assuming surviving spouses claim survivor benefits at the later of age 66 and their age when their spouse died understates the value of Social Security's longevity insurance because young surviving spouses with dependents may have extremely high marginal utilities of consumption and claim early. We do not incorporate taxes because tax liabilities are household-specific.

We follow previous research (Brown & Poterba, 2000; Dushi & Webb, 2004) and assume the couple's utility is a summation of the husband and wife's utility:

$$U_t\left(C_{s,t}^m, C_{s,t}^f\right) = U_t^m\left(C_{s,t}^m, C_{s,t}^f\right) + U_t^f\left(C_{s,t}^m, C_{s,t}^f\right)$$

where the husband and wife's utility functions take the following form:

$$U_t^m\left(C_{s,t}^m, C_{s,t}^f\right) = \frac{\left(C_{s,t}^m + \lambda C_{s,t}^f\right)^{1-\gamma}}{1-\gamma}$$

$$U_t^f\left(C_{s,t}^m, C_{s,t}^f\right) = \frac{\left(C_{s,t}^f + \lambda C_{s,t}^m\right)^{1-\gamma}}{1-\gamma}$$

$C_{s,t}^m$ and $C_{s,t}^f$ denote the consumption of the husband and wife respectively in survivorship status s (married and both alive, surviving male, or surviving female) at time t. λ measures the jointness of consumption. When λ equals one, all consumption is joint. When λ equals zero, none of the household's consumption is joint. We assume that λ equals 0.5. γ is the coefficient of risk

aversion. We consider coefficients of risk aversion of two and five. These coefficients are at the lower end of the range reported in the literature, which tends to cluster between 2 and 10 depending in part on whether the estimates are derived from portfolio theory, purchases of insurance, economic experiments, or preferences over lotteries (Chetty, 2006). In our formulation, the coefficient of risk aversion is the inverse of the intertemporal elasticity of substitution. While acknowledging that the state contingent real annuity provided by Social Security may not be optimal (Yagi and Nishigaki, 1993) we treat reforms of the benefit structure as outside the scope of our study. The household's objective is to maximize their expected discounted lifetime utility:

$$\sum_{t=22}^{T}\sum_{s=1}^{3}\beta^{t-22}\rho_{s,t}U_t\left(C_{s,t}^{m},C_{s,t}^{f}\right)$$

where $\rho_{s,t}$ is the probability of the married couple being in marital status s at time t, and β is the time discount factor assumed to be 0.97 as is conventional in the literature.

We consider five types of married couples, and use mortality tables based on sex, which is why we use gendered terms for spouses: a high earner husband whose wife has high, medium, or low earnings, and a medium earner husband whose wife is a medium or low earner. We do not report results for households in which the wife never worked outside the home. Although a significant share of women in this birth cohort earns little relative to their husbands that they qualify for spousal benefit, only a small minority never worked for pay.[2] We note that results are not symmetric for higher earning men married to lower earning women, due to differences in life expectancy. We compare these couples with high, medium, and low earning single men, and medium and low earning single women.[3]

Each period, the household decides how much un-annuitized wealth to consume and at age 50, the household faces a one-time option to participate in the Catch-Up program. The optimal choices depend on financial wealth and whether both or only one of the spouses is alive. The problem is solved using dynamic programming.[4]

The household's budget constraint can be written as follows:

$$A_{t+1} = (1+r)\left(A_t + I^m_{s,t} + I^f_{s,t} + SS^m_{s,t} + SS^f_{s,t|d} - C^m_{s,t} - C^f_{s,t}\right)$$

where $A_t \geq 0$ all t is the household's unannuitized financial wealth at time t, and r is the risk-free rate. $I^m_{s,t}$ and $I^f_{s,t}$, respectively, are the husband and wife's labor income net of Social Security contributions, in marital status s at time t. They receive no labor income after retirement. $SS^m_{s,t|d}$ and $SS^f_{s,t|d}$ are the husband and wife's Social Security benefits payable at time t and in survivorship state s, conditional on the age d at which the husband dies .

In each case, we assume that both husband and wife were born in 1949, and retire in 2015, and that either the husband or both husband and wife made catch-up contributions since 1999, when they turned age 50. We chose to study this birth cohort to avoid making assumptions about trends in wages, inflation, mortality, mortality differentials, and age-earnings profiles. Results for the 1965 birth cohort, incorporating real wage growth and assuming no change in earnings inequality, are available from the authors as are results for couples with different ages. Results for the 1965 cohort show almost identical returns, with projected increases in longevity approximately offsetting the increase in the FRA. Results for couples with different ages are also similar.

Earnings are based on age-earnings profiles constructed by Clingman and Burkhalter (2016); which are calculated by first constructing a population average age-earnings profile and then multiplying earnings at each age by constants so that the AIMEs of very low, low, medium,

and high earning hypothetical workers equal 25, 45, 100, and 160 percent of the Average Wage Index, respectively. Among men, 71.5 percent have AIMEs less than the scaled high earner and 42.1 percent have earnings less than the scaled medium earner, and among women, 92.8, 72.5, and 34.5 percent have AIMEs less than those of the scaled high, medium, and low earners. We acknowledge that these age earnings profiles may differ from those experienced in real life (Au, Mitchell & Phillips, 2004; Bosworth, Burtless, & Steurle, 2000; Government Accountability Office, 1997; Hungerford, 2006). Specifically, workers typically have several years with zero earnings, often due to unemployment, child-care, or study. These zero earnings years will increase the likelihood that a Catch-Up year is counted as one of the top 35 and thus increase the return to Catch-Up contributions. Conversely, if a worker steps down to part time work at older ages, earnings in those years may be less likely to be counted as one of the top 35, reducing the return to Catch-Up contributions.

We did not use a structural estimation in which preference parameters are recovered from the data and used to simulate policy interventions effects (Gustman and Steinmeier, 2005). We acknowledge the potential concern that our model, and models like ours, predict much higher levels of annuitization than observed and ignores the gap between stated preferences for lifetime income and annuity demand – the so-called “annuity puzzle” (Brown, 2007). Household attitudes towards Social Security and annuities are contradictory. The Social Security program enjoys widespread political support, and opinion surveys indicate a preference for tax increases over benefit cuts (Walker, Reno, and Bethell, 2014), yet a significant minority, concentrated among those with lower levels of financial literacy, express a willingness to trade part of their benefits for a lump sum (Brown, Casey, and Mitchell, 2007).

Since studies and observation indicate preferences over drawdown strategies are heavily influenced by framing and defaults, perhaps because people do not know how to go thinking about the drawdown problem, it is not surprising they give contradictory answers. If household preferences are both malleable and influenced by status-quo bias, the greatest value of intertemporal optimization models may to help policymakers identify appropriate household choices and guide households towards (or even mandate) those choices rather than to predict behavior.

The fourth and final yardstick is a comparison of Catch-Up benefits with the benefits from 401(k) or IRA contributions used to purchase an inflation-indexed joint life annuity at age 66. The risk characteristics of Social Security differ from those of financial assets. Assuming that steps are taken to address Social Security's actuarial shortfall, the most significant risks to the program include adverse changes in mortality, fertility, and wage growth, all of which would likely also affect capital market returns (Krueger & Ludwig, 2007). Modeling and incorporating the covariance between mortality, fertility, wage growth, and capital market returns is beyond the scope of this study. We assume the return on Catch-Up contributions is risk free, and compares it with the return on risk-free financial assets. Although households can earn higher expected returns in stocks, we consider the risk-free assumption reasonable. Many households do not participate in the stock market, and few participants hold a 100 percent stock portfolio. Our model allows Catch-Up contributions to crowd-out savings in financial assets, and any crowd-out would likely be of the portions invested in cash and bonds.

RESULTS

Benefits payable at age 66

Table 1 reports the projected effect of Catch-Up contributions on benefits payable at age 66 and age 66 replacement rates. The upper panel shows results for singles and the lower panel shows results for couples. Consider the results for singles. The medium earner enjoys a larger increase in benefits ($226) than the low earner ($105) reflecting their higher lifetime earnings. But the increase for the high earner ($175) is somewhat less than for the medium earner reflecting their location on the higher segment of the three-part PIA formula. Medium and lower earners both enjoy similar percentage point increases in their replacement rates because their Catch-Up contributions place them on the middle segment of the PIA formula. Higher earners experience a smaller percentage point increase.

Turning to couples, when both the primary and secondary earner have similar PIAs, the Catch-Up contributions of primary earners increase household benefits by the same amounts as the Catch-Up contributions of single individuals with the same PIA. But when the secondary earner earns so much less that they qualify for a spousal benefit, the primary earner's Catch-Up contributions increase household benefits increase by more, reflecting the impact of Catch-Up contributions on spousal benefits, and the secondary earner's Catch-Up contributions provide no additional benefit.

The percentage point increases in household-level replacement rates are generally larger for medium than for high earners – up to 6.7 percentage points for the medium earner married to a low earner, increasing that household's Social Security replacement rate from 49.7 to 56.4 percent. Households will still need to rely on prefunded retirement wealth to attain target 70 percent plus replacement rates often deemed adequate to maintain pre-retirement consumption (Palmer, 2008).

Rate of return on Catch-Up contributions

For single individuals, we report rates of return for high, medium, and low earner men and medium and low earner women (Table 2 upper panel). For couples, we report the rates of return on 1) the primary earner's contributions, assuming the secondary earner does not contribute, 2) the secondary earner's contributions, given that the primary earner is already contributing, and 3) the sum of the primary and secondary earners' contributions (Table 2 lower panels). We implicitly assume that the primary earner decides whether to participate, and that the secondary earner only considers whether to participate if the primary earner has already decided to participate. The combined return permits a comparison of a mandate applying to both primary and secondary earners with current law.

We first report calculations assuming population average mortality using Social Security Administration life tables for the 1949 birth cohort. We then allow mortality to vary with race/ethnicity and educational attainment. We do not consider a possible "broken heart" relationship between the mortality of married couples (Frees, Carriere, and Valdez, 1996). In each case, we assume the primary earner is male and the secondary earner is female and that both earners are the same age. We consider earnings combinations of high-high, high-medium, high-low, medium-medium, and medium-low for the primary and secondary earner. Unreported results where the primary earner is female are similar, notwithstanding differences in assumed mortality.

The key findings are 1) the internal rate of return (IRR) on Catch-Up contributions is almost always positive for single men and higher for single women than for single men with the same income, reflecting women's greater longevity, 2) the IRR is substantially higher for primary earners than single individuals of the same gender, and 3) the IRR can be negative for

secondary earners who are either eligible for spousal benefits or who are on the 15 percent segment of the PIA formula.

To illustrate, high earning single men with population average mortality earn 0.1 percent a year, compared with 4.2 percent for medium and low earners, reflecting the high earners' location on the 15 percent segment of the PIA formula. But the IRR for primary earners, regardless of earnings, exceeds the one percent currently obtainable on Treasury Inflation Protected Securities.[5] High earning men married to high earning women earn 1.9 percent, reflecting the impact of the husband's Catch-Up contributions on the wife's survivor benefit, and high earning men married to low earning women earn 3.1 percent, reflecting the impact of the husband's Catch-Up contributions on both the wife's survivor and spousal benefits.

When the woman is the secondary earner, her rate of return is less than that of a single woman with the same lifetime earnings. Medium earner and low earner women married to high earner men earn 2.5 percent and minus 10.5 percent a year compared with 5.0 and 5.1 percent for their single counterparts, reflecting the displacement of her retired worker benefit by survivor benefit in the former case and both survivor and spousal benefit in the latter case.

Socioeconomic status explains mortality differences more than do gender differences in mortality (Sanzenbacher, Webb, Cosgrove, & Orlova, 2018). Using the relative mortality factors for socioeconomic groups estimated by Brown, Liebman, and Pollet (2002), we test the sensitivity of our rate of return calculations to alternative mortality assumptions. The exercise is for illustrative purposes only; we acknowledge that mortality is correlated with income even after conditioning on education and race, and that some combinations of income and mortality, for example a high earner with less than a high school education will occur only infrequently.

The Brown, Liebman, and Pollet (2002) calculations are based on National Longitudinal Mortality Study data from 1975-1989 and are the most recent estimates of relative annual mortality rates by age. They are representative of individuals alive in the above period, not of a particular birth cohort. A potential concern is that socioeconomic mortality differences may have widened in recent years (Sasson, 2016), with part of the increase reflecting the changing composition of high-school dropouts (Sanzenbacher, Webb, Cosgrove, & Orlova, 2018). Our analysis of the Brown, Liebman, and Pollet (2002) data shows a life expectancy gap of just over 13 years between Black men with less than a high school education and White men with some college-level education, conditional on surviving to age 25. In contrast, Sasson (2016) reported a 2010 gap of just under 12 years between Black high school dropouts and Whites who completed college and Sanzenbacher, Webb, Cosgrove, and Orlova (2018) a 7.3 year gap between men in the top and bottom quartiles of educational attainment. We therefore regard our estimates as likely representing an upper bound to the effect of socioeconomic mortality differentials on rates of return.

The key finding is that with rare exceptions, single men and women, and men (and women) who are the primary earner, still enjoy positive real rates of return even after adjusting for socioeconomic mortality differentials, although the relationship between lifetime income and rate of return is somewhat weakened. For example, the return enjoyed by a high earner man married to a medium earner woman increases from 2.0 to 2.2 percent when they are both given the mortality of college educated Whites, and the return enjoyed by a medium earner man married to a low earner woman decreases from 5.9 to 4.9 percent when they are both given the mortality of Blacks with less than a high school education.

Equivalent Contribution Rate

We calculated what we term the "equivalent contribution rate" (ECR), the contribution rate at which households are indifferent between participating and not participating (Table 3). When the ECR exceeds 3.1 percent, the household is better off participating. We report results for single men and women, married couples in which only the primary earner (which we assume to be the husband) participates, the marginal value of the contributions of the secondary earner (which we assume to be the wife), and the ECR when both contribute. The last metric is particularly relevant when comparing a Catch-Up mandate with an opt-out design. We do not report results by race/ethnicity and educational attainment as ECR is little affected by relative mortality risk, consistent with Brown (2002) calculations of annuity equivalent wealth.

The key finding is that ECR is higher for primary earners than for single individuals and always exceeds 3.1 percent of pay, often by substantial margins, irrespective of the assumed coefficient of risk aversion or assumed rate of return on financial assets. In contrast, whether the program in beneficial to the secondary earner is sensitive to the primary earner's and the secondary earner's earnings, the assumed coefficient of risk aversion, and the assumed rate of return on financial assets. The ECR of the secondary earner is sometimes, but not always above the 3.1 percent threshold at which participation is optimal. Viewed at the household level, the ECR almost always exceeds 3.1 percent, sometimes by substantial margins.

To illustrate, assuming a coefficient of risk aversion of five and a rate of return on financial assets of three percent, the ECRs for high, medium, and low earner single men are 3.8, 7.4, and 6.5 percent, respectively. The lower ECR for the high earner reflects their location on the 15 percent segment of the PIA formula. Although the medium and low earners earn similar rates of return, the medium earner has a higher ECR, reflecting their smaller share of pre-annuitized wealth and our assumption of a CRRA utility function. But high earners married to

high, medium, or low earners have ECRs of 4.1, 4.1, and 4.9 percent, compared with 3.8 percent for the equivalent single man. Medium earners married to medium or low earners have ECRs of 8.3 and 8.0 percent, compared with 7.4 percent for the equivalent single man.

Alternative assumptions regarding the coefficient of risk aversion and rate of return on financial assets have predictable effects. A reduction in the coefficient of risk aversion from five to two reduces the ECR of married men by 0.6 to 1.3 percent of pay (assuming a 3 percent rate of return). A reduction in the real interest rate on financial assets from 3 to one percent increases the ECR by 2.3 to 4.5 percent of pay (assuming a coefficient of risk aversion of five).

Participation is optimal for risk-averse secondary earners, regardless of absolute or relative earnings, the one exception is high earners under an assumption of a three percent real return on financial assets. Whether it is optimal for risk-tolerant secondary earners is more sensitive to assumptions regarding absolute and relative earnings and the rate of return on financial assets. For example, a low earner married to a high earner has an ECR of only 0.8 percent when the coefficient of risk aversion is two and the rate of return three percent.

When viewed at the household level, participation is almost always optimal, the one exception being risk tolerant couples with two high earning spouses, where the ECR is 2.7 percent. Thus, if the alternative to the status quo is a mandate, almost all households would benefit, sometimes by substantial amounts.

Comparing Catch-Up contributions with 401(k) savings

The above analysis compares the Catch-Up program with the optimal accumulation and drawdown of financial assets. An optimal accumulation is a theoretical construct not based in practice; most households use rules of thumb (Sun & Webb, 2013) and would therefore find the Catch-Up program even more valuable. However, the analysis excludes the option of

accumulating financial assets from age 50 to 66 and then purchasing an inflation-indexed annuity from an insurance company. We now consider this latter option. We identify two factors that make the individual annuity approach expensive and economically inefficient. First, the individual annuity market suffers from adverse selection that contributes to prices being considerably less than actuarially fair to purchasers with population average morality (Mitchell, Poterba, Warshawsky, & Brown, 1999). Second, workers who purchase an annuity at retirement also forego pre-retirement mortality credits – in the event of death before retirement, their accumulated wealth passes as a possibly unintended bequest rather than being used to increase the benefits of those who survive. But the accumulation of financial assets may still provide higher post-retirement income if the rate of return on financial assets is sufficiently higher than that on Catch-Up contributions.

We assume workers earn a 3 percent real return on their financial wealth, the standard assumption in the literature, and an alternative in which participants earn a one percent return, in line with current returns on Treasury Inflation Protected Securities. Of course, workers could earn higher expected returns in the stock market, but as with Catch-Up contributions, inflation indexed annuities substitute for bonds in the household's portfolio.

We assume current annuity rates and an alternative in which insurers price annuities using a 3 percent real interest rate, holding current sales loads constant. Specifically, we use current market annuity rates, back out a level of actuarial unfairness assuming projected annuitant mortality (we use the Individual Annuity 2012 mortality table and Projection Scale G), and re-price the annuity assuming that level of actuarial unfairness and a 3 percent real interest rate.

We report results for primary earners married to lower earning secondary earners where the earnings of the secondary earner are not so low as to create an entitlement to spousal benefits (Table 4). Catch-Up contributions increase the primary earner's retired worker benefit and the secondary earner's spousal benefit, so the analogous commercial product is a joint-life and 100 percent survivor inflation indexed annuity. We do not report results for secondary earners or primary earners married to secondary earners with very low relative earnings because the individual annuity market does not offer competing products. For example, it is not possible to purchase an inflation-indexed annuity with benefits that cease on the first death of two named individuals.

Commercial annuities are relatively more attractive to higher earners, reflecting the progressivity of the Social Security benefit formula, and at higher assumed rates of return. But in all four cases studied, Catch-Up contributions provide larger benefits than commercial annuities, often by substantial margins. Consider a medium earner earning a one percent return. The medium earner would have accumulated $20,400 at age 66, which would buy an annuity of $66 a month, only 25 percent of their Catch-Up benefits. At a three percent return, a high earner would have accumulated $33,400, which would buy an annuity of $168 a month, still short of the $175 a month provided by Catch-Up contributions.

DISCUSSION

Comparing Catch-Up to allowing Social Security to sell annuities

Comparisons of calculations of actuarial unfairness using annuitant and population mortality tables indicates that the actuarial unfairness of annuities to people with population mortality mostly reflects the lower mortality of people who actually buy them rather the effects

of profits, fees, and sales commissions (Mitchell, Poterba, Warshawsky, & Brown, 1999, James & Song, 2001).

The only other proposal to purchase more Social Security benefits we know of is Munnell (2013) who proposed individuals be allowed to purchase an annuity up to $250,000 from Social Security. We believe Munnell's proposed product would attract a similar demographic to those who currently buy annuities from insurance companies and would suffer from similar levels of adverse selection. Unless prices were set close to those charged by commercial insurers, thereby offering little additional benefit, the product would drain the Social Security Trust Fund, to benefit those at least somewhat prepared for retirement. The proposal would not benefit those most in need of additional income, who arrive at retirement with only Social Security. In contrast to the proposed Catch-Up program, which uses the progressivity of the Social Security benefit formula to target low lifetime earners, both rich and poor would face the same annuity rates under the Munnell proposal.

Why A Mandate May be Beneficial

A mandate offers two advantages. First, it extends coverage to those who would be better off participating but would, in the absence of a mandate, choose to opt out. A mandate might therefore be justified on social policy grounds and within social insurance principles. Second, it may eliminate adverse selection and enable all participants to benefit from more favorable terms. But a mandate entails two costs. First, political costs, and second, harms to those who would rationally choose not to participate even on the more favorable terms made possible by a mandate. Policymakers must evaluate and trade-off these costs and benefits.

Considering first the benefits of a mandate, although some believe defaults achieve acceptable levels of participation in 401(k) plans (Belbase & Sanzenbacher, 2017; Choi,

Laibson, Madrian, & Metrick, 2001; Clark, Utkus, & Young, 2015; Madrian & Shea, 2001), a default is unlikely to achieve universal coverage among those who would most benefit, reflecting time inconsistent behavior (Laibson, 1997) among other factors. Those least likely to participate may suffer the greatest loss of utility.

A mandate would protect the Catch-Up program from adverse selection. We identify four potential sources of adverse selection. First, adverse selection occurs because high earners live longer than low earners and will receive Catch-Up benefits for more years. But participation by high earners aids the program because high earners cross-subsidize low earners because of the program's progressivity. Second, high earners may opt-out. But our calculations show that the program is attractive to this group. Third, adverse selection may occur on the basis of lifetime earnings, with workers whose catch-up years will not be among the highest 35 wage-indexed years opting out. This form of adverse selection appears unlikely. In our model, earnings past age 50 count as part of the top 35 years for all except low lifetime earners and then only at advanced ages. Using stylized earners overstate the potential problem: the model does not include years with zero earnings and earnings declines partially reflect older workers exiting the labor force who would no longer be able to participate. The fourth and, to our mind most significant risk, is low-earning spouses opting out of the Catch-Up program because they earn low or negative returns. But, as we said before, this is a shrinking group.

A mandated social insurance program always raises the possibility of two costs: the political cost of a mandate being perceived as a tax increase rather than as a payment for future benefits and that low earners would be better off with current contributions and benefits. Pang and Schieber (2014) argue that with the mortgage paid off and child rearing expenses ending, low earners do not need more than current Social Security benefits to maintain their pre-

retirement standard of living and that mandated savings would force low earners to "over-save" (shifting consumption from younger ages when the marginal utility of consumption is high to older ages when, the authors claim it is lower). We acknowledge the theoretical possibility; it requires extreme assumptions regarding household preferences for the risk to be significant and an heroic view of low earners living on 80-90 percent of their already low earnings in retirement (Munnell, Rutledge, & Webb, 2014).[6]

Why 3.1 percent

A higher contribution rate would yield proportionately larger benefits, but a higher rate might increase the crowd-out of other savings and without a mandate might increase the share of workers opting out. The United States Social Security system is mostly PAYGO and a higher contribution rate would result in the accumulation of significant Trust Fund reserves, changing the character of the program. Given our assumed constant relative e\risk aversion utility function, the marginal value of annuitization decreases as the share of annuitized wealth increases. The incremental ECR over the range 3.1 percent to a 6.2 percent contribution rate will be less than over the range of zero to 3.1 percent. Risk-tolerant high earners may be unwilling to participate at a 6.2 percent rate, risking adverse selection unless participation was mandated.

Catch-Up Proposals and the Modern Family

The spousal benefit results in higher replacement rates to one-earner families and has been criticized by feminist economists (Meyer, 1996) for favoring traditional families. Nonetheless, the system has adjusted as families change, with retired worker benefits gaining importance relative to survivor and spousal benefits.. Reflecting the change in family structure and husband and wife earning patterns is the 39 percent fall in the number of women getting spousal benefits. Although Catch-Up contributions build upon the existing structure of Social

Security, they fit more naturally in a system in which benefits mostly reflect the worker's own contributions.

We note several proposals for redesigning Social Security to fit the needs of the modern family (Faverault & Steurle, 2008; Munnell & Eschtruth, 2018). The policy difficulty is that additional benefits for some must be paid for by benefit cuts and/or tax increases. Catch-Up contributions expand Social Security benefits and thus make it possible to modernize the program while preserving existing benefit levels.

Impact on Poverty

Thus far, our study of the Catch-Up proposal is a retrospective analysis of how workers currently entering retirement would have fared. Due to the limits of computational feasibility, our model does not capture the rich variety of demographic and economic events households experience over their lifetimes. A benefit of winning the AARP innovation grant is the Urban Institute simulating the program's impact on succeeding birth cohorts using the DYNASIM microsimulation model (Faverault, Smith, & Johnson, 2015). Researchers use the DYNASIM model to simulate the distributional effects of policy interventions.

The DYNASIM model incorporates program interactions including eligibility for Supplementary Security Income and Medicaid, and a rich variety of behavioral responses. The DYNASIM model is parameterized using data from the Survey of Income and Program Participation. The model "ages" the data year by year, simulating births, deaths, marriages and divorces, labor force participation, earnings, hours of work, disability onset, retirement, simulates Social Security coverage and benefits; calculates Supplementary Security Income eligibility, participation, and benefits.

The Urban Institute ran four sets of simulations on our behalf, assuming (1) a 50 percent increase in contributions starting at age 50, (2) a 30 percent increase at age 40, (3) that current law benefits would continue to be paid, and (4) that on exhaustion of the Social Security Trust Fund, benefits would be reduced to an amount that equaled current payroll tax receipts. We assumed a Catch-Up participation rate of 100 percent and zero crowd-out of retirement and nonretirement savings. Crowd-out would be zero among those currently saving nothing for retirement, and we hypothesized that the 401(k) contributions of other households would be influenced by social norms and the desire to earn an employer match, rather than by a desire to smooth the marginal utility of consumption, so that 401(k) contribution rates might change slowly, if at all.

Catch-Up reduces overall poverty by 1.8 percentage points in 2065. The greatest reduction, 4.5 percentage points, is among the working poor, those in the second lifetime earnings quintile. The 2.5 percentage point reduction in poverty is somewhat less for households in the bottom quintile because they are less attached to the labor force and experience much smaller increases in benefits. The percentage point reduction in poverty is slightly greater for women than for men (Ghilarducci, Papadopoulos Sun, & Webb, 2018).

Impact on the Trust Fund

Shoring up Social Security's finances is a precondition for this Catch-Up proposal to work otherwise participants may be deterred by uncertainty as to the return they will obtain on their contributions (Brown, Casey, & Mitchell, 2007). Over a 25-year horizon, the reform would narrow the actuarial shortfall from 1.45 percent to 0.93 percent of payroll, reflecting additional payroll tax receipts that would not be matched by additional benefit payments (Table 6). Over a 75-year horizon, the reform would be almost exactly actuarially neutral, increasing the shortfall

from 2.82 to 2.83 percent of payroll. Thus, the program would not contribute to bridging the actuarial shortfall, but this was not its objective, and other policy instruments are available for that purpose. However, the DYNASIM simulations indicate that the program would postpone exhaustion of the Trust Fund from 2034 to 2037, reflecting increased payroll tax receipts.

Last, are political considerations concerning the interaction between the Catch-Up proposal and proposals for eliminating the Social Security actuarial shortfall by cutting benefits and or increasing revenue. A common proposal is to increase the Full Retirement Age (FRA). An increase in the FRA is equivalent to an across-the-board benefit cut for low-and high earners alike. But the increase in the FRA may push low earners into poverty in retirement (Reznik, Couch, Tamborini, & Iams, 2018). Even if the health and job-prospects of these groups permit delayed retirement, delay would reduce the expected present value of their lifetime benefits due to their lower than average longevity. So proposals to increase the FRA are sometimes accompanied by proposals to increase the progressivity of the system (National Commission on Fiscal Responsibility and Reform, 2011). Increases in progressivity jeopardize the success of Catch-Up because they reduce the returns to higher earners, while the debate introduces uncertainty as to the "rules of the game" that further jeopardize success. Programs for the poor are often characterized as poor programs, and are also programs in which the better-off will not participate voluntarily.

The U.S. will need to expand advance-funded retirement plans

While acknowledging no single retirement system is optimal for all nations, Barr and Diamond (2009) argue a mixture of PAYGO and advance funded plans (featuring universal coverage and annuity payouts) is key to efficiency, equity, and stability. Though presenting the ideal retirement system for the U.S. is beyond the scope of this study, we consider that Catch-Up

contributions should be accompanied by expanding and reforming advance-funded occupational retirement plans.

CONCLUSION

The United States faces a severe and imminent retirement savings crisis. Almost half of older middle-class workers will be de-facto poor at age 65 (Ghilarducci, Papadopoulos & Webb, 2018) and the U.S. has among the highest elder poverty rates in the OECD (2016). The policy debate has focused on working longer, saving more, and cutting Social Security benefits to restore long-run solvency. Working longer is neither a feasible nor an equitable solution for those most at risk of downward mobility in retirement. Saving more would ease the crisis. But those most at risk often lack access to workplace retirement savings plans, and the 401(k) system, characterized by high fees, leakages, and difficulty of converting accumulated wealth into lifetime income, is ill-designed to help them.

This study evaluates a proposal for a Social Security Catch-Up program – a winner of the AARP 2016 “Innovation Challenge” contest. We conclude that for plausible beliefs and preference parameters, risk-averse households facing an uncertain lifespan will value the program at greater than the required contribution rate, and will also prefer it to purchasing a commercial annuity. The program will not solve the retirement savings crisis. But it will narrow the gap between needs and resources.

An obvious concern is that those who would derive the most benefit might opt out of the program. Although well-crafted defaults have been shown to achieve high participation rates in 401(k) plans, we do not know whether they would be similarly effective with Catch-Up contributions. If defaults fail to work, participation could be mandated. We see little evidence

that workers would be harmed by a mandate, and a mandate would be within the social insurance tradition.

This study contributes to the political debate about how to close the Social Security actuarial shortfall. This debate is framed in terms of payroll tax increases versus benefit cuts, with a presumption that higher earners prefer benefit cuts, by reason of their lower return on contributions, and lower earners favoring tax increases. However, we show that, at the margin, workers in all income groups, benefit from paying higher FICA taxes in return for more Social Security benefits.

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Table 1
Proposed Impact of Catch-Up Contributions in Benefits for Singles and Couples

Singles			
Earnings	High	Medium	Low
Existing monthly benefits	$2,019	$1,519	$924
Existing replacement rate	37.1%	44.8%	60.4%
Additional Benefits	$175	$226	$105
Benefits with Catch-Up contributions	$2,193	$1,745	$1,029
Increase in replacement rate	3.2%	6.7%	6.8%
Replacement rate after Catch-Up	40.3%	51.5%	67.2%

Couples					
Earnings of primary earner	High	High	High	Medium	Medium
Earnings of secondary earner	High	Medium	Low	Medium	Low
Existing monthly benefits of couple	$4,037	$3,537	$3,028	$3,027	$2,443
Existing replacement rate	37.1%	40.1%	43.4%	44.8%	49.7%
Additional benefits from:					
Catch up contributions of primary earner	$175	$175	$262	$226	$226
Catch up benefits of secondary earner	$175	$226	$0	$226	$105
Total	$350	$401	$262	$452	$331
Benefits with self and spouse Catch-Up	$4,387	$3,938	$3,290	$3,490	$2,774
Addition to replacement rate from:					
Catch up contributions of primary earner	1.6%	2.0%	3.8%	3.3%	4.6%
Catch up benefits of secondary earner	1.6%	2.5%	0.0%	3.3%	2.1%
Total	3.2%	4.5%	3.8%	6.7%	6.7%
Replacement rate with self and spouse Catch-Up	40.3%	44.6%	47.2%	51.5%	56.4%

Source: Authors' calculations
Note: 1949 birth cohort. Population average mortality. Scaled high, medium, and low earners.

Table 2
Projected Rate of Return on Catch-Up Contributions, Singles and Couples

	Single men			Single women	
Lifetime earnings	High	Medium	Low	Medium	Low
All	0.1%	4.2%	4.2%	5.0%	5.1%
White less than high school	-0.4%	3.6%	3.7%	4.7%	4.8%
White high school	0.1%	4.2%	4.2%	5.1%	5.1%
White some college	0.6%	4.7%	4.7%	5.3%	5.4%
Black less than high school	-1.3%	2.7%	2.7%	4.0%	4.1%
Black high school and college	-0.7%	3.3%	3.4%	4.6%	4.6%
Hispanic	0.7%	4.8%	4.8%	5.3%	5.4%
	Only husband makes catch up contributions				
Husband earnings	High	High	High	Medium	Medium
Wife earnings	High	Medium	Low	Medium	Low
All	1.9%	2.0%	3.1%	5.8%	5.9%
White less than high school	1.6%	1.7%	2.7%	5.5%	5.6%
White high school	1.9%	2.0%	3.1%	5.8%	5.9%
White some college	2.2%	2.2%	3.5%	6.1%	6.1%
Black less than high school	1.0%	1.0%	1.8%	4.8%	4.9%
Black high school and college	1.5%	1.6%	2.5%	5.4%	5.5%
Hispanic	2.2%	2.2%	3.5%	6.1%	6.1%
	Marginal return on wife's catch up contributions				
Husband earnings	High	High	High	Medium	Medium
Wife earnings	High	Medium	Low	Medium	Low
All	-1.3%	2.5%	-10.5%	3.0%	2.3%
White less than high school	-1.9%	1.7%	-10.5%	2.4%	1.4%
White high school	-1.3%	2.5%	-11.0%	3.0%	2.4%
White some college	-0.7%	3.3%	-11.6%	3.6%	3.3%
Black less than high school	-2.3%	0.7%	-6.7%	1.8%	0.0%
Black high school and college	-1.9%	1.3%	-8.8%	2.3%	0.9%
Hispanic	-0.3%	3.5%	-7.3%	3.9%	3.3%
	Husband and wife make catch up contributions				
Husband earnings	High	High	High	Medium	Medium
Wife earnings	High	Medium	Low	Medium	Low
All	0.6%	2.1%	1.8%	4.6%	5.0%
White less than high school	0.2%	1.7%	1.4%	4.2%	4.6%
White high school	0.6%	2.2%	1.8%	4.6%	5.0%
White some college	1.0%	2.6%	2.2%	5.0%	5.4%
Black less than high school	-0.5%	0.9%	0.6%	3.4%	3.7%
Black high school and college	0.1%	1.5%	1.2%	4.0%	4.4%
Hispanic	1.1%	2.7%	2.2%	5.1%	5.4%

Source: Authors' calculations
Note: 1949 birth cohort. Population average mortality. Scaled high, medium, and low earners

Table 3
Projected Equivalent Contribution Rate by Lifetime Earnings

	Single men			Single women	
	High	Medium	Low	Medium	Low
			Rate of return = 3%		
CRRA = 2	3.1%	6.1%	5.6%	6.7%	6.2%
CRRA = 5	3.8%	7.4%	6.5%	7.9%	7.0%
			Rate of return = 1%		
CRAR = 2	4.1%	7.8%	6.6%	8.7%	7.5%
CRRA = 5	5.5%	10.2%	8.5%	11.2%	9.5%
	Only husband makes catch up contributions				
Husband earnings	High	High	High	Medium	Medium
Wife earnings	High	Medium	Low	Medium	Low
			Rate of return = 3%		
CRRA = 2	3.5%	3.4%	4.1%	7.1%	6.7%
CRRA = 5	4.1%	4.1%	4.9%	8.3%	8.0%
			Rate of return = 1%		
CRAR = 2	5.0%	4.8%	5.6%	9.9%	9.0%
CRRA = 5	6.5%	6.4%	7.2%	12.8%	11.7%
	Marginal benefit of wife's contributions				
Husband earnings	High	High	High	Medium	Medium
Wife earnings	High	Medium	Low	Medium	Low
			Rate of return = 3%		
CRRA = 2	1.9%	3.8%	0.8%	4.0%	3.4%
CRRA = 5	2.5%	5.3%	4.8%	4.9%	4.7%
			Rate of return = 1%		
CRAR = 2	2.6%	4.9%	0.9%	5.1%	4.2%
CRRA = 5	3.4%	7.3%	5.9%	6.6%	6.0%
	Husband and wife make catch up contributions				
Husband earnings	High	High	High	Medium	Medium
Wife earnings	High	Medium	Low	Medium	Low
			Rate of return = 3%		
CRRA = 2	2.7%	3.6%	3.2%	5.5%	5.5%
CRRA = 5	3.2%	4.8%	4.9%	6.4%	6.0%
			Rate of return = 1%		
CRAR = 2	3.7%	4.9%	4.2%	7.4%	7.2%
CRRA = 5	4.8%	6.9%	6.4%	9.3%	8.3%

Source: Authors' calculations
Note: 1949 birth cohort. Population average mortality. Scaled high, medium, and low earners.

Table 4
Comparison of Catch-Up with Commercial Annuities

	Medium earner	High earner
Monthly benefit	$262	$175
Catch-Up Contributions		
Commercial Annuities		
1% return accumulation and annuity priced using 1% returns	$66	$108
3% return accumulation and annuity priced using 3% returns	$102	$168

Source: Authors' calculations.

Note: see text for details.

Table 5
Benefits by Type of Family

	1991	2017	Percent Change
Male surviving spouse	33,029	101,608	208%
Female surviving spouse	4,866,411	3,420,395	-30%
Male retired worker with spousal benefit	2,910,901	2,069,086	-29%
Female retired worker with spousal benefit	28,743	133,449	364%
Female receiving a surviving spousal benefit	4,820,943	3,382,438	-39%

Source: Calculated from the SSA website accessed Dec. 8, 2018. https://www.ssa.gov/oact/ProgData/famben.html

Table 6
Projected Impact of Reform on Social Security Actuarial Balance

	Valuation Period		
	25 years	50 years	75 years
		Current law	
Income rate	14.59%	13.99%	13.85%
Cost rate	16.04%	16.32%	16.67%
Actuarial deficit	–1.45%	–2.34%	–2.82%
		Proposal	
Income rate	15.62%	15.08%	14.98%
Cost rate	16.55%	17.25%	17.80%
Actuarial deficit	–0.93%	–2.17%	–2.83%
Change in actuarial deficit	–0.52%	–0.17%	0.01%

Source: Authors' calculations.

Endnotes

[1] We note two additional interactions. First, the Social Security earnings test reduces the retired worker, spousal, and survivor benefits of claimants who have not yet attained their FRA at a 2018 rate of a $1 dollar reduction in benefits for each $2 that earnings exceed $17,040. Second, surviving spouses who claim survivor benefit can later claim a retired worker benefit based on their own record, without any actuarial reduction. Depending on labor market earnings, mortality beliefs, and the relative amounts of the survivor and retired worker benefit, the optimal strategy for some surviving spouses may be to claim survivor benefit as early as possible and to switch to retired worker benefit as late as possible.

[2] An analysis of couples in which one spouse did not work for pay would have to consider whether that spouse would enter the labor market in the event of the death of their spouse prior to age 60. If the spouse was assumed not to re-enter the labor market, the household would save implausibly large shares of income at young ages to guard against the risk of almost zero income and a correspondingly high marginal utility of consumption.

[3] Results for maximum and very low earners and households in which the wife is the primary earner are available from the authors on request.

[4] This involves calculating an optimal strategy in period T, assumed to be age 100, calculating the utility of that strategy, and working back to age 62, calculating the strategy in each preceding period under the assumption that the household adopts the optimal strategy from that period onwards. The optimal strategy for each period is calculated for all feasible wealth values and all feasible Social Security retired worker, spousal, and survivor benefits.

[5] On 19 November 2018, the yield on 10-year TIPS was 1.06 percent. https://fred.stlouisfed.org/series/DFII10

[6] Specifically, it requires some combination of low earnings, high equivalence scales for children, a large mortgage, a high intertemporal elasticity of substitution, high mortality, and low post-retirement health care cost.