

The Retirement Solution Hiding in Plain Sight:

How Much Retirees Would Gain by Improving Social Security Decisions

Matt Fellowes, *United Income, former Fellow at the Brookings Institution*

Jason J. Fichtner, *Johns Hopkins University, former Chief Economist at the Social Security Administration*

Lincoln Plews, *United Income*

Kevin Whitman, *former Policy Research Director at the Social Security Administration*

Social Security now accounts for about one-third of all income annually received by U.S. retirees, amounting to \$1 trillion in annual benefits. While impactful, research consistently finds that the financial effect of Social Security could be even greater if more people waited to enroll, since monthly benefits can increase in value if retirees delay claiming. But, we don't know how much is annually lost from households making the sub-optimal decision about when to claim Social Security, how many are making mistakes, or who is making those wrong decisions. To explore these questions, we utilize new technology invented by United Income and data sponsored by the Social Security Administration, finding:

Retirees will collectively lose \$3.4 trillion in potential income that they could spend during their retirement because they claimed Social Security at a financially sub-optimal time, or an average of \$111,000 per household. The average Social Security recipient would receive 9 percent more income in retirement if they made the financially optimal decision about when to claim this retirement benefit.

Current retirees will collectively lose an estimated \$2.1 trillion in wealth because they made the sub-optimal decision about when to claim Social Security, or an average of \$68,000 per household. Most retirees will lose wealth in their 60s and early 70s if they choose to optimize Social Security, but will be wealthier in their late 70s through the rest of their lives.

Only 4 percent of retirees make the financially optimal decision about when to claim Social Security. About 57 percent of retirees would build more wealth through their life if they waited to claim until they were 70 years old (when only 4 percent of retirees currently claim), while only 6.5 percent of retirees would have more wealth if they claimed prior to turning 64 (when over 70 percent of retirees currently claim benefits).

About 21 percent of those at risk of not affording retirement (or having enough income to cover their expected cost of living) would see an improvement in their chances if they claimed Social Security at the optimal time. Among those retirees at risk that start with a greater than 10 percent chance of affording retirement, 95 percent see their chances of affording retirement improve by an average of 28 percent.

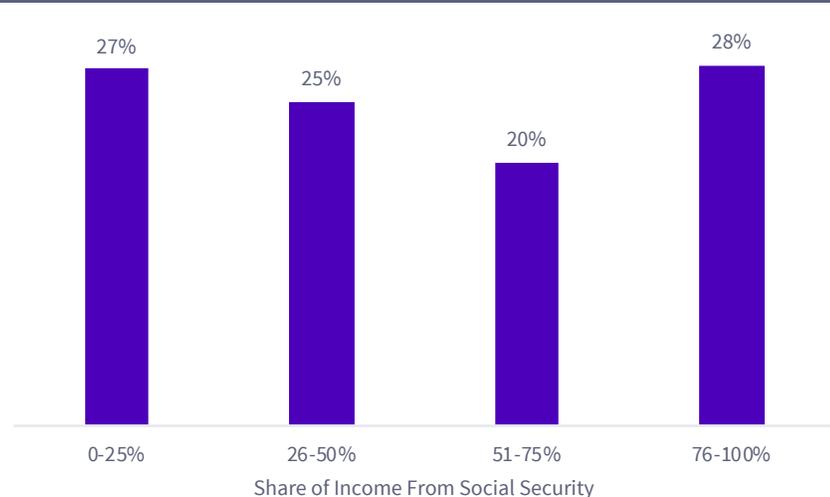
Elderly poverty could be cut by nearly 50 percent if all retirees claimed Social Security at the financially optimal time. In particular, about 13 percent of people over the age of 70 are expected to live in poverty at some point, which is estimated to fall to 7 percent if retirees had claimed Social Security at the optimal time – a rate that could potentially fall even further if they earned additional income while they waited to claim Social Security.

This report finds that nearly no retirees are making the financially optimal decision about Social Security, and that the costs of those mistakes are high for retiring households, particularly those at risk of not being able to afford retirement. In addition, since making the optimal decision means sacrificing wealth in the near-term, we think it is unlikely more people will make the right decision without a policy intervention. There are numerous difficulties associated with solving this problem, though, which will require a thorough and diverse process for addressing. Among the topics for consideration should be the eligibility age range rules, which were last materially modified in 1983. Since 92 percent of retirees are expected to be better off waiting to claim until at least their 65th birthday, claiming before should ideally be an exception for those who demonstrably need to claim benefits before the full retirement age. Means-testing rules may be one way to address this, though an easier place to start would be to change how the Social Security Administration frames claiming age options to the public. Instead of portraying age 62 as the “early eligibility age,” for instance, claiming at age 62 could instead be labeled as the “minimum benefit age” while age 70 could be labeled as the “maximum benefit age.” The Social Security Administration could also be provided with resources to improve utilization of the policy it administers, perhaps in partnership with third-party fiduciaries. With the potential to put \$2.1 trillion wealth and \$3.4 trillion in income in the pockets of retirees, policymakers should be focused on improving this program.

Introduction

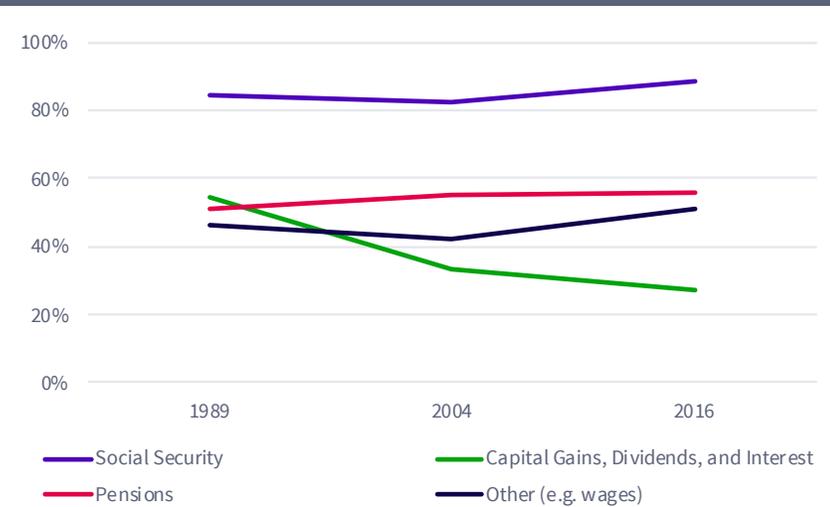
The Social Security Administration now pays over \$1 trillion in benefits to more than 65 million people annually, or about nine out of every ten retirees.¹ Now accounting for about one-third of all income annually earned by U.S. retirees, these retirement-focused benefits are fundamental to the financial security of most retirees.² As one sign of that, about 50 percent of current retirees report that more than half of their annual income comes from Social Security, while a third report that more than 90 percent of their income comes from these benefits.³

FIGURE 1. Share of Retirees Dependent on Social Security, by Magnitude



Source: Authors' Analysis of Data from Federal Reserve Board of Governors

FIGURE 2. Share of Retirees with Income, by Income Type



Source: Authors' Analysis of Data from Federal Reserve Board of Governors

As broad as Social Security's impact is on retirees today, academic research has consistently found that it could be even greater.⁴ That is because most U.S. adults claim Social Security by the time they turn 63, even though their monthly Social Security income would be higher if they waited to claim it later.⁵ While some are served well by claiming Social Security early, such as those that expect to live relatively short lives or the spouses of breadwinners, economists have found that many retirees can maximize the amount of income they have in retirement by delaying their decision to claim Social Security benefits.⁶

But, no one has determined how many retirees actually make the wrong financial decision about when to claim Social Security or how much money is lost by U.S. households because of it. Similarly, we don't know who is making these wrong decisions. For instance, it could be wealthy households that would not stand to gain relatively much by optimizing this decision. Alternatively, it could be less affluent households that would have a much better chance of affording retirement if they made better decisions about when to claim Social Security.

At the same time, there are critical limitations in the existing academic work. Much of it has been theoretical, which means the data about households used in the analyses has been made-up to analyze different scenarios.⁷ Similarly, much existing work has artificially narrowed the analysis to focus only on maximizing the (net-present)

value of Social Security benefits, while ignoring the trade-offs most U.S. retirees face between claiming Social Security or withdrawing from investment accounts.⁸ And, economists that do take this household reality into account have tended to only consider a single future market scenario for investment

accounts (e.g., equity markets increase in value every year by the same amount) or have ignored other interdependencies, such as how spending varies across different households.⁹

With the new technology that United Income has invented, we can now begin to answer these overlooked questions, while also addressing the limitations of past academic work. To do that, we analyze the actual Social Security decision and wealth accumulation of 2,024 households in a Social Security Administration sponsored panel survey.¹⁰ This survey provides in-depth information about an individual's decision about when they claim Social Security, along with their health, longevity, spending, investment accounts, and other relevant information about this decision. Using these data, we can determine how many people are making sub-optimal decisions about Social Security and how those mistakes vary across different wealth levels, educational backgrounds, and health and longevity profiles. We then use United Income's proprietary wealth and longevity forecasting technology to simulate how much these households would have been worth through their retirement, and how much extra income they could have made, if they had made the optimal decision about Social Security.

Methodology

This section reviews the panel data, simulation, and optimization methodology, along with the steps that we took to validate the representativeness of the sample data and the proprietary algorithms in the United Income software.

Panel Data

The primary data source for our analysis is the University of Michigan's Health and Retirement Study (HRS), which is a biannual panel survey made up of approximately 20,000 Americans, following them from age 50 through the end of their lives.¹¹ The survey is funded by the National Institute on Aging and the Social Security Administration. We supplement these data with proprietary data sources used to build personalized longevity estimates for each adult in a household, along with individualized spending projections for major budget categories, like health, discretionary, and non-discretionary spending.

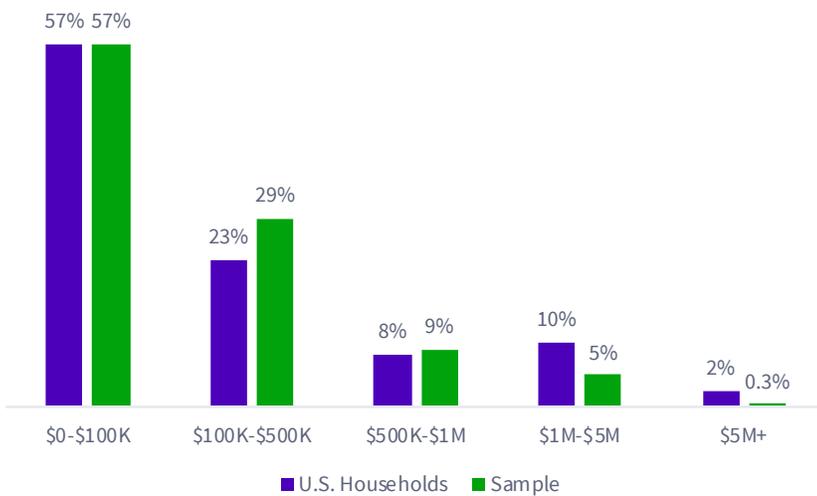
In our analysis of the HRS data, we considered approximately 2,000 households that were observed for a minimum of three panels (or 3 different time periods), between 1992 and 2014. This sample of data included respondents that reported both their Social Security claim age and the retirement date for every adult in the household. Households also needed to be observed in the survey prior to their 62nd birthday so that we could simulate every possible Social Security claim option.¹² In addition, we dropped households that claimed Disability Insurance because the administrators of the survey did not distinguish between old age insurance income and disability insurance in earlier waves of the HRS survey. This made it impossible to distinguish whether those households had made the optimal decision. Finally, we dropped households that were widowed before claiming Social Security because the gains from delaying widower benefits are different than those of individual Social Security benefits, making them exceptional cases.

For each of the observed households, we considered numerous additional characteristics, including the different types of financial accounts and the change in balances over the observed time period, the self-reported health of the respondents, their income, educational attainment, gender, and other socio-economic information. These data were used in proprietary longevity, spending, and wealth forecasting models.

Panel Representativeness

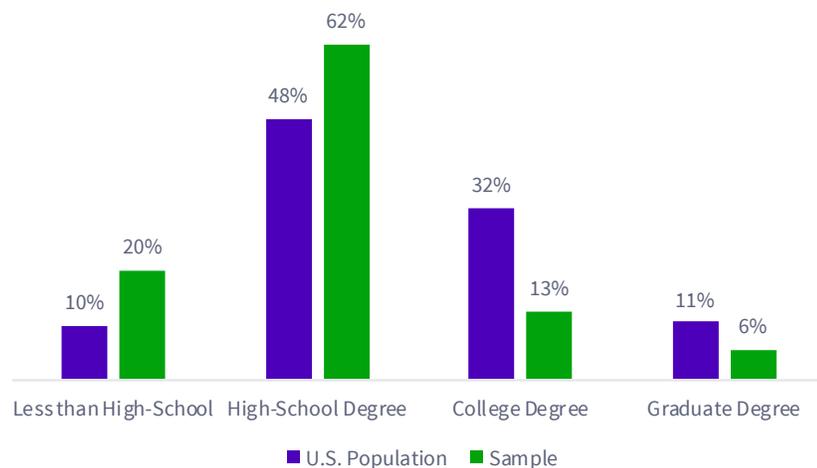
We assessed how closely the sample resembles the U.S. population in a number of different ways.¹³ First, we compared the real household financial account wealth of the survey respondent in the first year they recorded their information (when they were between 56-61 years old) to a representative sample of U.S. households that same age, which were recently sampled by the Federal Reserve in their Survey of Consumer Finances.¹⁴ We find that the distributions are nearly identical, although the sample is under-representative of extremely wealthy U.S. households. In particular, 57 percent of the sample and U.S. household population in the selected age categories have financial wealth equal to less than

FIGURE 3. Population vs. Sample Wealth Distribution



Source: Authors' Analysis of Data from Federal Reserve Board of Governors; Health and Retirement Study

FIGURE 4. Population vs. Sample Education Distribution



Source: Authors' Analysis of Data from Health and Retirement Study

\$100,000. However, where 2 percent of the population has financial assets equal to more than \$5MM, less than 1 percent of the sample holds that much wealth.¹⁵ This under-representation of highly wealthy households is a well-known challenge in conducting national surveys, and has been exacerbated in recent years by an overall decline in household survey participation.¹⁶ The result of this distributional difference is that the analysis may understate the overall lost wealth from Social Security optimization.

We next compared the education level of the heads of households in the sample to the U.S. population, finding that the sample modestly over-represents less educated households. This is a result of the pooled data design, since respondents in earlier years of the sample reflect the fact that older generations of Americans are less educated as a group compared to their younger counterparts.¹⁷ This under-weighting of highly educated adults may mean we over-estimate the share of adults that do not optimize Social Security, since there may be fewer people with the skills needed to figure out that date. But, research on whether education influences financial decision-making is mixed.¹⁸ Similarly, it's not clear that graduate degrees are sufficient in and of themselves to create the computations necessary to optimize this decision.

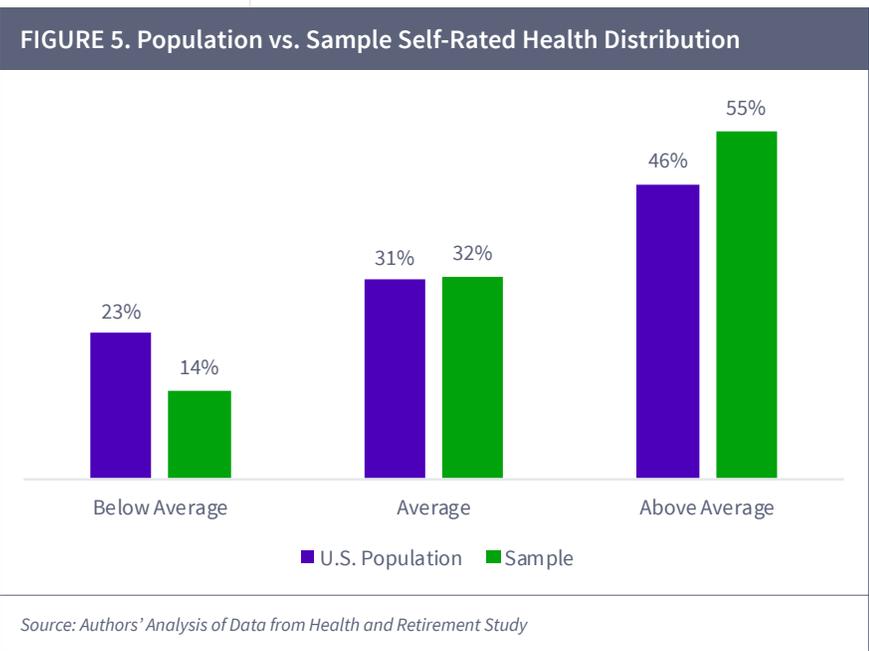
Finally, we compared two indicators related to longevity: gender and self-reported health. Since women live longer than men, on average, an

over-sample of females could negatively influence the impact of Social Security optimization on wealth accumulation and the estimated chance of having enough money in retirement. Similarly, an over-sample of self-reported healthy individuals early in retirement may also minimize the impact Social Security

optimization has on end of life wealth and the probability of success in retirement. Compared to the population, we found that the sample was nearly identical to the U.S. household distribution of women and men between 56-61 years old, suggesting that systematic differences in the longevity of men and women should be accounted for in the sample. However, the sample has a higher percentage of people that self-rate their health positively, largely because we had to remove the respondents that received Social Security disability, as addressed above. The implications for the outcomes are less clear, though, since research has found that self-rated health is not always a reliable indicator of longevity, and its efficacy varies by gender and age.¹⁹

Simulation Methodology

The analysis forecasts two sets of outcomes for each of the observed households. The first outcome set is based on the household’s actual observed decision about when to claim Social Security. In these scenarios,

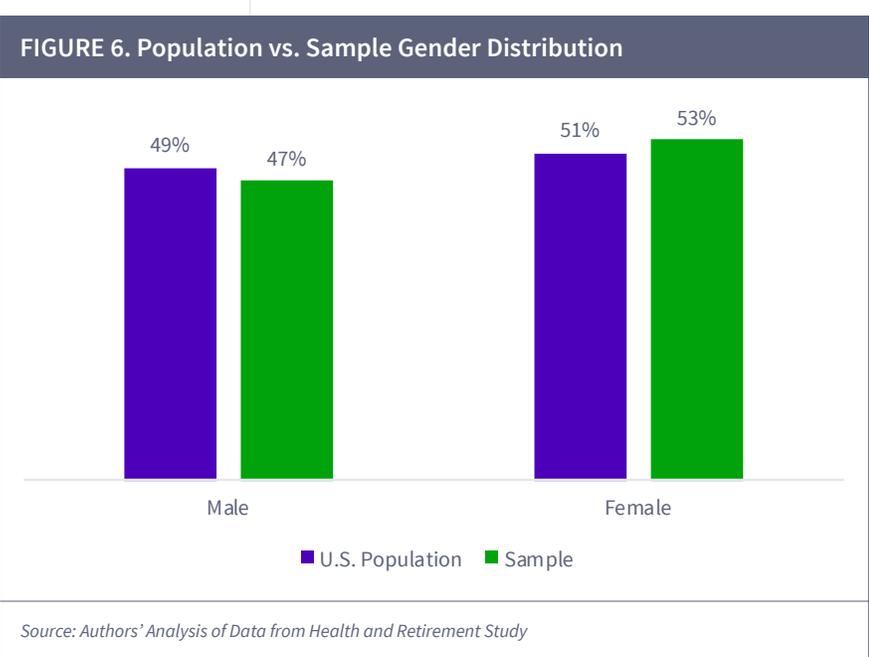


we forecast the household’s wealth, retirement income, spending, account withdrawals, capital gains and income taxes for every year in their retirement, up to the expected death of the survey respondent and their partner, if relevant. We refer to this outcome set as the “Actual Decision.”

The second outcome is based on the financially optimized decision about when the household should have actually claimed Social Security, which estimates the same information as the first option. We refer to this outcome as the “Optimal Decision.” To arrive at the optimal decision, we simulate the amount of lifetime wealth, income, and taxes associated with every combination of Social Security claiming age for a household, account sequencing strategy, and over 1,000 different possible market outcomes. In all, we simulated up to 486,000 potential future income and wealth outcomes for each participant in the sample, or about 1.1 billion different potential outcomes in total.

In particular, the following parameters were open in the simulation for this analysis²⁰:

Social Security Claim Age – Each survey respondent was assumed in unique simulations to claim Social Security in each of the years they were eligible. This allowed us to compare lifetime income, wealth, and tax outcomes for every combination of Social Security claim age. For married households, we also simulated every combination of claiming strategy.



Account Withdrawal Sequencing – Each household was assumed in unique simulations to draw-down their accounts in one of four different ways (e.g., taxable accounts first, tax deferred next). Unlike at United Income, we did not also simulate tax free accounts or go a step further to also consider the different mix of assets and investment allocations, since the survey lacked these data. The withdrawal option that was associated with maximizing lifetime wealth and income was chosen as the optimal strategy.

Market Returns – Each investment account in the household was assumed to experience one of 1,000 potential market returns, with distributions that were distinct in Years 1-10, 11-20, and beyond twenty years. The distribution of those market returns for different asset classes are proprietary data provided by Morningstar Inc.

Out of these outcomes, the model selects the Social Security claim age and account withdrawal sequence that maximizes the chance that the household will have enough money to pay for the expected discretionary and non-discretionary liabilities through the rest of their life.²¹ In the event that there are multiple plans that accomplish this objective, the model used in this analysis will then select the combination of Social Security claim age dates for the adults in the household and the account sequencing combination that maximizes lifetime income for the household in the most number of potential market futures.²² In some cases, the Optimal Decision would have been to delay claiming Social Security later than the retirees in the household actually claimed these benefits. In this scenario, the household would have a higher chance of paying for retirement and generating more wealth if they had instead lived on withdrawals from investment accounts in the beginning of their retirement. In other cases, though, the household should have sped-up one or more of the claiming dates, leaving their investment accounts less depleted.²³

The simulation also included a number of parameters that were closed, some of which are opened in the United Income technology for members. These additional parameters include:

Retirement Date – we assumed that the retirement date was fixed on the date indicated by the survey respondent, which was held constant in both the Actual and Optimized simulations. Although this could have also been optimized, the analysis was focused on finding the optimal Social Security date, and the consequences of sub-optimal claiming behavior, which would have been confounded by this additional open parameter.

Required Minimum Distributions – the required minimum distribution in each of the retirement accounts owned by the household was estimated for every year that there was an account balance in a tax deferred account and an applicable rule that affected their withdrawal requirements.

Longevity Estimates – while past research has often made up longevity estimates or used generic actuarial estimates, we use a more detailed proprietary actuarial model to create a personalized longevity estimate for each adult in a household. This method relies on a variety of questions in the HRS panel surveys about an individual's health (e.g., smoking history, exercise habits, BMI) and other predictive information about an individual's expected longevity. To avoid biasing our results towards claim delay because of systematically long lifespans, we use the median value of the personalized, expected longevity for each individual in the stochastic analysis of potential longevity outcomes. We then compared our mean longevity estimate with Social Security Administration (SSA) longevity estimates, finding that our results were nearly identical. In particular, our mean mortality age for men is 83.9 and the SSA's estimate is 84.3 years old. Similarly, our mean estimate for women is 85.8 and the SSA's estimate is 86.7 years old.

Spending Estimates – while past research has ignored spending constraints or relied on overly simple assumptions (e.g., smooth consumption), we use a proprietary spending forecast model to create a personalized spending estimate for each household. This method uses a variety of spending data from the HRS and Consumer Expenditure Survey (CEX) about an individual household's spending on different budget categories, like utilities, food, health, and discretionary items. Using these data, we build an annual estimate of how much each household will spend on discretionary, non-discretionary, and healthcare expenses through the rest of their life.

Federal and State Tax Estimates – while past research has ignored or generalized tax consequences associated with Social Security and capital gains, we estimate the expected income and capital gains tax that will need to be paid for both the Actual Decision and Optimal Decision set of outcomes for each household and every simulated future year in the analysis. These taxes are then paid for in our model through the expected income generated by the household through the rest of their life. To determine state taxes, we rely on a variable in the sample that indicates which of eleven Census regional divisions the household lives in. We then used the 2017 Current Population Survey sponsored by the Census Bureau to estimate the distribution across states of the age of households in the survey. Using that data, we then assigned randomly a state to each of the respondents in a regional division that added up to the overall distribution of people in their age group that lives in that state. This means that if 14% of households between ages 56-61 in the Pacific Northwest Census region lived in Washington, we would randomly assign that percentage of households to that division. We then used state tax rates to simulate the lifetime taxes that the individual would be expected to pay on future income.

Investment Allocations – for any investment account, we assume the average observed risk allocation of United Income's member population, which, critically, queries individuals about risk preferences related to specific future liabilities (e.g., funding food and utilities in retirement compared to lifestyle costs) and considers low-risk income like existing pensions and annuities that can offset some of those liabilities. Since this population is broad, and the results are conservative (e.g., households want to take very little risk to cover future essential expenses, but more risk with optional, lifestyle expenses), we use this allocation as a default for the population.

Household Income – every year of reported income is used in the calculation of income used in the simulation, with the exception of job and unemployment insurance income, which is assumed to stop when the respondent retires. In addition, we drop capital gains and Social Security income, since both are estimated as part of the simulations.

There are a number of additional data used from the survey for each respondent, including household information (e.g., marital status, race), health (e.g., drinking and smoking habits), census division, financial account data (e.g., account type, balance), and other socio-economic or personal information that is helpful for incorporating into United Income's proprietary algorithms.²⁴ Finally, all starting and future financial values are presented in 2018 dollars, assuming a 2.5 percent future inflation rate.

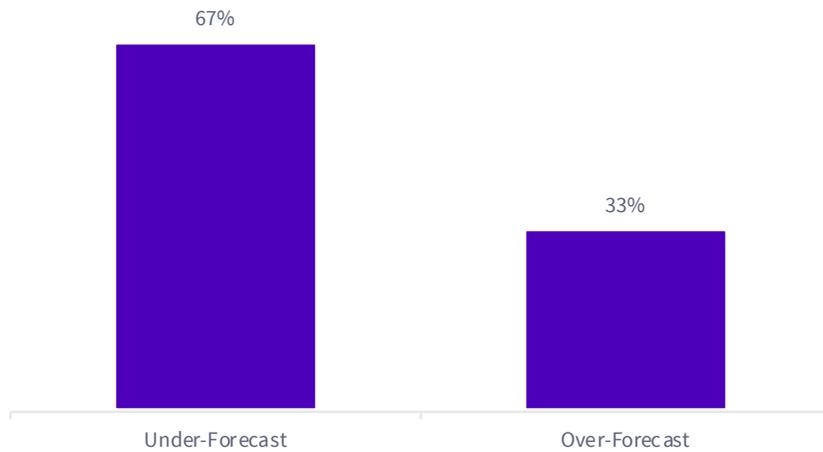
Simulation Validity

To assess the validity of United Income's wealth forecasting algorithms, we compared the estimated annual wealth of households with the actual reported wealth of households. For this simulation, we turned off the Social Security open parameter and instead used the actual observed claim date for both the respondent and their partner, if relevant. We then used the self-reported wealth through the rest of

the survey or the respondent's life, whichever ended first, and compared that to the forecasted wealth. We also considered increments of two years and up to twenty years of forecasts for an individual household.

We first looked at the ability of our forecast to predict actual observed wealth values, finding that 40 percent of the variance in observed wealth values was explained by our forecast. We then considered error type, since this has different implications for the Social Security optimization problem: over-forecasting wealth may bias the sample to delay claiming; under-forecasting may encourage early claiming.

FIGURE 7. Projected vs. Observed Household Wealth



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

In total, we found that 67 percent of the forecasted wealth values were under the actual observed value, whereas 37 percent were higher amounts. This would suggest that the forecasts may be biased to accelerate Social Security claiming (since less wealth is thought to be available for substitute income).

We next considered how error was distributed across different wealth levels. Under-forecasting for lower wealth households could artificially accelerate the need to claim Social Security, whereas it would have less of an effect on higher wealth households. We found that 78 percent of the lower wealth sample (those with less than \$100,000 in financial wealth between 56-61) were expected to have less wealth in

the future than the actual observed value, compared to just 42 percent of those with a starting wealth level greater than \$1MM. This provides further evidence that the model should expect less substitute income among those with the least, which may accelerate the optimal Social Security claim date. It also would suggest that the estimated costs of the Social Security mistake may be over-stated. However, as addressed above, the sample is under-representative of high wealth households, which moderates and may eliminate this potential outcome.

Finally, we considered the extent of the error in the forecasts, and how that varied across wealth levels. Consistent with expectations, we found that wealth forecasts improved as the starting wealth value increases. In particular, we found the median forecasted future value was within 43 percent of the observed value for those with starting wealth levels of at least \$1M. But, that median number increased to 100 percent for those with a starting financial wealth level in their late 50s/early 60s of less than \$100k. Critically, though, this percentage change estimate is highly sensitive for lower wealth households, since someone with \$2 of observed wealth could see a 100% difference if the expected value was \$1. In fact, over 57 percent of the sample had starting values less than \$100,000, so this was not an atypical scenario. In addition, as a practical matter, the median difference in wealth under \$100,000 is only 1.5 years of living expenses in retirement.

Findings

Retirees will collectively lose \$3.4 trillion in potential income that they could spend during their retirement because they claimed Social Security at a financially sub-optimal time, or an average of

\$111,000 per household. *The average Social Security recipient would receive 9 percent more income in retirement if they made the financially optimal decision about when to claim this retirement benefit.*

To assess how much income is lost by not claiming Social Security at the financially optimal time, we ran two sets of simulations. The first, called the “Actual” simulation, held the Social Security claim date constant at the claim date indicated by the survey respondents in a household. We then used the algorithm

reviewed in the Methodology section to simulate the expected income that the household would generate through the rest of their life. We next opened the simulation to estimate the “Optimal” Social Security claim date. Finally, we estimated the difference in annual and lifetime income in both the actual and optimal simulations.

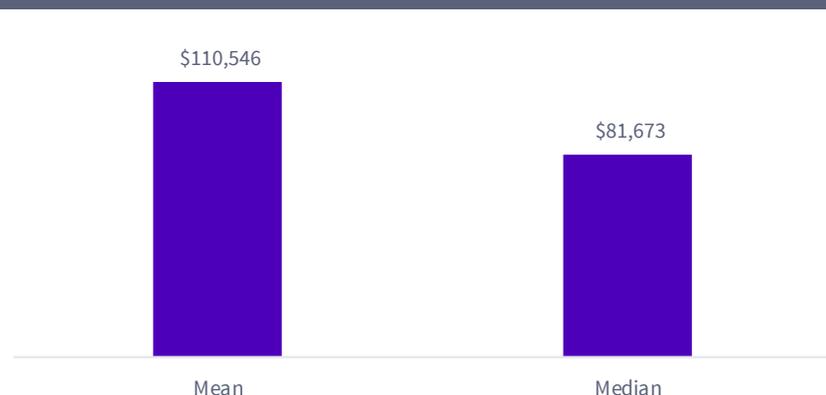
As part of the analysis, we considered the total income of the household, which included both the primary breadwinner and spouse, if relevant. In addition, the analysis considered required minimum distributions from tax preferred retirement accounts and all reported sources of income, which included, for instance, with-

drawals, rental income, and pension income. Finally, it is important to point out that we did not assume any additional job income in the “Optimal” simulation that could be created if the household might be able to earn additional income while waiting for the optimal Social Security claim date. The only open parameter in the optimization simulations was the claim date for any adult in the household.

We find that U.S. retirees would be able to generate an additional \$3.4T in income during their retirement if they optimized the decision about when to claim Social Security, or about a 9 percent increase in total expected future income among retirees that made a sub-optimal financial claiming decision. Nearly all of this income is lost because one or more retirees in a household claim Social Security too early, which means their Social Security benefit is lower than it would be if they had waited. For instance, a person that would receive a \$725 monthly benefit if they claimed Social Security at 62 would see that benefit increase to \$1,280 if they had delayed until their 70th birthday, an increase of 177 percent.²⁵ Spread out across the population of individuals that are claiming Social Security sub-optimally, those extra dollars add up to a substantial amount of money. In fact, the average household that claims sub-optimally would see their retirement income increase by \$110,546, and the median household would see their income in retirement increase by \$81,673, or an average annual increase of about \$3,400 in income.

We also were interested in the breadth and magnitude of these income gains among the population of retirees. Income gains among the wealthy, for instance, could be pulling up the average income increase for households. Similarly, the income gains could be modest relative to the other income retirees live on in retirement. For instance, nearly half of current retirees have some form of pension income, which could be quite large relative to the increase in Social Security benefits households would receive if they optimized the claiming decision. We find, however, that the income gains from improving Social Security decisions would be both broad and material relative to other income earned by retirees. In par-

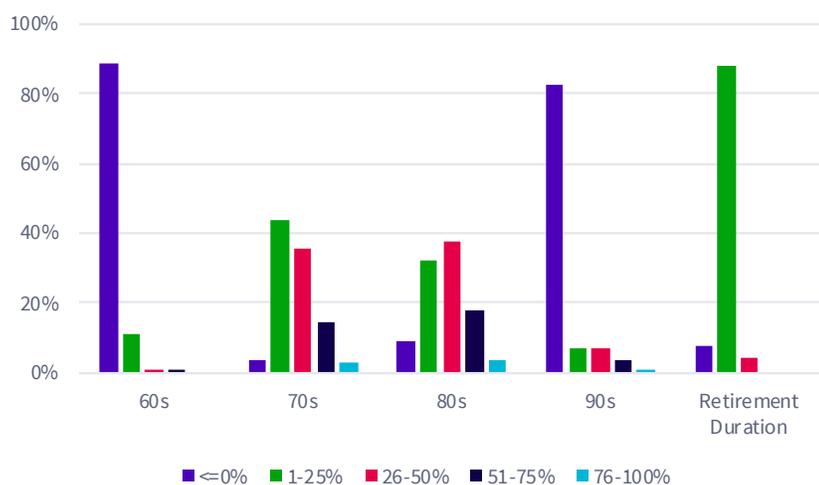
FIGURE 8. Amount of Lost Retirement Income by End of Life from Sub-Optimal Social Security Decision



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

ticular, about 92 percent of retirees that claimed Social Security sub-optimally would have seen their annual income increase if they had made the claiming decision that maximized the probability they would have enough money to afford retirement. The expected effects are also quite large. More than 50 percent of retirees that claimed sub-optimally would see their annual income in retirement increase by more than 25 percent in their 70s and 80s, and about 3 percent of those households would see their annual income increase by more than 75 percent during those years.

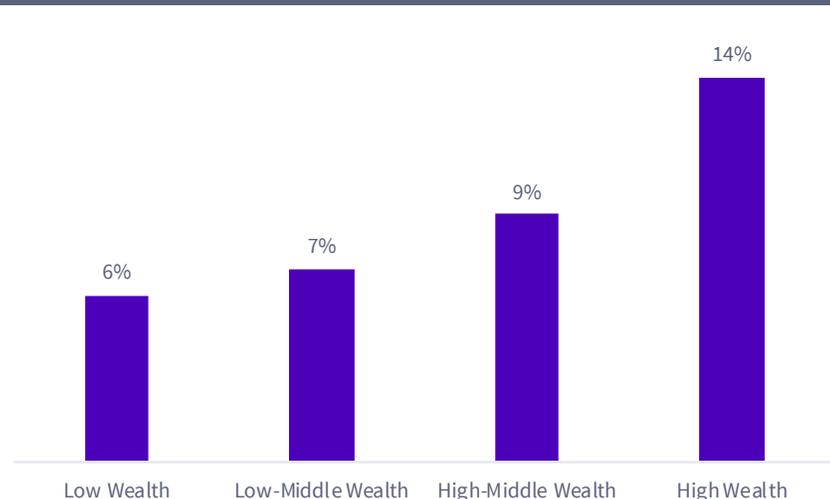
FIGURE 9. Percent Increase in Total Income from a Financially Optimal Social Security Decision



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

Those income gains are generated for retirees primarily through higher Social Security benefits they would receive if they delayed their filing decision. However, income would rise even for households that claim Social Security too late. More than 55 percent of retirees that claimed too late would see their household incomes increase in their 70s and 80s. In these cases, income gains are the result of higher investment account balances, which generate surplus income for their households, sometimes because required minimum distributions are larger than they would have been if households had instead lived off of withdrawals from these accounts earlier in retirement.

FIGURE 10. Average Lifetime Percent Increase in Income from a Financially Optimal Social Security Decision



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

We next considered how those income gains would be distributed across different wealth groups. Lower wealth households, for instance, are able to optimize Social Security primarily by delaying retirement, while wealthier households can live off of investment account balances. But, we held retirement date constant in the simulations at the age indicated by the respondent as their actual age that they stopped working, since opening this parameter would distort the Social Security optimization results.²⁶ This means that income gains may flow largely to higher wealth households. In fact, though, some households could continue to work later into their 60s, which would offset this disparity. Looking at the data, we find that higher-wealth households (those in the top quartile of starting assets) do experience the largest percent increases in income. However, they aren't the only ones to see substantial gains. Low-

wealth households (those in the bottom quartile of starting assets), still see an average gain of 6 percent, with lower-middle and higher-middle asset households seeing 7 percent and 9 percent gains, respectively.

Current retirees will collectively lose an estimated \$2.1 trillion in wealth because they made the sub-optimal decision about when to claim Social Security, or an average of \$68,000 per household. Most retirees will lose wealth in their 60s and early 70s if they choose to optimize Social Security, but will be wealthier in their late 70s through the rest of their lives.

FIGURE 11. Amount of Lost Wealth by End of Life from Sub-Optimal Social Security Decision



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

To assess the amount of lost wealth because of financially sub-optimal decisions made about when to claim Social Security, we used the algorithm reviewed in the Methodology section to compare the end-of-life wealth that resulted from the household's Actual reported Social Security claim date(s) and the expected wealth if they had instead claimed at an "Optimal" date. Since the analysis was at the household level, we looked at the end of life wealth when the last adult in the household was expected to die, rather than just the head of household. We also relied on the personalized longevity algorithms reviewed in the methodology section, which means each adult in each household was assigned a unique longevity estimate.

We found that about \$2.1 trillion will be lost by the current group of retirees in their lifetime because of financially sub-optimal decisions made about their Social Security filing age, largely because both primary breadwinners and spouses claim too early. This amounts to an average of about \$68,000 for every household that is lost from making the financially sub-optimal decision about when to claim Social Security. Since wealthy households can pull up the average amount of wealth, we also looked at the median amount of lost financial wealth, which was about \$31,000. To put those numbers in perspective, the mean household 75 years or older with financial assets in 2016 had about \$548,000 in financial wealth; the median household had \$63,000.²⁷

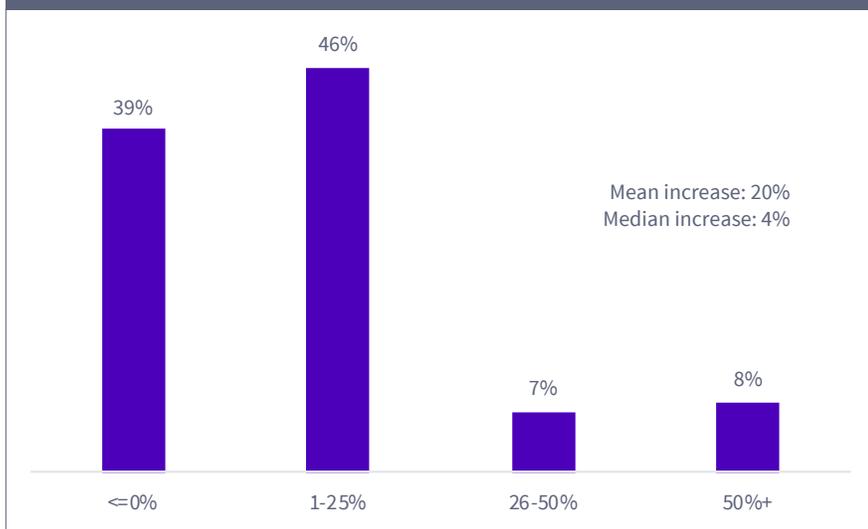
Given that finding, we wanted to know how broadly those wealth gains would be distributed among the U.S. population and the magnitude of those gains relative to their actual expected wealth. Some households, for instance, will not have wealth at the end of their lives no matter how effective they are at optimizing the Social Security decision. Other households, on the other hand, may have so much wealth that the steps needed to optimize their claiming strategy would not have a relatively large impact. In fact, we found that the majority of Social Security recipients would have seen an increase in wealth if they had made a more optimal decision about when to claim their benefits. In particular, the average Social Security recipient who claimed sub-optimally was expected to have a 20 percent increase in their end-of-life wealth, whereas the median household was predicted to have a 4 percent increase. In addition, 46 percent of these households were expected to realize a 1 to 25 percentage point increase in their end-of-life wealth if they enrolled in Social Security at the optimal time.

Importantly, though, another 39 percent of retirees were expected to have no or a negative change in their end-of-life wealth if they optimized their Social Security decision. The reason wealth decreases for some people is that the optimal decision about Social Security might lead to more income through an individual's life in more possible market and life scenarios, which gives them a higher chance of affording retirement than if they instead strived to maximize their wealth. For instance, some households can

increase their chance of having enough money in retirement by delaying Social Security and instead drawing down their investment balances. This might lead to an overall reduction in their lifetime wealth, particularly if they are expected to have a comparably shorter life, which would give them less, relative time to potentially make-up lost investment returns earlier in retirement.

This dynamic becomes clearer when we look at wealth changes at different stages of retirement among Social Security recipients. In total, 99 percent of households that choose the optimal Social Security

FIGURE 12. Share of Retirees With Wealth Changes from Social Security Optimization, by Change Magnitude



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

claim date are expected to see a reduction in their wealth in their 60s, but that number shrinks to 47 percent by the time retirees reach their 80s, since the effect of drawing down their investment accounts more in the earlier years of their retirement is out-valued by the effect of drawing down less in later years (as Social Security benefits are higher in value in most optimal scenarios). This wealth effect could be offset if older adults elected to work longer into their 60s, but, for this analysis, we held the retirement date constant at the date the survey respondent indicated that they had retired.

These expected changes in lifetime wealth speak to the psychological difficulty associated with making the financially optimal Social Security decision. More than half of Social Security

recipients who claimed sub-optimally would see an increase in their lifetime wealth via optimization, which collectively adds-up to about \$2.1T in lost wealth. But, about 39 percent would see their wealth unchanged and some would even see it modestly reduced. In addition, nearly all households would see their wealth decrease in their 60s and early 70s, even if their wealth after that point was expected to be higher. For most households wanting to make the optimal Social Security decision, they would have to get comfortable losing wealth in the near-term and also with the prospect of potentially having less wealth through the duration of their life, even while their income may be greater and/or more sustainable in more potential future markets and life outcomes. And, since there are few high-quality resources to help prospective Social Security claimants make this decision, they instead are likely choosing to protect their financial savings, even if it means they will likely have lower Social Security benefits, and a lower chance of maintaining their lifestyle in retirement.

Only 4 percent of retirees make the financially optimal decision about when to claim Social Security.

About 57 percent of retirees would build more wealth through their life if they waited to claim until they were 70 years old (when only 4 percent of retirees currently claim), while only 6.5 percent of retirees would have more wealth if they claimed prior to turning 64 (when over 70 percent of retirees currently claim benefits).

To assess the number of retirees that make the optimal decision about Social Security, we looked at the actual claim year of households in the sample and compared that to the claim year that maximizes the probability that the household will have enough money to pay for retirement.²⁸ We found that only 4 percent of Social Security claimants make the optimal decision about when to claim Social Security.

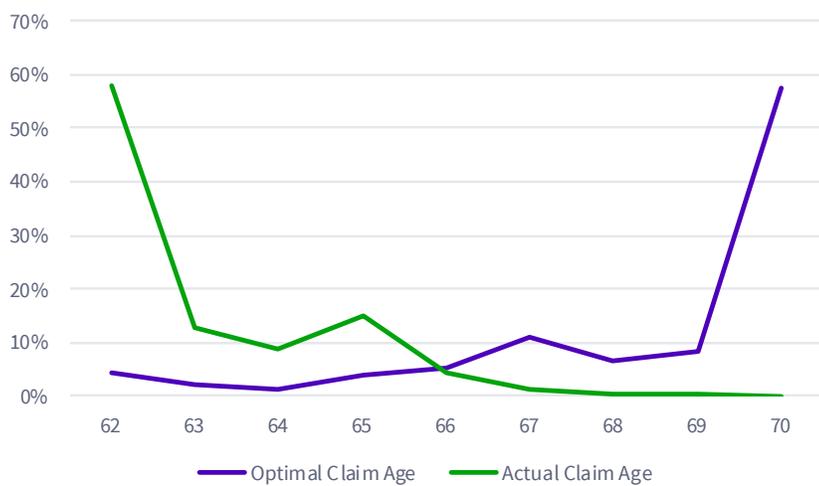
Of those that make a sub-optimal decision, nearly all of them are claiming Social Security too early, including secondary wage-earners, or spouses of the primary breadwinner in a household.

We next considered how the actual claim age compared to the optimal claim age for every year that an individual is eligible to claim Social Security. We found that a daunting task awaits individuals striving to make an optimal decision. Rather than a simple rule of thumb about when to claim Social Security, the optimal decision varies broadly both across and within households. In particular, we found that about 79 percent of eligible adults in the sample claimed Social Security between 62-64 years old, even though it is only optimal for about 8 percent of adults to claim that early in their retirement. Instead,

the most common optimal age to claim Social Security is 70 years old, when 57 percent of adults eligible for Social Security would have the best chance of affording retirement. But, the 43 percent of adults that would be better off claiming before then are spread out between 62-69 years old, highlighting the difficulty of making the optimal decision.

Further complicating this decision, we find that the optimal claiming age varies within households as well. While 71 percent of primary wage earners would have the highest chance of affording retirement if they waited until their 70th birthday, only 35 percent of secondary wage earners, or spouses of the breadwinner, would be better off waiting that late. In fact, for that

FIGURE 13. Optimal vs. Actual Social Security Claim Ages



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

population of lower wage earners in a household, about 12 percent would have a higher chance if they claim Social Security prior to their 65th birthday, consistent with the current behavior of most Social Security recipients. This is also consistent with past research, which has found that the net present value of Social Security benefits for a household is often highest when the primary wage earner claims after the secondary earner.²⁹

We next looked at how the propensity of making a sub-optimal Social Security decision varies across different household characteristics. One trait that could affect claiming behaviors is a household's wealth, for instance, since those with more financial assets may be less dependent on Social Security income and therefore comfortable with a delay. In fact, we find that the propensity to claim at a sub-optimal time modestly increases in likelihood as the wealth of a household increases, from 95 percent among the lowest wealth quartile to 99 percent among the highest quartile. That relationship is further highlighted when we consider just those households that have a chance of affording retirement. For those households, 90 percent of the bottom wealth quartile make a sub-optimal claiming decision, compared to 99 percent of the highest wealth quartile of households.

This relationship between wealth and sub-optimal Social Security decisions highlights the conflict that is created for wealth managers when they advise clients about their claiming decision. While their clients would generate more long-term wealth (and therefore more revenue for their financial advisor) if they optimized this decision, client wealth (and revenue) would likely decrease in their 60s and early

70s, since they would be living off of withdrawals instead of Social Security income. This may be one reason why we found in a recent analysis of the retirement wealth management market that few incumbents provide advice about this benefit.³⁰

Similar to the relationship between wealth and Social Security claiming optimization, we found that the propensity to make a sub-optimal Social Security decision modestly increased as the adult's educational attainment increased. One sign of that is that 94 percent of those with less than a high school degree made a Social Security claiming mistake, compared to 99 percent of those with a college or graduate degree. Similarly, 5 percent of Social Security recipients with a high school degree or less claimed Social Security too late, compared to less than 1 percent of those with more education. At the very least, these data suggest that more education does not translate into better decision-making about Social Security. More likely, education is a proxy for wealth, which may become a source of identity for some households as it grows, making it less likely they will use it as a substitute for Social Security income.³¹

Finally, we considered how an individual's lifespan affects the ability to claim Social Security at the optimal age. Those that are healthier may be more likely to delay claiming benefits as a form of longevity insurance, for instance. But, we find no relationship between longevity and claiming aptitude: those with shorter lifespans (who die before 75) claim too early at the same rate as those with longer lifespans (who die after 85).

About 21 percent of those at risk of not affording retirement would see an improvement in their chances if they claimed Social Security at the optimal time. Among those retirees at risk that start with a greater than 10 percent chance of affording retirement, 95 percent see their chances of affording retirement improve by an average of 28 percent.

While our findings indicate that retirees could greatly increase their wealth and income by improving their Social Security claim decision, we were also interested in determining whether this would affect their chances of having enough money in retirement to weather potential changes to their spending, health, and investment returns. After all, more wealth and income do not necessarily amount to a sufficient amount of either. For this analysis, we considered whether each household was expected to have enough money in up to 486,000 potential futures that we simulated for each household. In each of these scenarios, we then examine whether the odds of them having enough money in retirement improve if we change their Social Security claim date from their actual age to the optimal age.

We find that, overall, about 12 percent of retirees can improve their odds of having enough money in retirement by optimizing their Social Security decision, and that the average improvement is 22 percentage points. That means, for instance, that someone with a 20 percent chance of being able to afford retirement could increase their odds to 42 percent by making the optimal decision about Social Security instead of the age they actually selected.

But, this average impact is weighed down by the fact that 58 percent of retirees have nearly a guaranteed chance of being able to afford retirement, since they have more than enough money to cover their costs in nearly every potential future scenario. If we remove those households from the sample, we find that 21 percent of retirees at risk of not affording retirement would see an improvement in their chances if they claimed Social Security at the optimal time. Similarly, if we remove those households that have nearly no chance of being able to afford retirement, we see that 95 percent of households would see their chances of having enough money improve by an average of 28 percent.

FIGURE 14a. Share of Retirees That Would See a Change in the Chance They Have Enough Money in Retirement, by Mistake Type

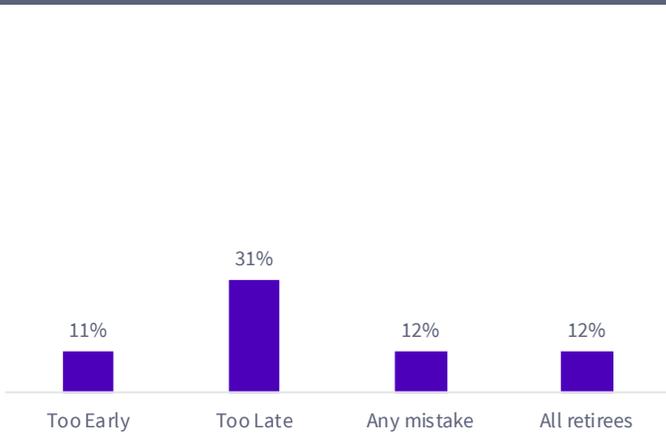


FIGURE 14b. Average % Increase in Chance of Success, by Mistake Type

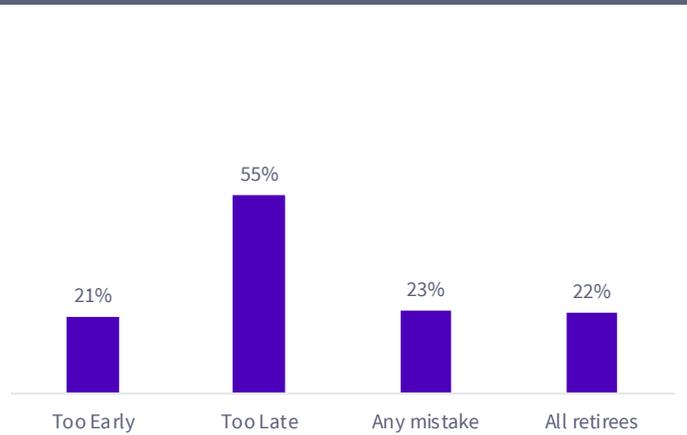


FIGURE 15a. Share of Retirees That Would See a Change in the Chance They Have Enough Money in Retirement, by Mistake Type - 10-90% Starting Chance of Success

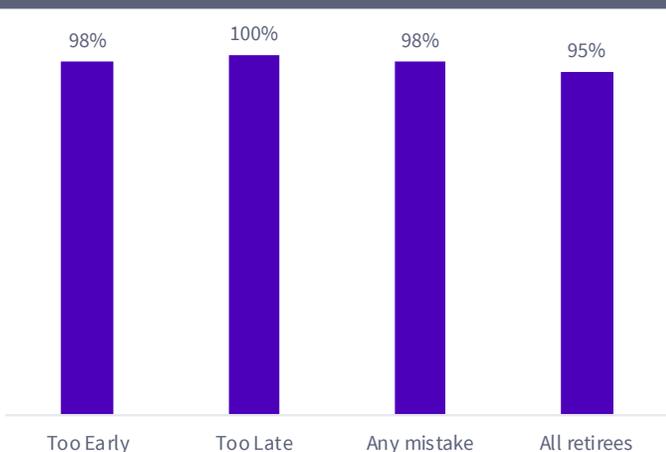
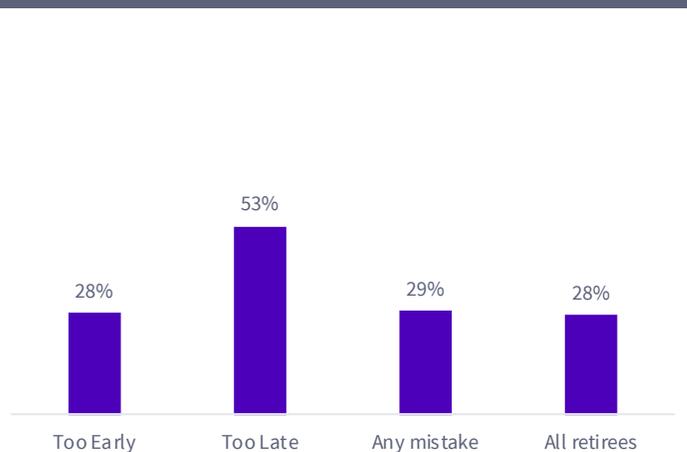


FIGURE 15b. Average % Increase in Chance of Success, by Mistake Type - 10-90% Starting Chance of Success



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

These data indicate that Social Security optimization is most impactful on the probability of having enough money in retirement for those that are on the edge between being able to afford or not afford retirement. This is further illustrated when we consider the relationship between wealth and the impact of Social Security optimization on the probability of having enough money for retirement. Among those at risk of not affording retirement prior to making the optimal decision that have wealth at the beginning of retirement that is less than 75 percent of other retirees, only 6 percent would improve their chance of success in retirement. But, more than 50 percent of middle and higher wealth households would improve their odds – including 65 percent of high-wealth households, or those households in the top quartile of wealth. In addition, the impact magnitude is largest among households in the second wealth quartile (or low-middle wealth), who see a 40 percentage point average improvement in the chances they will afford retirement.

Finally, we consider how the expected lifespan of an individual is related to the impact Social Security optimization has on expected financial success in retirement. For instance, retirees that are expected

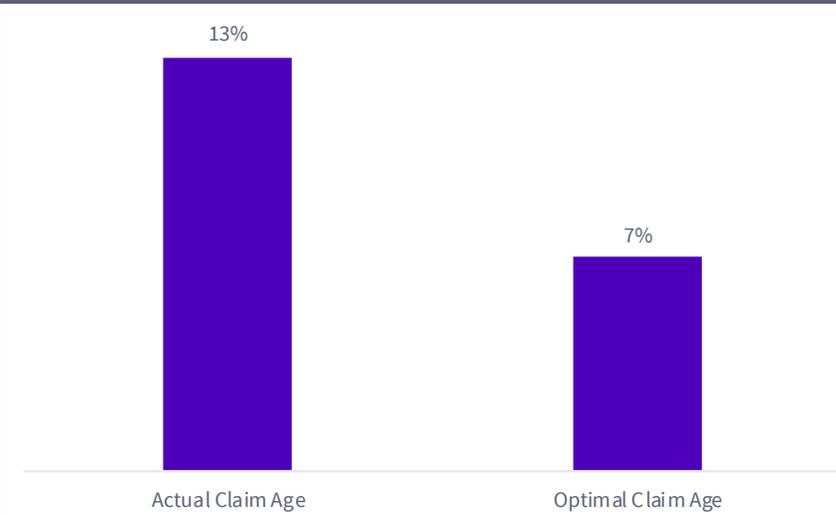
to die in their 60s or 70s may not face as much of an obstacle paying for retirement compared to those that are expected to live into their 90s or beyond. In fact, this is exactly what we find, although there is still an impact on retirees with shorter lifespans. In particular, 13 percent of those who are expected to die before 75 and are at risk of not being able to afford retirement can improve their chances if they optimize their Social Security decision. But, among those with longer expected lifespans, or those that

will live past 85, 36 percent of those households would be more likely to afford retirement if they made better Social Security decisions. The magnitude of the expected impact is about the same across all of these different groups – about a 28 percent improvement, on average.

Elderly poverty could be cut by nearly 50 percent if all retirees claimed Social Security at the financially optimal time. *In particular, about 13 percent of people over the age of 70 are expected to live in poverty at some point, which is estimated to fall to 7 percent if retirees had claimed Social Security at the optimal time – a rate that could potentially fall even further if they earned additional income while they waited to claim Social Security.*

Since claiming Social Security at the optimal time created broad increases in both wealth and income for older Americans, we were also interested in what impact it would have on the elderly poverty rate. Importantly, we did not want to assume that lower income households could continue to work while they waited to claim Social Security at a later time in life, since jobs might not be available or there could be physical limitations to continuing to work. We also wanted to isolate the impact of Social Security on financial security from any additional benefit that could be created from working later. For these reasons, we held the actual retirement date constant for these households and only varied when the household claimed Social Security. This likely understates how much elderly poverty would be reduced if more people claimed at an optimal age.

FIGURE 16. Percent of Population that Ever Experiences Poverty After Age 70



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

FIGURE 17. Observed vs. Ideal Claim Ages, Among Those Who Escape Post-70 Poverty via Social Security Optimization



Source: Authors' Analysis of Data from Health and Retirement Study, United Income

We find that about 13 percent of households in our sample experience poverty after age 70 for one or more years. However, that rate would fall to 7 percent if all of those households had instead claimed Social Security at the financially optimal time. In fact, we suspect that rate would be even lower if we factored in likely earnings that would accumulate while these households waited to claim Social Security.

In almost all cases, lower income households are claiming too early and would be better off financially if they waited to claim at a later age. In fact, like their wealthier peers, the claiming trends among lower income households are close to exactly the opposite of what is financially optimal. For example, the percent of people who claim at the earliest possible age, 65 percent, is nearly the same as the percent who should claim at the latest possible age, 62 percent.

We also find that the cost of nearly halving the elderly poverty rate through optimal Social Security claiming is about an extra \$40,000 in lifetime income, on average. Importantly, though, this estimate does not include the FICA tax gains that would be generated if these households waited to claim Social Security until later life, suggesting the actual cost is likely lower than this estimate. We recognize that not all people have the ability to continue working until their optimized Social Security claim age. However, it is clear that some older Americans needlessly experience poverty due to sub-optimal Social Security claiming.

Conclusion

Research consistently finds that the financial impact of Social Security on retirees could be even greater if more of them waited to claim benefits. But, it does not address how much is annually lost from households making the wrong decision about when to claim Social Security, how many are making financially sub-optimal claiming decisions, or who is making those decisions. It also does not provide much guidance about why people are making the financially wrong decision about when to claim Social Security benefits. This paper begins to provide answers.

We find that nearly all U.S. households do not claim Social Security at the age that will maximize their chance of having enough money in retirement or, if that is not an issue, maximize their income and minimize their taxes. In total, those financially sub-optimal decisions add up to an estimated \$2.1 trillion in wealth that will be lost among the current retirees and \$3.4 trillion in lost income. Even more impactful, about 21 percent of those at risk of not affording retirement would see an improvement in their chances if they claimed Social Security at the optimal time – and 95 percent of households that have a non-zero chance of affording retirement would see this chance improve by an average of 28 percent. While not a complete solution for insufficient retirement savings, optimizing Social Security would improve the lives of millions of retirees, including many that are currently living with low odds of having enough money to afford the expenses they will likely encounter in retirement.

Critically, though, that extra wealth, income, and likelihood of affording retirement comes with a substantial perceived cost for individual retirees, since nearly all households that choose this financially optimal and safer path will have to give up wealth in their 60s. That happens because many households that push off claiming Social Security must instead live off of investment account withdrawals instead of Social Security income. This wealth effect could be staved off by working longer, but that has so far not proved to be a popular option for retirees.

For policymakers, these data indicate that nearly no retirees are financially better off being able to claim at the earliest years that households are currently able to. More troublingly, retirees face a strong near-term disincentive to make the financially optimal decision, since their wealth will fall before it gains in value. This is exactly the type of market failure that public policy can effectively address. Given that evidence, we believe early claiming should be made an exception, and reserved for those who

have a demonstrable need to claim benefits before the full retirement age.³² Though this could be done through means-testing rules, another option would be to simply change how the Social Security Administration describes claiming ages to the public. Instead of portraying age 62 as the “early eligibility age,” age 62 could simply be labeled the “minimum benefit age” while age 70 could be labeled the “maximum benefit age.” Regardless of the vehicle, policymakers need to address the fact that aging Social Security rules have become an obstacle to the financial success of retirees, even while it serves as a fundamental source of retirement income for large shares of retirees.

Policymakers may also want to consider the clear disincentive that wealth management firms, which manage over \$20 trillion in retail assets, have to help clients make optimal Social Security claiming decisions, since it is likely investment account balances (the source of their revenue) will fall. Although this decision will create much wealthier customers over the long-term, it can depress short-term revenue, which incumbent firms may not be comfortable with or feel like they are able to address. Providing cover for executives at these firms to make the right financial decision for their clients, and the right long-term decision for their shareholders, may be helpful at accelerating the adoption of highly efficacious Social Security advice.

Finally, policymakers may want to consider providing the Social Security Administration the resources to do more, perhaps in partnership with third-party fiduciaries, to help eligible households determine their optimal claim age. That limited investment could help recapture some of the \$5.5T lost in wealth and income to retirees and the U.S. economy because of the struggles retirees currently face making the right decision.

About the Authors

Matt Fellowes is the founder and CEO of United Income. Prior to founding United Income, Matt was the Chief Innovation Officer at Morningstar and the founder and CEO of HelloWallet, an award-winning financial guidance software company acquired by Morningstar Inc. in 2014, and a Fellow at the Brookings Institution. He currently sits on the Advisory Board of the Stanford Center on Longevity. A native of Chicago, he holds a Ph.D. from the University of North Carolina Chapel Hill, an MPP from Georgetown University, and a B.A. from St. Lawrence University.

Jason J. Fichtner is a Senior Lecturer of International Economics and an Associate Director of the International Economics and Finance (MIEF) program at Johns Hopkins University School of Advanced International Studies (SAIS). He teaches courses in public finance, behavioral economics and cost-benefit analysis. He is also a Fellow with the Bipartisan Policy Center and a Research Fellow with the Alliance for Lifetime Income and a Research Fellow with the Center for Financial Security at the University of Wisconsin. His research focuses on Social Security, federal tax policy, federal budget policy, retirement security, and policy proposals to increase saving and investment. Previously, he was a Senior Research Fellow with the Mercatus Center at George Mason University. Fichtner also served in several positions at the Social Security Administration, including as Deputy Commissioner of Social Security (acting), Chief Economist, and Associate Commissioner for Retirement Policy. He also served as a Senior Economist with the Joint Economic Committee of the US Congress, as an Economist with the Internal Revenue Service, and as a Senior Consultant with the Office of Federal Tax Services at Arthur Andersen, LLP. Fichtner earned his BA from the University of Michigan, Ann Arbor; his MPP from Georgetown University; and his PhD in public administration and policy from Virginia Tech.

Lincoln Plews is a Research Analyst at United Income. Previously, Lincoln served as a fellow with Princeton in Asia in Shanghai, China. He holds a B.A. from The College of Wooster.

Kevin Whitman worked for ten years at the Social Security Administration where he served in various positions, including as the Director of the Office of Policy Research. He holds a B.A. from the University of Virginia and an M.P.P. from George Mason University.

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About United Income

United Income is a money management solution that extends the life and potential of money to compliment the innovations that have extended human life. Our unified system of money management reflects a deeply held belief that financial decisions are interconnected. New data and technology allow us to observe and understand these relationships in new ways. We translate that unique understanding into powerful and personalized money management for our members that brings their retirement dreams to life.

Our team brings decades of experience leading the finance and technology markets. We have written or overseen the laws governing the retirement and financial markets in places like the White House and Department of Treasury, helped to invent technologies that have changed the world at places like Amazon and Tesla, and won awards like the Webby for the best financial software website in the world. We are all at United Income to pursue the ambitious goal of understanding how the consumer finance world works as a unified system. This unique understanding of how the world works allows us to bring hope, meaning, simplicity, and empowerment to our members.

Notes

- 1 Social Security Administration. “Fiscal Year 2019 Budget Overview.” The Justification of Estimates for Appropriations Committees informs members of Congress. Note that the Old-Age and Survivors Insurance Program is estimated to pay out \$892B in FY2019 benefits; \$149B in Disability Insurance benefits; and about \$59B is expected to be paid out in Supplemental Security Income. Of the beneficiaries, approximately 68 percent are expected to be retired. The remaining share of beneficiaries were either dependents or otherwise eligible.
- 2 Social Security Administration. 2018. Social Security Fact Sheet. Note that the Federal Reserve Board of Governor’s Survey of Consumer Finance provides a similar conclusion. See, for instance, Matt Fellowes and Lincoln Plews. 2018. “How Longer Lives Have Changed Retirement.” Washington, DC: United Income.
- 3 Fellowes and Plews (2018).
- 4 See, for instance, John B. Shoven and Sita Nataraj Slavov. 2014. “Does it Pay to Delay Social Security?” *Journal of Pension Economics and Finance*. Volume 13, Issue 2, pp 121-44.
- 5 For historical data on claiming trends related to age and gender, see, for instance, Alicia H. Munnell and Anqi Chen. 2015. “Trends in Social Security Claiming.” Center for Retirement Research at Boston College, IB Number 15-8. According to these data, less than 10 percent of beneficiaries claimed after they turned 67. Note that Social Security benefits are actuarially increased every year between 62 and 70 to reflect an expected shorter duration of benefits.
- 6 See Shoven and Slavov (2014), for instance. For an excellent review of the academic literature, see Gila Bronshtein, Jason Scott, John B. Shoven, Sita N. Slavov. 2016. “Leaving Big Money on the Table: Arbitrage Opportunities in Delaying Social Security.” National Bureau of Economic Research, Working Paper 22853.
- 7 There are many examples of this in the literature reviewed by Bronshtein, Scott, Shoven, Slavov (2016). For instance, scholars will simulate the effects of different interest rates and longevity estimates; or use longevity estimate variation as a proxy for gender or education differences.
- 8 See, for instance, William Meyer and William Reichenstein. 2010. “Social Security: When to Start Benefits and How to Minimize Longevity Risk.” *Journal of Financial Planning*. March 2010, Vol. 23 Issue 3, p49-59.
- 9 There are many examples of this in the literature reviewed by Bronshtein, Scott, Shoven, Slavov (2016).
- 10 University of Michigan Health and Retirement Study (HRS), which is a biannual panel survey made-up of approximately 20,000 people in America. The survey is funded by the National Institute on Aging and the Social Security Administration.
- 11 Note that spouses of primary respondents can be younger than 50 years old.
- 12 This included both the primary survey respondent and their spouse, if relevant.

- 13 Each panel is selected to be representative of the U.S. household population. However, since we needed to (a) analyze households prior to the first year they were eligible for Social Security, we only worked with a portion of the panel in any given year. In addition, we (b) pooled the panels together to include all households that met this and the other criteria reviewed in the Methodology section. This means that the resulting sample was a combination of panels, or a pooled, cross-sectional panel data design. For a good summary of the unique statistical properties of these datasets, as well as analyses relevant to it, please see Terry Dielman. 1988. Pooled Cross-Sectional and Time Series Data Analysis. New York: CRC Press.
- 14 For a similar approach to establishing survey validity, see Jesse Bricker, Alice Henriques, and Kevin Moore. 2017. “Updates to the Sampling of Wealthy Families in the Survey of Consumer Finances,” Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board. We rely on the 2016 Federal Reserve Board’s Survey of Consumer Finances for the representative sample. About 5 percent of the sample was younger than 56, but retired.
- 15 The same conclusion is reached if you look at the two sets of quartiles. The U.S. household population with a head of household aged between 57-61 has the following financial account quartiles (\$3k, \$59k, \$346k, \$8.3MM), compared to the sample quartiles (\$8k, \$65k, \$257k, \$2.6MM).
- 16 See Jesse Bricker, Alice Henriques, and Kevin Moore (2017).
- 17 U.S. Census Bureau (e.g., less than 5 percent of U.S. adults had a college degree in 1940, today that number is over 30 percent). But, see James J. Heckman and Paul A. LaFontaine. 2010. “The American High School Graduation Rate: Trends and Levels.” Review of Economics and Statistics, 92: 2, 244-262.
- 18 See, for instance, Shawn Cole, Anna Paulson, and Gauri Katrini Shastey. 2008. “Smart Money: The Effect of Education on Financial Behavior.” Harvard Business School Finance Working Paper No. 09-071; Justine S. Hastings, Brigitte C. Madrian, and William L. Skimmyhorn. 2013. “Financial Literacy, Financial Education, and Economic Outcomes.” Annual Review of Economics. 5:1, 347-373.
- 19 Yael Benyamini, Tzvia Blumstein, Ayala Lusky, Baruch Modan. 2003. “Gender Differences in the Self-Rated Health–Mortality Association: Is It Poor Self-Rated Health That Predicts Mortality or Excellent Self-Rated Health That Predicts Survival?” The Gerontologist, Volume 43, Issue 3, pp 396–405.
- 20 Note that the United Income software opens other parameters to optimize the path to maximizing wealth at the lowest possible risk for its members. These additional proprietary algorithm steps are not replicated in this analysis.
- 21 In some cases, there are low to no market scenarios where households would not be able to afford retirement. In these cases, the model then follows a stepwise optimization sequence that seeks to minimize lifetime taxes and maximize Social Security income. United Income members are eligible for further optimization considerations, which were closed for the purpose of this analysis.
- 22 Note that the United Income software takes additional steps to identify the decisions needed to maximize wealth at the lowest possible risk for its members. These additional proprietary algorithm steps are not replicated in this analysis.

- 23 This paper is focused on specific, observed phenomena, like income and wealth, rather than a theoretical concept like utility, which has been a focus of other papers. This means we do not comment on other considerations related to optimization, such as a penalty that uncertain longevity imposes on welfare which may drive households to prefer higher consumption today rather than in the future.
- 24 There are a number of additional variables that the United Income software takes into account in its optimizations. These variables were not available from the HRS survey and were therefore omitted from this analysis.
- 25 This assumes a benefit of \$1,000 at a full retirement age of 66 and 6 months, and is current as of 2019.
- 26 This would happen because there is a large number of people that should delay retirement to increase the probability that they will be able to afford retirement. Doing so, however, would also delay the Social Security claiming decision, which is why we held this critical decision made by retirees constant.
- 27 Note that for all households in this group, and not just those with financial assets, the mean is about \$543,000, and the median is about \$62,000, according to the Federal Reserve data.
- 28 In some cases, there is no difference in the probability that a household would be able to afford retirement if they optimized Social Security. In these cases, the model then follows a stepwise optimization sequence that seeks to minimize lifetime taxes and maximize Social Security income as a proxy for maximizing wealth (since retirement age and investment allocations are fixed in this analysis). United Income members are eligible for further optimization considerations, which were closed for the purpose of this analysis.
- 29 John B. Shoven and Sita Nataraj Slavov, 2012. "The Decision to Delay Social Security Benefits: Theory and Evidence." National Bureau of Economic Research, Working Paper 22853.
- 30 Matt Fellowes, Lara Langdon, Lincoln Plews, and Davey Quinn. 2017. "The Efficient Investor: A New, Low-Cost Approach to Investing and Managing Wealth." Washington, DC: United Income.
- 31 This unwillingness to spend down assets may also be related to a few well-known psychological biases – the endowment effect, loss aversion, and status quo bias, all of which suggest that a person is highly biased against parting with something once they've acquired it. For a full discussion of these biases, see Daniel Kahneman, Jack L. Knetsch, and Richard H. Thaler. 1991. "Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias." *Journal of Economic Perspectives*. 5:1, 193-206.
- 32 For a detailed proposal, please see: Gary Koenig, Jason J. Fichtner, and William G. Gale. 2018. "Supplemental Transition Accounts for Retirement: A Proposal to Increase Retirement Income Security and Reform Social Security." *Public Policy & Aging Report*. Volume 28: Issue 1, pp 522-24.