

# How to "Pensionize" Any IRA or 401(k) Plan

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**H**ow will ordinary workers retire in a defined contribution (DC) world? How do they decide if they have enough savings to afford retirement? How can they generate reliable retirement income?

These questions began to nag at me when I started replacing employers' defined benefit (DB) plans with DC plans in the late 1980s in my role as a consulting actuary working in the private sector. Over the next two decades, I transitioned more than 20 DB plans. All that time, the above questions continued to haunt me.

When replacing defined benefit plans with defined contribution plans, it may not have been a good idea to ask ordinary workers to be their own investment manager and actuary.

I didn't think it was a good idea to ask American workers to be their own investment managers and actuaries. This thought led me on a 30-year quest to help older workers and retirees find viable retirement income solutions – that's been a primary focus of my current encore career as a retirement researcher and educator.

## DC world challenges

American workers face three challenges in a DC world:

1. *Inadequate savings.* Various studies show that roughly half of all older American workers (age 55+) have less than \$100,000 in retirement savings, not close to adequate for a traditional retirement of “not working.”<sup>1,2</sup> Roughly one-fourth have between \$100,000 and \$500,000, and another one-fourth have more than \$500,000.
2. *Leakage.* According to one study, an estimated one-fourth of DC accounts experience an outstanding loan, hardship withdrawal, or early withdrawal upon job separation.<sup>3</sup>
3. *Generating retirement income.* Only half of all DC plans offer any options for converting balances into periodic retirement income, and typically fewer than one in five plans offer guaranteed lifetime payouts.<sup>4,5</sup>

This paper focuses on solutions to the third challenge – generating retirement income – while acknowledging the importance of the first two challenges.<sup>6,7</sup>

## Most workers don't plan like actuaries and investment managers

To address the above challenges, employers often suggest that workers consult a financial planner. But finding an adviser who is both skilled with retirement income planning and isn't conflicted by how they're paid can be a roadblock for workers. As a result, only about one-third of workers contact advisers for any purpose.<sup>3</sup>

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Without anyone to consult, only about half of older workers attempt to calculate how much money they need to retire.<sup>1</sup> In fact, the “planning” that most older workers do is to estimate their monthly retirement income and then reduce their living expenses to that level.<sup>8</sup> Unfortunately, most workers don’t have the skills to convert their savings into retirement income. In addition, most retirees have very short planning horizons – just a few years – which is far shorter than their remaining life expectancies.<sup>8</sup>

Retirees tend to exhibit two distinct strategies for deploying their retirement savings:

1. Conserving savings for a rainy day, minimizing their withdrawals and treating savings as an emergency fund,<sup>9</sup> or
2. “Winging it” by treating their savings like a checking account to pay for current living expenses, often withdrawing too rapidly at an unsustainable rate.<sup>10</sup>

Neither strategy seems optimal in a DC world.

## We need straightforward retirement income solutions

There’s a clear need for DC plan sponsors and financial institutions to help their older workers and customers generate reliable, lifetime retirement income – to “pensionize” their IRAs and DC accounts. This would enable middle-income workers to complete the rudimentary retirement planning described previously.

Annuities are one viable method to deliver guaranteed lifetime income to retirees, but not many older workers buy annuities on their own. And many employers are reluctant to offer annuities in their DC plans. Furthermore, many employers worry about accepting fiduciary liability when designing and implementing any retirement income solution.

The good news? Recent research by the Stanford Center on Longevity (SCL), collaborating with the Society of Actuaries (SOA), identifies a straightforward retirement strategy that can work for most middle-income retirees and be implemented in virtually any traditional IRA or 401(k) plan.<sup>11</sup> This research provides a framework for assessing different retirement income generators (RIGs) and navigating the many tradeoffs that older workers face when making retirement income decisions.



## Retirement planning involves tradeoffs

Choosing a specific solution that will help workers generate retirement income requires them to make informed tradeoffs between potentially competing goals:

- Maximizing lifetime income
- Providing access to savings (liquidity)
- Planning for bequests
- Minimizing implementation complexity and costs
- Minimizing income taxes
- Protecting against common risks:
  - Longevity
  - Inflation
  - Investment
  - Death of their spouse
  - Cognitive decline and mistakes
  - Fraud
  - Political/regulatory issues (changes in laws or regulations on retirement plans or Social Security, or the taxation of these benefits)

Unfortunately, there's no perfect RIG that meets all these goals, although one comes close, as we'll see below. It should surprise no one that the average American worker isn't adequately trained to make informed decisions regarding retirement income strategies that effectively balance all the above goals.

## There are many viable retirement income generators

Here are common RIGs that each have their own advantages and disadvantages:

- Social Security
- Pensions
- Investing savings and using a systematic withdrawal plan (SWP) to generate a retirement paycheck
- Buying a guaranteed lifetime annuity from an insurance company (think of this as akin to a personal pension)
- Working
- Real estate rental income or income from other businesses
- Reverse mortgage

The average American worker isn't adequately trained to make informed decisions about retirement income strategies.

It's important to realize that each of these RIGs produces a different amount of retirement income. In addition, the advantages and disadvantages of some RIGs tend to complement others, which is one reason retirees should diversify their sources of retirement income to satisfy their unique goals and circumstances.

## A systematic comparison of retirement income strategies

Many analyses of retirement strategies contain significant limitations. For example, they might:

- Analyze only a few different retirement income strategies, perhaps limiting the analysis to solutions that their financial institution offers.
- Analyze solutions to deploy retirement savings in isolation, without considering how the solution interacts with valuable Social Security benefits.
- Not address the various goals that might be important to older workers and the tradeoffs these workers face.

The SCL/SOA project analyzed and compared 292 different retirement income strategies, using analytical techniques that many large pension plans use to devise funding and investment strategies.

To address these limitations, the SCL/SOA project<sup>11</sup> examined 292 different retirement income strategies, including various combinations of:

- Starting Social Security at age 65
- Starting Social Security at age 70
- Single premium immediate annuities (SPIA)
- Systematic withdrawal plans (SWPs), including the IRS required minimum distribution (RMD)
- Guaranteed lifetime withdrawal benefits (GLWB)
- Fixed index annuities (FIA)
- SPIA/SWP combinations
- FIA/SWP combinations
- Tenure payment from a reverse mortgage

For three hypothetical retirees, we prepared the following analyses:

- Stochastic forecasts of income and accessible wealth (liquidity) throughout retirement for each retirement solution
- An efficient frontier that compares the tradeoff between expected amount of income vs. liquidity for the solutions we analyzed
- Patterns of retirement income over the retirement period to determine if income is expected to keep up with inflation and estimate the potential volatility

Stochastic forecasts and efficient frontiers are analytical techniques that many large pension plans use to devise funding and investment strategies.

Our economic assumptions reflect the low-interest environment prevalent in 2017. We compared high-performing and low-performing solutions to illustrate the impact of net investment performance and institutional vs. retail pricing on retirement outcomes. For the cost of annuities, we used actual annuity purchase rates that were prevalent at the beginning of 2017.

Figure 1 shows one example from our efficient frontier analyses for a hypothetical 65-year-old single female with \$250,000 in retirement savings.

We used these efficient frontier analyses to narrow the number of solutions – from 292 to 21 – that we examined in more detail, as discussed next.

## The retirement income dashboard

To help retirees and their advisers make informed tradeoffs regarding the potentially competing goals described previously, we developed eight metrics to help retirees and planners compare different retirement income solutions:

1. Average annual real retirement income expected during retirement
2. Increase or decrease in real income expected during retirement (inflation protection)
3. Average accessible wealth expected throughout retirement (liquidity)
4. Rate that wealth is spent down
5. Average bequest expected upon death
6. Downside volatility (the estimated magnitude of potential future reductions in income)
7. Probability of shortfall relative to a specified minimum threshold of income
8. Magnitude of shortfall

We used these eight metrics to prepare detailed comparisons of 21 retirement income solutions. For these solutions, we prepared a dashboard to compare the results of our analyses. Figure 2 shows one dashboard example from our report for a married couple age 65, with \$400,000 in retirement savings.

## Social Security is close to the perfect retirement income generator

Our analyses demonstrate that Social Security meets more retirement planning goals than any other RIG, as follows:

- It helps maximize amount of expected retirement income through a thoughtful optimization strategy.
- It helps minimize taxes by excluding part or all of income from taxation.
- It protects against most common risks:
  - Longevity
  - Inflation
  - Investment
  - Death of a spouse through the survivor's benefit
  - Cognitive decline and mistakes
  - Fraud

Our analyses demonstrate that Social Security income meets more retirement planning goals than any other retirement income generator.

As such, it makes sense for workers to maximize the value of this important benefit, usually by delaying the start of benefits for the primary wage-earner. The optimal strategy for a married couple often depends on their specific circumstances, and it may be desirable to use commonly available software or consult a financial adviser who specializes in Social Security optimization.

Many reputable researchers have confirmed the general advantages of a Social Security delay strategy.<sup>12,13,14,15,16</sup> These studies typically study Social Security benefits in isolation without considering income from other sources. By using a total retirement portfolio approach, including income generated by savings, our analyses amplify the importance of the analyses prepared by these researchers.

Our analyses show that for many middle-income retirees, Social Security benefits will represent one-half to two-thirds of total retirement income if workers start Social Security at age 65, and from three-fourths to more than 85% of total retirement income if they optimize Social Security by delaying until age 70.

As a result, for many middle-income retirees, the total retirement income portfolio reflects the desirable features of Social Security described above. In other words, if Social Security benefits represent 80% of the total retirement income portfolio, then at least 80% of the total portfolio will enjoy Social Security's advantages listed above. *In this case, Social Security may be the only annuity income that many middle-income retirees will need*, given Social Security's dominance of their total retirement income portfolio.

Figure 3 provides an example of our analyses showing the portion of total retirement income that's represented by Social Security for the 65-year-old married couple with \$400,000 in savings for various retirement income solutions.

Pessimists might point out that Social Security is subject to political risk; our leaders can change the amount of benefits paid to current retirees or older workers. When deciding on a Social Security claiming strategy, older workers must weigh this risk against Social Security's other desirable features. They might also want to consider the likelihood that politicians will make significant benefit reductions for existing retirees and current workers who are close to retirement.

## Introducing the *SS/RMD Spend Safely in Retirement Strategy*

Our analyses identified a straightforward strategy that produces a reasonable tradeoff among various goals for middle-income retirees. This strategy delays Social Security until age 70 for the primary wage-earner and uses the IRS required minimum distribution (RMD) to calculate income from savings.

We call this strategy the "SS/RMD Strategy" for professional audiences, and the "*Spend Safely in Retirement Strategy*" for worker and consumer audiences.

The best way for an older worker to implement the *Spend Safely in Retirement* Strategy is to work just enough to pay for living expenses until age 70 in order to enable delaying Social Security benefits. In essence, “Age 70 is the new 65.” To make this method work, retirees may also need to significantly reduce their living expenses. We acknowledge there can be serious challenges for older Americans who choose to work longer.

If a worker isn’t willing or able to delay retirement, the next best way to implement the *Spend Safely in Retirement* Strategy is to use a portion of savings to enable delaying Social Security benefits as long as possible but no later than age 70. They would then invest their remaining savings and use the RMD to calculate their lifetime retirement income that’s generated by their savings. While analyzing this latter approach, we assumed the worker retires at age 65 but uses a portion of savings to enable starting Social Security at age 70.

With remaining savings (after optimizing Social Security), we assumed retirees would use the RMD to calculate retirement income, starting at age 65. The IRS rules dictate the minimum withdrawal starting at age 70-1/2; at that age, the account balance in taxable retirement accounts (such as traditional IRAs and 401(k) accounts) is divided by the participant’s life expectancy to determine the minimum required withdrawal amount for the coming year. The RMD requires this amount to be withdrawn from the account and included in taxable income for the year.

The purpose of the RMD is for the federal government to capture taxable income from retirement accounts. It wasn’t devised as a spend-down strategy, although our analyses show that it happens to meet common retirement planning goals.

The RMD life expectancy tables can be translated into a series of withdrawal percentages. At age 70, the initial withdrawal percentage is 3.65%, and it increases each year thereafter. We assumed a withdrawal percentage of 3.5% from ages 65 to 70, although a more precise method could also be used (by dividing the account balances by the life expectancies in the RMD tables). See the Appendix for a table of the RMD withdrawal percentages.

For married couples, the optimal strategy for claiming Social Security for the spouse who isn’t the primary wage earner typically depends on individual circumstances. Often the optimal strategy for this spouse calls for starting benefits somewhere between the full retirement age (currently age 66) and age 70. For our analyses, we assumed the spouse who isn’t the primary wage earner would start Social Security at age 66.

The primary disadvantage of using savings to enable delaying Social Security benefits is that it can substantially reduce the amount of remaining assets and liquidity throughout retirement. This disadvantage must be weighed against the potential for permanently increased, guaranteed retirement income from a delay strategy.



## Advantages of the *Spend Safely in Retirement* Strategy

Our analyses show that the *Spend Safely in Retirement* Strategy has many key advantages, as follows:

- It produces more average total retirement income expected throughout retirement compared to most solutions we analyzed.
- It automatically adjusts the RMD withdrawal amounts to recognize investment gains or losses. Withdrawals are increased after years with favorable returns, and vice versa.
- It provides a lifetime income, no matter how long the participant lives, and it automatically adjusts the RMD withdrawal each year for remaining life expectancy.
- It projects total income that increases moderately in real terms, while many other solutions aren't projected to keep up with inflation. The *Spend Safely in Retirement* Strategy produced projected real increases in income of up to 10% over the retirement period.
- It produces a moderate, compromise level of accessible wealth for flexibility and the ability to make future changes. It produces higher accessible wealth compared to strategies that use annuities. It provides less accessible wealth than strategies that maximize flexibility, such as SWPs with low withdrawal rates and/or strategies that don't use savings to enable the delay of Social Security benefits.
- It provides a moderate, compromise level of bequests, for the same reasons listed above.
- It produces low measures of downside volatility, with potential future annual reductions in spending typically well under 3%, which is hopefully a manageable amount.
- It gives older workers the flexibility to transition from full-time work to part-time to full retirement.

The *Spend Safely in Retirement* Strategy has another significant advantage: It can be readily implemented from virtually any IRA or 401(k) plan without purchasing an annuity. Many administrators can calculate the RMD and automatically pay it according to the frequency elected by the retiree.

Several analysts have studied the RMD as a drawdown strategy, and they have concluded it's a viable way to produce a stream of lifetime retirement income.<sup>17,18,19,20</sup> These studies typically analyzed the RMD solution in isolation, not considering the value of Social Security benefits. Once again, by using a total retirement portfolio approach that includes Social Security income, our analyses amplify the importance of the analyses prepared by these researchers.

Our analyses show that the *Spend Safely in Retirement* Strategy has many key advantages compared to more complex solutions, including simplicity and ease of implementation.

## Building a "retirement transition bucket"

In the years leading up to retirement, an older worker might want to use a portion of their retirement savings to build a "retirement transition bucket" that enables them to delay Social Security benefits. While there's some judgment involved with the necessary size of this bucket, a starting point would be an estimate of the amount of Social Security benefits the retiree would forgo during the delay period. The retirement transition bucket can also provide a buffer if the older worker is uncertain about the timing of retirement, and it could protect the worker against stock market crashes in the period leading up to retirement.

## Investing with the *Spend Safely in Retirement* Strategy

The retirement transition bucket could be invested in a liquid fund with minimal volatility in principal, such as a money market fund, a short-term bond fund, or a stable value fund in a 401(k) plan. This type of fund could protect a substantial amount of retirement income from investment risk as the worker approaches retirement, since the retirement transition bucket would be invested in stable investments and Social Security isn't impacted by investment returns.

Using a low-cost balanced fund, target date fund, or stock index fund can significantly simplify retirement investing.

Our analyses support investing the RMD portion significantly in stocks – up to 100% – if the retiree can tolerate the volatility. The resulting volatility in the total retirement income portfolio is dampened considerably by the high proportion of income produced by Social Security, which doesn't drop if the stock market drops. However, our analyses project reasonable results with a typical target date fund for retirees (often a 50% stock allocation) or balanced fund (often a 60% stock allocation), and these funds are commonly available in IRA and 401(k) platforms. These lower stock allocations would reduce expected income but would also produce lower downside volatility, compared to a 100% stock allocation.

These results can significantly simplify retirement investing; to implement this strategy, a retiree could select a low-cost index fund, whether it's a target date, balanced, or stock fund. Many 401(k) plans, as well as many IRA providers, already offer low-cost index funds as part of their investment choices.

## Refinements to the *Spend Safely in Retirement* Strategy

The *Spend Safely in Retirement* Strategy can be a starting point for devising retirement income strategies, with refinements implemented to meet other retirement planning goals and to personalize the solution to individual circumstances.

First, it's recommended that retirees maintain an emergency fund that would not be used to generate retirement income. Such a fund could be used to pay for planned large, one-time purchases, or for large unforeseen expenses, such as house repairs.

Also, some retirees express a desire to spend more money in their early years of their retirement while they're active and healthy, often for travel expenses. In this case, they could dedicate a portion of their retirement savings to a special bucket for these purposes; this bucket would also not be used to generate retirement income. For example, if a retiree plans to spend an extra \$5,000 per year on travel for each of 10 years, they could set aside \$50,000 that's not used to generate retirement income and withdraw from this savings bucket to pay for their travel expenses.

Another refinement might be appropriate for retirees who desire more guaranteed income than produced by the *Spend Safely in Retirement* Strategy. In this case, they could use a portion of their savings to purchase a low-cost SPIA, GLWB, or FIA, as described previously. Another possibility, if the retiree has significant home equity, could be to use a tenure payment reverse mortgage to generate additional monthly income.

If a worker is unable or unwilling to work longer to postpone drawing Social Security benefits, one possible financial strategy would be to use a reverse mortgage line of credit as a pool of funds to help cover living expenses while delaying Social Security benefits.

Finally, the *Spend Safely in Retirement* Strategy works best when a retiree delays Social Security until age 70, but delays until earlier ages, such as 67, 68, or 69, still provide significant advantages.

## Communicating the *Spend Safely in Retirement* Strategy

To communicate the *Spend Safely in Retirement* Strategy, plan administrators and advisors should characterize Social Security as a secure monthly "retirement paycheck" that a retiree might use to pay for basic living expenses. They should characterize the RMD withdrawals as a variable annual "retirement bonus" that can fluctuate, which can be used to pay for discretionary living expenses. Many middle-income workers are accustomed to managing their finances with secure paychecks and variable bonuses, so it's natural to continue this financial discipline in retirement.

The *Spend Safely in Retirement* Strategy emphasizes that it's smart for retirees to:

- Delay drawing down Social Security and retirement savings. For workers with modest retirement savings, it's essential to squeeze every dollar out of available retirement resources.

- Automate the payment of retirement income, which will be very helpful for older retirees when they reach their 80s and 90s and are less interested in managing their finances.
- Use low-cost index funds for invested savings.
- Phase from full-time to part-time to full retirement. The “right transition” will be unique to each retiree’s circumstances and goals.
- Adjust withdrawals from savings for investment gains and losses throughout retirement.
- Maintain some accessible savings to respond to changes in circumstances throughout retirement.

As such, the *Spend Safely in Retirement* Strategy can be characterized as a navigational guide to help older workers decide when to retire and how to deploy their retirement savings.

## The *Spend Safely in Retirement* Strategy can be the default retirement income option

Auto-enrollment and default investment options have demonstrated the power of default elections for accumulating savings. As a result, analysts have been seeking a default payout option that can be utilized for retiring workers to improve retirement outcomes.

The RMD, combined with the plan’s qualified default investment alternative (QDIA), might be a viable default retirement solution that offers fiduciary protection to the plan sponsor. Using the RMD as a payout strategy complies with IRS regulations; the retiree will incur substantial penalties if the minimum amounts aren’t withdrawn from the plan. As a result, both retirees and plan sponsors have a significant incentive to comply with the RMD. In addition, our analyses show that the RMD helps maximize expected retirement income.

The RMD, combined with the plan’s qualified default investment alternative (QDIA), might be a viable default retirement solution that offers fiduciary protection to the plan sponsor.

As a refinement or alternative to the default solution, a retiree can make a positive election to meet various retirement planning goals, such as deploying a portion of retirement savings to build their retirement transition bucket, starting withdrawals before age 70-1/2, or electing another payout option.

## The *Spend Safely in Retirement* Strategy won’t compensate for inadequate savings and other risks

By itself, the *Spend Safely in Retirement* Strategy won’t compensate for inadequate retirement savings as mentioned at the beginning of this article. However, that’s not a criticism of the *Spend Safely in Retirement* Strategy, since our comparisons show that other retirement income solutions will deliver equal or less retirement income.

Our analyses show that the *Spend Safely in Retirement* Strategy helps address modest savings by squeezing as much income as possible from existing resources. Furthermore, our analyses show that many older American workers may fall short of typical retirement income goals that are commonly advocated by planners, such as targeting a retirement income that equals 70% to 90% of preretirement pay. This goal may



be unattainable for many older workers, given the prevalent levels of savings for older workers. Such retirees may need to live on incomes that fall short of these goals.

Also, the *Spend Safely in Retirement* Strategy won't address other retirement planning risks, such as the cost of high medical expenses or long-term care. Once again, this isn't a shortcoming of the *Spend Safely in Retirement* Strategy, since most other retirement income solutions don't address these risks either. One smart risk management strategy is to convert large, unexpected medical costs into predictable monthly premiums through Medicare and Medicare supplement policies, which can then be paid from retirement

An expensive long-term care event can overwhelm most retirement income strategies and rapidly drain savings. Addressing this risk calls for separate strategies, such as purchasing long-term care insurance, holding home equity in reserve, and/or dedicating a separate investment account solely to long-term care expenses and not using it to generate retirement income.

Our analyses show that most middle-income retirees will experience significant decreases in their marginal federal income tax bracket in retirement.

Our analyses show that most middle-income retirees will experience significant decreases in their marginal federal income tax bracket in retirement, commonly falling from a 25% bracket to a 15%, 10%, or even a 0% bracket. This results from:

- Low levels of taxable income generated by modest retirement savings,
- The extra federal income tax deduction for taxpayers age 65 and older, and
- Part or all of Social Security benefits being excluded from taxable income.

As a result, strategies to minimize income taxes should take a lower priority compared to maximizing expected income and liquidity. In fact, since Social Security benefits enjoy unique tax benefits, maximizing Social Security benefits will help reduce retirees' income taxes.

Note that the observations on taxes apply to the income tax rules in effect in 2017, which are subject to change.

## Future research can provide useful insights

Future research could help various stakeholders understand:

- Circumstances when the *Spend Safely in Retirement* Strategy could be most helpful, by examining retirement ages different from age 65, Social Security start dates other than age 70, and various hypothetical employees,
- Refining the strategy for married couples,
- Modifying the strategy to address possible future reductions in income (for example, income from working that eventually stops) or future reductions in living expenses (for example, paying off a mortgage),
- The prevalence and number of older workers who could be helped by the strategy, and
- Communication strategies to encourage implementation among middle-income retirees.

Future research could also explore another possible advantage of the *Spend Safely in Retirement* Strategy: Plan sponsors could prepare retirement income statements for DC plan participants that don't involve making assumptions about interest rates or product features. Retirement income statements can help older workers understand their expected retirement income, which will help them decide when they can afford to retire.

In addition, future research could explore considerations for building the retirement transition bucket to enable delaying Social Security benefits, as well as help with a smooth transition from full-time work to part-time work to full retirement.

## **The *Spend Safely in Retirement* Strategy helps with important life decisions**

The *Spend Safely in Retirement* Strategy represents a straightforward way for middle-income workers with between \$100,000 and \$1 million in savings to generate a stream of lifetime retirement income without purchasing an annuity and without significant involvement from financial advisers. This group might represent as many as half of all workers age 55 and older, based on the numbers at the beginning of this article.

The *Spend Safely in Retirement* Strategy can also help older workers make important life decisions, such as how long they should continue to work full time, whether they should transition into retirement with part-time work, when they can fully retire, and how much money they can spend in retirement.

I've been studying retirement for my entire professional career, and at age 64, I've been thinking seriously about my own retirement. This actuary will be using a version of the *Spend Safely in Retirement* Strategy, based on my 30+ years of study. My life-long quest may just be coming to an end!

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*Note: The full report, *Optimizing Retirement Income by Integrating Retirement Plans, IRAs, and Home Equity: A framework for evaluating retirement income decisions*, contains details on the above analyses and conclusions, other results, graphs, and tables that present our analyses, and details on our assumptions and methods. The co-authors of the study are Wade Pfau, PhD., Joe Tomlinson, FSA, and Steve Vernon, FSA.*

*The full report can be found at: <http://longevity.stanford.edu/scl-publications/>*



**Figure 1: Start with solutions near the efficient frontier**

- Each symbol represents a retirement income strategy for a 65-year-old single female with \$250,000 in retirement savings.
- The vertical axis is the average amount of total annual real retirement income expected over the retirement period.
- The horizontal axis is the average real amount of accessible wealth expected over the retirement period.

## RETIREMENT INCOME DASHBOARD

No deployment of home equity

Retiree #2: 65-year old married couple with \$400,000 in savings

Set 4: Compare high-performing solutions near the efficient frontier



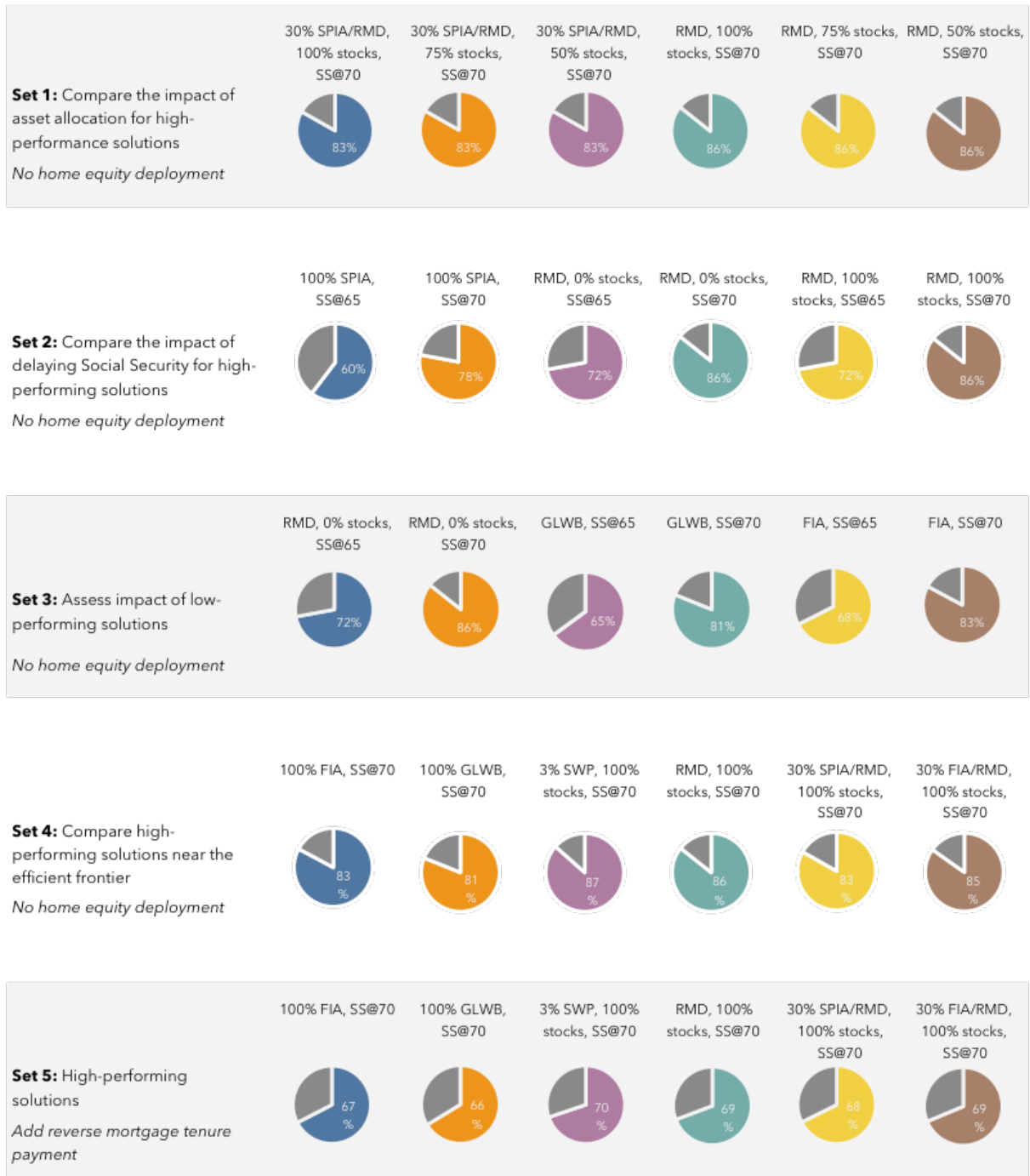
**Figure 2: Sample dashboard comparing various retirement income solutions for a 65-year-old married couple with \$400,000 in retirement savings.**



## RETIREMENT INCOME DASHBOARD

### Percent of Initial Retirement Income Provided by Social Security

Retiree #2: 65-year old married couple with \$400,000 in savings



**Figure 3. For various retirement income solutions, Social Security (the non-gray portion of each graph) delivers 60% to 86% of the total retirement income. The chart is representative of the results for a married couple, both age 65, with \$400,000 in savings.**

## Appendix: Withdrawal percentages under the IRS Required Minimum Distribution

Age	Distribution period in years	Minimum payout rate
70	27.4	3.65%
71	26.5	3.77%
72	25.6	3.91%
73	24.7	4.05%
74	23.8	4.20%
75	22.9	4.37%
76	22.0	4.55%
77	21.2	4.72%
78	20.3	4.93%
79	19.5	5.13%
80	18.7	5.35%
81	17.9	5.59%
82	17.1	5.85%
83	16.3	6.13%
84	15.5	6.45%
85	14.8	6.76%
86	14.1	7.09%
87	13.4	7.46%
88	12.7	7.87%
89	12.0	8.33%
90	11.4	8.77%

### Notes:

- The RMD table continues beyond age 90.
- Use the account holder's age on their birthday during the calendar year.
- If the account holder is married and their spouse is more than 10 years younger, a different table with payout rates that are lower than the above rates applies.

## Citations

1. *Retirement Confidence Survey*, Employee Benefit Research Institute, March 2017.
2. *Is Home Equity an Underutilized Retirement Asset?* Boston College Center for Retirement Research, March 2017.
3. *17th Annual Retirement Survey*, Transamerica Center for Retirement Studies, December 2016.
4. *2017 Defined Contribution Trends*, Callan Institute.
5. *2017 Hot Topics in Retirement and Financial Wellbeing*, AonHewitt.
6. *Automatic Enrollment, Employer Match Rates, and Employee Compensation in 401(k) Plans*, Monthly Labor Review, Bureau of Labor Statistics, May 2015.
7. *Pulse Survey: The Impact of Automatic Enrollment*, Aon Hewitt, January 2015.
8. *Risks and Processes of Retirement Survey*, Society of Actuaries. 2015 survey (eighth edition) published January 2016.
9. *Spending the Nest Egg – Retirement Income Decisions Among Older Investors*, Vanguard, 2008.
10. *A Retirement Literacy Quiz You Need to Pass*, by Steve Vernon. CBS MoneyWatch, May 2017.
11. *Optimizing Retirement Income by Integrating Retirement Plans, IRAs, and Home Equity: A framework for evaluating retirement income decisions*, by Steve Vernon, Wade Pfau, and Joe Tomlinson. Stanford Center on Longevity/Society of Actuaries, October 2017.
12. *When Should You Claim Social Security*, by Dr. Wade Pfau. 2015.
13. *Retirement Income Scenario Matrices*, by Dr. William Sharpe. Stanford University, 2017.
14. *The Decision to Delay Social Security Benefits: Theory and Evidence*, by Dr. John Shoven, Stanford University, and Dr. Sita Slavov, George Mason University. 2012.
15. *Innovative Strategies to Help Maximize Social Security Benefits*, by James Mahaney FSA. 2017.
16. *Get What's Yours: The Secrets to Maxing Out Your Social Security*, by Laurence J. Kotlikoff, Phillip Moeller, and Paul Selman. 2016.
17. *Coping with Sequence Risk: How Variable Withdrawal and Annuitization Improve Retirement Outcomes*, by Joe Tomlinson. September 2017.
18. *Retirement Spending and Required Minimum Distributions*, by Dr. Wade Pfau. November 2016.
19. *Can Retirees Base Wealth Withdrawals in the Required Minimum Distribution*, by Wei Sun and Anthony Webb. October 2012.
20. *Optimal Withdrawal Strategy for Retirement Income Portfolios*, by David Blanchett, Maciej Kowara, and Peng Chen. 2012.