

Beyond the Retirement Crisis Headlines: Why Employer-Sponsored Plans Are the Key to Retirement Adequacy for Today's Workers

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Executive Summary

This report analyzes the likelihood that today's US workers will have adequate financial resources in retirement using the new Morningstar Model of US Retirement Outcomes. This model simulates retirement income adequacy for a representative sample of all US households, whether they are covered by an employer-sponsored retirement plan or not. It differs from many of the other models used for public policy research on retirement topics by incorporating a stochastic decumulation module that allows for explicit modeling of many of the most important postretirement considerations, such as longevity risk, investment risk, and the risk of catastrophically expensive long-term services and supports, as opposed to simply computing a replacement rate at retirement and then assuming those above a certain threshold will have a successful retirement.

Key Findings

- ▶ **Defined-Contribution Plan Importance:** Participation in employer-sponsored retirement plans significantly improves retirement outcomes. Workers without access to these plans are much more likely to experience shortfalls.
- ▶ **Generational Disparity:** Baby boomers and Generation Xers face a higher risk of retirement shortfalls due to shorter accumulation periods for savings, among other factors.
- ▶ **Socioeconomic Disparity:** Lower-income workers are at a considerably higher risk of retirement insecurity. Race and ethnicity also play a role, with Hispanic and Black Americans more likely to experience shortfalls.

This research highlights the vulnerability of certain demographics to retirement shortfalls and underscores the importance of defined-contribution plans in retirement preparedness. Policies should encourage access to and participation in employer-sponsored retirement plans, especially for younger and lower-income workers. This research will also serve as the baseline for future publications that will assess the impact of various legislative and regulatory proposals as well as provide valuable insights into the likely consequences of plan design modifications.

Background and Introduction

This article uses the new Morningstar Model of US Retirement Outcomes to delve into the ongoing debate regarding the potential for a future retirement crisis for today's workers within the United States.¹ Proponents of the crisis narrative highlight concerning trends such as relatively low personal savings rates² and the increasing prevalence of defined-contribution plans (such as 401(k)s), which shift the onus of retirement planning onto individuals.³ Additionally, rising healthcare costs⁴ and increased life spans⁵ are seen as factors that exacerbate the financial burden of retirement.

However, those who challenge the notion of a future crisis point to the existence of various retirement income sources beyond individual savings, including Social Security and pensions. Furthermore, concerns are raised regarding the potential overestimation of retirement needs in some studies, which do not account for reduced postretirement expenditures. Finally, positive trends in retirement plan participation and automatic enrollment features are presented as evidence of improvement in the overall landscape.

There have been two excellent reviews of the literature with respect to this topic.⁶ While they both provide an exhaustive comparison of the pros and cons of the models at that time (especially with respect to the limitations of models using replacement rates as an output metric),⁷ it is clear that only a micro-simulation model with stochastic modules for both the accumulation and decumulation phases can accurately assess the prospects of future retirement income adequacy for today's workers.

This is perhaps best summarized by Mackenzie (p. 68):⁸

Notwithstanding the sophistication of [other models] EBRI's [the Employee Benefit Research Institute] model is the gold standard of retirement risk modeling. It takes explicit account of investment and sequence-of-returns risk, and because it does not annuitize all assets at retirement, it then can track the relationship between longevity and the risk of running out of money. Its painstaking modeling of 401(k) contributions allows it to undertake policy simulation exercises of changes to the rules governing these plans.

1 There are several excellent studies that investigate whether current retirees are likely to have adequate retirement income (Brady and Bass, 2023; Hurd and Rohwedder, 2011).

2 The median deferral rate for Vanguard participants was 6.2 percent in 2023. Vanguard (2024)

3 However, several simulation studies have shown that when realistic job turnover is considered, 401(k) plans produce superior results compared with final average defined-benefit plans for a majority of the sample population (see VanDerhei June 2013, VanDerhei December 2013, VanDerhei 2015, and VanDerhei February 2019).

4 See Schieber (2015) for a discussion of how catastrophic long-term-care risks factor into this assessment.

5 For example, refer to the first exhibit: https://www.aon.com/attachments/human-capital-consulting/Society_of_Actuaries_Finalizes_New_Mortality_Assumptions-final.pdf.

6 Bajtelsmit and Rappaport (2018) and Mackenzie (2020).

7 For example, the National Retirement Risk Index (NRRI) from the Center for Retirement Research at Boston College starts by projecting a replacement rate for each SCF household ages 30-59. <https://crr.bc.edu/the-national-retirement-risk-index-version-2-0/>

8 These comments apply to the version of the EBRI model (Retirement Security Projection Model®) in use prior to 2022. See VanDerhei and Copeland (2010) for more detail. Future versions may have different approaches.

However, he also raises an issue with the way the EBRI model treated the consumption expenditure, noting that the use of the Consumer Expenditure Survey to forecast expenses may provide inaccurate estimates.

We decided to adopt a similar conceptual approach to constructing the Morningstar Model of US Retirement Outcomes; however, several major differences exist:

- ▶ **A stochastic decumulation module based on the Health and Retirement Study and the Consumption and Activities Mail Survey.** Although the EBRI model used the best datasets available when it was created in the late 1990s, there have been remarkable advances in the detail available in publicly available datasets since then. Of particular note is the Health and Retirement Study, or HRS, and the Consumption and Activities Mail Survey, or CAMS, supplement. The Morningstar Model of US Retirement Outcomes uses these datasets to simulate health states and retirement expenses. Elaborating on the former, the health state of each household member is simulated during retirement with a health state transition model based on longitudinal HRS data. The model includes states wherein the household member goes into home healthcare or enters a nursing home. Retirement expenses consist of two elements: 1) standard expenses assuming no long-term services and supports, or LTSS, costs and 2) LTSS expenses. The standard expenses are dynamic in the projection, generally decreasing over time. LTSS expenses are stochastic and only occur in cases wherein a household member is in either home healthcare or a nursing home.
- ▶ **Use of SCF instead of CPS to simulate households in the model.** The EBRI model was originally designed to estimate retirement income adequacy for individual states.⁹ This required the use of the Current Population Survey, or CPS, to provide that level of detail. In contrast, the Morningstar Model of US Retirement Outcomes uses the Survey of Consumer Finances, or SCF, sample to populate the model. This provides the ability to directly integrate a substantial amount of household asset/liability and income information into the simulation as well as a direct integration of existing defined-benefit coverage and previous accruals. The use of SCF as opposed to CPS is especially important with respect to the integration of balances from defined-contribution plans and IRAs as well as information on net housing equity.
- ▶ **Use of plan-specific details to estimate employee-contribution behavior in defined-contribution plans.** With the exception of a joint project with the Defined Contribution Institutional Investment Association,¹⁰ any employee-contribution analysis in previous versions of RSPM was limited by the lack of plan design information. In contrast, the developers of the Morningstar Model of US Retirement Outcomes had access to participant-level time series information from approximately 1,000 defined-contribution plans as well as information on plan type, whether each plan used voluntary or automatic enrollment, default deferral levels, automatic escalation provisions, and formulae for employer matching contributions and/or nonelective contributions.¹¹

⁹ VanDerhei and Copeland (2001b).

¹⁰ DCIIA (2017)

¹¹ See VanDerhei and Copeland (2001a) and Greig et al. (2024) for examples of how important the match formulas are.

We expand on the methodology of the Morningstar Model of US Retirement Outcomes later in this paper. We also have a separate technical appendix.¹²

Motivations for Creating the Morningstar Model of US Retirement Outcomes

There are several key motivations for creating a stochastic simulation program to determine retirement income adequacy for today's workers:

Creating a baseline scenario to establish the likelihood that today's workers will have adequate resources at retirement. The results are broken down by age, wage, family status, gender, race and ethnicity, industry, and future years of coverage in a defined-contribution plan.

Running sensitivity analysis around key assumptions to see how robust the findings are. Although we use state-of-the-art assumptions for future returns from the capital markets, the actual results will depend to a large degree on future labor market trends as well. For example, if job change (and the attendant possibilities of cash outs from defined-contribution plans) were to increase, the prospects for retirement income adequacy would diminish in the absence of some type of full auto-portability system. In future publications we will "stress test" the assumptions in the baseline version of the model.

Test the impact of legislative and regulatory proposals on the retirement income adequacy prospects for today's workers. It is useful to have a comprehensive simulation model to assist in the evaluation of legislative and regulatory proposals to modify the current retirement system. For example, the Automatic Contribution Plan/Arrangement proposal that was considered in 2021 would generally require employers with more than five employees to maintain an automatic contribution plan/arrangement; however, sponsors with certain previous plans would be grandfathered. Using the RSPM model, EBRI was able to provide a comprehensive analysis of the potential impact on retirement income adequacy for all US households.¹³ The Morningstar Center for Retirement and Policy Studies plans to use the Morningstar Model of US Retirement Outcomes, henceforth referred to as the Model, to offer assistance to relevant parties in evaluating the impact of these proposals as they are being developed.

Analyze the impact of plan design. The Model will be valuable for use in determining the likely impact of plan design modifications on employees as well as employers. During the accumulation period, the Model can be used to evaluate the potential impact of moving from a voluntary enrollment defined-contribution plan to one that uses automatic enrollment,¹⁴ as well as the likely increase in cost of additional employer contributions to a plan sponsor. During the decumulation process, the Model can be used to evaluate various lifetime income options such as Qualified Longevity Annuity Contracts,¹⁵ single-premium immediate annuities, deferred-income annuities, and annuities with a guaranteed lifetime

¹² Refer to technical appendix

¹³ VanDerhei (2022)

¹⁴ VanDerhei (2010)

¹⁵ See, for example, VanDerhei (2018).

withdrawal benefit.¹⁶ Moreover, the value of managed accounts will be analyzed from several aspects, including modifications in asset allocation and employee contributions as well as changes in withdrawal rates prior to retirement and the use of lifetime income products after retirement.

Morningstar Model of US Retirement Outcomes Framework

The Morningstar Model of US Retirement Outcomes is a quantitative framework to evaluate retirement income adequacy in the United States. The Model produces a distribution of financial outcomes in retirement for each household (focusing on the main respondent and their spouse, if applicable) in the Survey of Consumer Finances. The Model uses 2022 SCF data as inputs for each household, such as age, gender, race and ethnicity, balances in financial accounts, salary, and other job-related information. Note that we assume a baseline retirement age of 65 in this analysis, but we conduct sensitivity testing on this assumption later in the paper.

The Model projects retirement outcomes for each household across 1,000 independent scenarios with the projection going to age 120.¹⁷ Household members are not assumed to pass away at a specific age. Instead, death ages are modeled stochastically. Before retirement starts, the Model simulates whether death occurs based on Social Security cohort life tables. In retirement, the Model uses a health state transition model. Possible states include 1) good health, 2) poor health, 3) in-home healthcare, 4) in a nursing home, or 5) dead. The Model has specific states for LTSS because having to pay for LTSS is one of the biggest financial risks for retirees.

The Model leverages Morningstar salary curve methodology to estimate both forward- and backward-looking real wages. Before retirement, the Model simulates job change for each household member. Upon job change, the Model simulates whether the individual has a defined benefit, or DB, plan with their new job and the accrual rate if a DB plan exists. The Model also simulates (at job change) whether the individual has access to a defined-contribution, or DC, retirement plan and whether they participate. Moreover, the Model simulates what plan features are applicable, such as whether the plan has auto-enrollment or voluntary enrollment, and so on. The Model also simulates whether cash outs occur (that is, taking the account balance as a lump sum) when a household member leaves their job.

The Model incorporates realistic investor behavior into the simulation process. The most salient example is the contribution module. Instead of assuming a static savings rate, the Model simulates the contribution rate based on various individual factors (such as age, salary, and job tenure) and plan features.

The Model forecasts assets within investment accounts (which include any assets in pretax and Roth IRAs, pretax, post-tax, and Roth 401(k)s, and a post-tax account) to grow based on stochastic portfolio returns from Morningstar Investment Management's Time Varying Model. Refer to the Morningstar

¹⁶ For example, the type of analysis conducted by Look and Szapiro (2022) could be done on a large scale.

¹⁷ Age 120 is the stopping point in the projection because actuarial mortality tables generally end at this age.

Model of US Retirement Outcomes Technical Appendix for more information on the Time Varying Model.¹⁸

In terms of asset allocation, the Model uses a glide path that represents the industry consensus. While we do not assume a managed account is used in the baseline, we will examine their impact in a forthcoming publication using the Model. The fund fee used in the analysis is 0.39%, which is based on the median fee for mega plans according to a Morningstar report on the retirement plan landscape (refer to Mitchell and Szapiro, 2022). This assumption is also generally consistent with the findings in the Investment Company Institute's 2024 analysis of mutual fund fees (refer to Duvall and Johnson, 2024).

Once retirement commences, the Model estimates the household's retirement expenses. The expenses consist of two elements: 1) standard expenses assuming no LTSS costs and 2) LTSS expenses. As we mentioned in the introduction, the LTSS expenses are stochastic, only occurring when the Model simulates that an individual requires home healthcare or requires a nursing home.¹⁹ LTSS expenses are based on national median costs from Genworth's Cost of Care Survey.²⁰

Social Security benefits are estimated separately for each member of the household. The Model uses the estimated historical wages along with the individual's birth year, claim age (which is assumed to equal retirement age), and other Social Security data to calculate Social Security benefits. We assume status quo for Social Security in this analysis. Namely, we assume Social Security will be able to pay out full benefits in the future. However, we are planning to analyze the impact of Social Security reform in a future publication.

Every year in retirement, the Model adds up the guaranteed income from Social Security and pensions and deducts it from the simulated expenses. The household's investments, which grow based on the Time Varying Model's stochastic rates of return, are used to fund any leftover amount. The Model calculates both state²¹ and federal income taxes, which are added to the next year's required expenses. The Model also accounts for required minimum distributions.

If the household is unable to fully fund its projected expenses for the year, any net housing equity (which is estimated at the start of retirement and changes over time) is assumed to be liquidated and added to the post-tax investment account in the form of a lump-sum payment. Note that rental costs are added to the projected retirement expenses if this situation occurs in the Model.

The projected income, wealth, and expense cash flows are converted from a nominal basis to an inflation-adjusted, or real, basis. The metric we focus on herein is the retirement-funded ratio. The

¹⁸ The Time Varying Model forecasts returns for many global asset classes over a long time horizon. Refer to the technical appendix.

¹⁹ We do not dedicate a specific health state for residential care (such as assisted living) in the health state transition model because a smaller percentage of Americans will require paid residential care; refer to Table 3 in Johnson (2019). We will monitor this assumption as more data becomes available.

²⁰ Cost of Care Survey | Genworth. From <https://www.genworth.com/aging-and-you/finances/cost-of-care.html>

²¹ The state of Virginia is used for the analysis. We used Virginia because it is somewhere near the middle when it comes to ranking states by taxes paid.

Model calculates the funded ratio for each of the 1,000 trials. The numerator is the sum of real (that is, inflation-adjusted) income across all retirement years plus any leftover assets at the time of death,²² if applicable. The denominator is the sum of real expenses (also across all retirement years). This metric shows the magnitude of the shortfalls, with retirement-funded ratios that are well below 1, indicating significant shortfalls. Refer to the Morningstar Model of US Retirement Outcomes Technical Appendix for more information on the Model's methodology.²³

Finding One: Assuming status quo for Social Security, baby boomers and Gen Xers are more likely to experience retirement shortfalls than other generations of today's workers.

We analyzed retirement adequacy across generations, assuming no changes to Social Security. We focused our analysis on cases wherein the retirement-funded ratio was less than 1 (as these are, by definition, a shortfall).²⁴ We found that baby boomers and Gen Xers are more likely to run short of money than those in other generations. In particular, we found that 47% of Gen Xers and 52% of baby boomers may experience retirement shortfalls, compared with 37% for Gen Z and 44% for millennials.²⁵ Results are displayed below in Exhibit 1.

Exhibit 1: Percentage of Americans Ages 20+ With Retirement-Funding Ratio Less Than Displayed Value by Generation

Funded Ratio	Gen Z	Millenials	Gen X	Baby Boomers	Aggregate
0.5	12%	12%	11%	14%	12%
0.6	16%	18%	16%	20%	17%
0.7	21%	24%	23%	27%	24%
0.8	26%	31%	31%	35%	31%
0.9	32%	37%	39%	44%	38%
1	37%	44%	47%	52%	45%
1.1	48%	56%	60%	63%	57%
1.2	56%	66%	71%	72%	67%
1.3	63%	72%	77%	78%	73%
1.4	68%	77%	82%	82%	78%
1.5	100%	100%	100%	100%	100%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. Note that the funded ratio 1.5 category includes results in which the funded ratio is above 1.5.

²² For households with two members, the time of the death refers to the second death.

²³ Refer to the technical appendix.

²⁴ Our simulated retirement expenses are dynamic in the projection. Non-LTSS expenses decrease or stay the same as retirement savings decrease, all else equal.

²⁵ We use the following definitions for generations. Gen Z: People in the labor force born in 1996 or after. Millennials: People born between 1980 and 1995. Gen X: People born between 1964 and 1979. Baby boomers: People born between 1946 and 1963.

The results for baby boomers and Gen X are in a large part already determined by their current level of retirement savings, as members of these generations do not have that much time left to save for retirement. Baby boomers and Gen Xers may have lower levels of retirement savings because they were impacted by the transition from a DB-dominant system to a DC-dominant system. Even within these two generations there are discrepancies, as baby boomers were more likely to experience the early portion of the transition, when the understanding of how to use a DC plan was not as developed as it is now. Additionally, products such as target-date funds and managed accounts, and DC plan features, such as auto-enrollment and auto-escalation, are more recent developments that have helped later generations better utilize DC plans compared with older generations when they were the same age.

It is also important to stress that these results assume status quo for Social Security. A study by VanDerhei and Copeland (2010) looked at a hypothetical Social Security reform plan.²⁶ As expected, people closest to retirement were not significantly affected. Those born in the early part of the baby-boomer generation would only see a small increase (0.3%) in the chance of having inadequate retirement income, but for later baby boomers and especially Gen X, the impact would be bigger. Because Gen Xers have more years of retirement affected by the cut, the study focused on how Social Security reform would impact them based on their income before retirement. The study found that the proposed benefit cut would have a harsher effect on lower-income earners. The group with the lowest income before retirement (the lowest-income quartile) would see a 7.2% increase in the chance of having inadequate retirement income. This increase was smaller for each higher-income group, with the wealthiest group (highest-income quartile) only seeing a 4.2% increase. Given the ongoing concerns around Social Security solvency, we plan on analyzing the impact of Social Security reform in a future publication, with a focus on Gen Z and millennial results.

Finding Two: There is a retirement crisis ... for those who do not or are unable to participate in a defined-contribution plan.

Next, we analyzed retirement funding ratios for Gen Z, millennials, and Gen X households, reviewing the results by the number of simulated years of future participation in a DC plan.²⁷ We found that retirement funding ratios were dramatically better for those who are simulated to participate in a DC plan for 10 or more years in the future. Specifically, we found that 57% of those not participating at all in a DC plan in the future may run short of money, compared with only 21%²⁸ for those with 20 or more years of future participation in a DC plan. Results are displayed in Exhibit 2 below.

²⁶ This plan wouldn't change current benefits until 2037, which is when a government report predicted the Social Security trust fund would run out of money. At that point, everyone's benefits would be permanently cut by 24%.

²⁷ We looked at future years of participation, as opposed to the total years of participation in a DC plan throughout a lifetime, because policymakers and other decision-makers can only influence the future.

²⁸ Even people with 20 or more years of future participation in a DC plan may undermine their retirement by, for example, taking preretirement withdrawals or cashing out upon job termination.

Exhibit 2: Percentage of Gen Z, Millennials, and Gen X With Retirement-Funding Ratio Less Than Displayed Value by Number of Years of Future Participation in a DC Plan

Funded Ratio	No Years in a DC Plan	1 to 9 Years in a DC Plan	10 to 19 Years in a DC Plan	20+ Years in a DC Plan
0.5	16%	12%	8%	4%
0.6	23%	18%	12%	6%
0.7	32%	25%	16%	9%
0.8	41%	33%	22%	12%
0.9	49%	41%	28%	16%
1	57%	48%	34%	21%
1.1	68%	62%	48%	30%
1.2	77%	72%	58%	39%
1.3	82%	78%	66%	46%
1.4	85%	83%	72%	53%
1.5	100%	100%	100%	100%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. This analysis is based on household members aged 20 years and over. Note that the funded ratio 1.5 category includes results in which the funded ratio is above 1.5.

Plan participation matters because Americans who participate in a DC plan are much more likely to save for retirement than workers who do not participate. For example, using the 2022 SCF, we noted that the average account balance (including retirement and nonretirement accounts)²⁹ for Americans currently saving in a DC plan was about 4 times higher than for those who were not saving into a DC plan.

Given the importance of participation in a DC plan, the retirement industry may want to focus on providing more Americans with access to an employer-sponsored plan. Currently, only about 52% of Americans have access to a retirement plan per Sabelhaus (2022). Policymakers have focused on this issue. For example, the Automatic Contribution Plan/Arrangement proposal mentioned previously would generally require employers with more than five employees to maintain an automatic contribution plan/arrangement. However, employers could satisfy this requirement by offering an auto-IRA without employer contributions. This means that most newly covered participants would likely end up with an auto-IRA since many employers who wanted to adopt a full-fledged 401(k) plan would have done so already. While this proposal would certainly help increase the number of employees covered by a plan, most newly covered participants would have a smaller total contribution than what they would have had if the employer had adopted a 401(k) plan.

²⁹ Nonretirement accounts refer to accounts in which contributions are made on a post-tax basis.

The industry may also want to focus on improving participation rates for those who already have access to a plan. For example, plan sponsors may want to consider adding auto-enrollment. Participation in plans with this feature was at 94% compared with just 67% for plans with voluntary enrollment, per Vanguard's How America Saves 2024 report.³⁰ Adding other features to the plan, such as a student loan match or an emergency savings account, may also boost participation.

While participation is the most important factor in retirement adequacy, the industry should continue to move towards auto-portability, wherein an individual's account with a former employer's DC plan is automatically transferred to the individual's account with a new employer-sponsored plan, assuming the individual does not opt out. We anticipate that auto-portability will lead to smaller retirement shortfalls because it should reduce cash-out rates. Cash outs, which refer to plan participants taking the account balance as a lump-sum cash payment when leaving their job, undercut the benefits of saving. Auto-portability may be especially helpful for workers with small balances because they are much more likely to cash out than workers with larger balances, according to a March 2018 Alight study. In a future publication, we will study the impact of both "partial" auto-portability (only balances under a certain threshold are automatically transferred) and "full" auto-portability (the impacts of cash outs are eliminated; see VanDerhei (August 2019) for additional detail). The retirement industry should also continue to focus on reducing other forms of plan leakage including hardship withdrawals and defaults on plan loans.

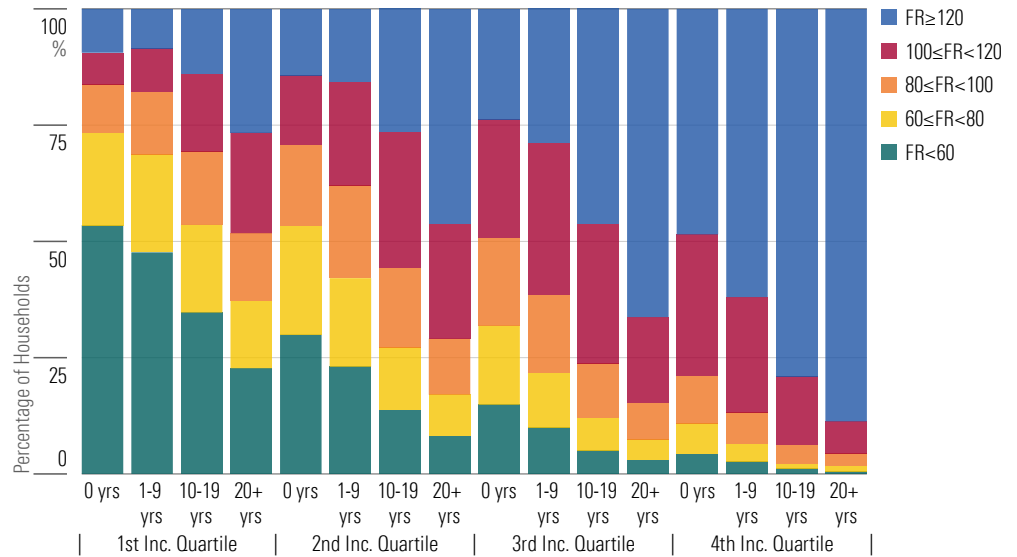
Finding Three: There is considerable dispersion in retirement outcomes with lower-income workers much more likely to experience shortfalls.

We reviewed retirement funding ratios for Gen Xers, millennials, and Gen Z across income quartiles and the number of years of future participation in a DC plan. Our income quartiles are based on the average indexed monthly earnings³¹ calculated for each household member as part of the Model's estimation of Social Security benefits. The results indicate that workers in the first two income quartiles are much more likely to run short of money in retirement. Namely, over 80% of households in the first income quartile with 0 years of future participation in a DC plan are projected to run short of money in retirement. However, retirement deficits for this income quartile are notably lower in cases in which household members are simulated to participate in a DC plan for 10 or more years. For example, focusing on the first income quartile, only about 52% of the households experienced retirement shortfalls when participating in a DC plan for 20 or more years. This finding reinforces the point we made earlier that the retirement industry should focus on improving plan access and plan participation. Results are displayed in Exhibit 3 below.

30 Refer to Figure 30 of Vanguard's "How America Saves 2024" report: https://institutional.vanguard.com/content/dam/inst/iig-transformation/insights/pdf/2024/has/how_america_saves_report_2024.pdf

31 Average indexed monthly earnings refer to a worker's average earnings, wherein wages are adjusted to account for differences in the standard of living over time. Social Security benefits are typically calculated using average indexed monthly earnings. Refer to <https://www.ssa.gov/oact/cola/Benefits.html>

Exhibit 3: Percentage of Gen Z, Millennials, and Gen X With Retirement-Funding Ratio Less Than Displayed Value by Number of Years of Future Participation in a DC Plan and Income Quartiles



Source: “FR” refers to the retirement funding ratio. Authors’ calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. This analysis is based on household members aged 20 years and over.

As a reminder, the Model calculates both standard expenses (which exclude LTSS costs) and LTSS expenses. Focusing on lower-income workers, the Model generally projects smaller standard expenses as our expense module explicitly incorporates a household’s income level when simulating expenses.³² Nonetheless, lower-income workers are still projected to run short of money primarily due to stochastic LTSS expenses.

Johnson (2019) analyzed the lifetime risk of needing and receiving LTSS with data from 1995 to 2014 with the Health and Retirement Study. He noted that 48% of adults who survive to age 65 will receive some type of paid LTSS (including Medicaid-financed nursing home care) over their lifetime. He also found that lifetime LTSS risks were similar across socioeconomic levels. To elaborate, individuals with more education and more financial resources live longer, which increases the lifetime risk of LTSS, but people with fewer financial resources are more likely to have paid LTSS needs each year. These two factors largely offset each other when it comes to lifetime LTSS risks.

Our health state transition model reflects these dynamics, projecting health states based on age, gender, income level, race and ethnicity, and marital status. While we do project LTSS needs for higher-income households, there is not a significant impact on retirement adequacy because these households typically have sufficient assets to cover the costs. Lower-income households, however, do not have extra savings to cover health shocks, meaning that one or two years of LTSS can often deplete their savings.

³² Age and marital status are also factored in.

The Secure 2.0 Act of 2022 introduced the Saver's Match program, which will begin in 2027. The new program will offer a 50% match on the first \$2,000 of retirement savings contributions for lower-income individuals who qualify. The Saver's Match may go a long way in addressing retirement adequacy for certain lower-income plan participants, especially Black women, as noted by VanDerhei (May 2024) through the Collaborative for Equitable Retirement Savings. We plan on expanding on this research in a future publication, focusing on the impact of the Saver's Match program on all US households, including those without a DC plan (the CFERS analysis focuses only on those who are participating in a 401(k) plan).

Finding Four: Hispanic and Black Americans are much more likely to run short of money than Americans of other race and ethnic backgrounds.

Focusing on the results from a race and ethnicity perspective, we found that Hispanic and non-Hispanic Black Americans were much more likely to experience retirement shortfalls than Americans from different race and ethnicity backgrounds. Specifically, approximately 61% of Hispanic Americans and 59% of non-Hispanic Black Americans are projected to run short of money (retirement-funded ratio less than 1). The results for non-Hispanic white Americans and non-Hispanic other Americans (which include Asian Americans) are significantly better, with only approximately 40% of both groups experiencing retirement shortfalls. Exhibit 4 below details the results.

Exhibit 4: Percentage of Americans Ages 20+ With Retirement-Funding Ratio Less Than Displayed Value by Race and Ethnicity

Funded Ratio	Hispanic	Non-Hispanic Black	Non-Hispanic Other	Non-Hispanic White
0.5	20%	20%	11%	10%
0.6	28%	27%	16%	14%
0.7	37%	35%	21%	20%
0.8	46%	43%	27%	26%
0.9	54%	51%	33%	33%
1	61%	59%	40%	40%
1.1	73%	70%	52%	53%
1.2	81%	79%	61%	63%
1.3	85%	84%	67%	70%
1.4	89%	88%	72%	75%
1.5	100%	100%	100%	100%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. Note that the funded ratio 1.5 category includes results in which the funded ratio is above 1.5.

These results are largely a function of the racial wealth gap, specifically the disparities in retirement account balances. As a reminder, we use household account balances from the 2022 SCF as an input in the projection. When looking at median retirement account balances from the 2022 SCF for households that have a balance greater than \$0, non-Hispanic white Americans have almost four times more saved than Hispanic and non-Hispanic Black Americans. When controlling for age, we still noted a significant savings gap across all generations. In particular, we observed that white baby boomers have over twice the savings of their Hispanic and non-Hispanic counterparts, with the gap widening to over five times for Gen Xers.

We also reviewed the results by race and ethnicity when controlling for level of income. We focused on those in the upper half of the distribution of income (again, based on each household member's average indexed monthly earnings from our Social Security module). We found that Hispanic and non-Hispanic Black Americans were still more at risk than non-Hispanic white Americans and non-Hispanic other Americans when controlling for income. Exhibit 5 contains the results.

Exhibit 5: Percentage of Americans Ages 20+ in Upper Half of Income Distribution With Retirement-Funding Ratio Less Than Displayed Value by Race and Ethnicity

Funded Ratio	Hispanic	Non-Hispanic Black	Non-Hispanic Other	Non-Hispanic White
0.5	7%	14%	5%	5%
0.6	11%	18%	8%	8%
0.7	16%	24%	12%	12%
0.8	22%	31%	17%	18%
0.9	30%	39%	22%	23%
1	40%	47%	28%	30%
1.1	57%	60%	40%	43%
1.2	69%	72%	50%	54%
1.3	76%	79%	57%	62%
1.4	81%	84%	63%	68%
1.5	100%	100%	100%	100%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. Note that the funded ratio 1.5 category includes results in which the funded ratio is above 1.5.

These results are consistent with findings from VanDerhei (March 2024), where, even after controlling for income and tenure, Black and Hispanic workers were found to have significantly lower retirement savings. The retirement industry may want to focus on ways to lessen the frequency and severity of preretirement withdrawals from DC accounts, as this is a major reason why Black and Hispanic workers have less retirement savings than their white counterparts. The Saver's Match program, which we

discussed above, may also improve results for Hispanic and Black Americans, particularly those with lower income, as noted by VanDerhei (May 2024).

Finding Five: About 45% of Americans will experience retirement-funding shortfalls, with females who are single at retirement more at risk than single males and couples.

Looking at results across all US households, we found that approximately 45% of Americans will run short of money in retirement. Moreover, we noted that about 55% of single females are projected to be at risk in retirement, compared with just 41% for couples and 40% for single males. Results are displayed in Exhibit 6 below.

Exhibit 6: Percentage of Americans Ages 20+ With Retirement-Funding Ratio Less Than Displayed Value by Family Status

Funded Ratio	Couple	Single Male	Single Female	Aggregate
0.5	7%	11%	22%	12%
0.6	11%	16%	29%	17%
0.7	17%	22%	36%	24%
0.8	24%	28%	43%	31%
0.9	32%	34%	49%	38%
1	41%	40%	55%	45%
1.1	56%	49%	63%	57%
1.2	68%	59%	71%	67%
1.3	74%	66%	76%	73%
1.4	79%	71%	80%	78%
1.5	100%	100%	100%	100%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. Note that the funded ratio 1.5 category includes results in which the funded ratio is above 1.5.

As we noted in other sections, a major factor behind these results has to do with the level of financial resources. Married couples and single males tend to have more savings than single females, which leads to smaller retirement deficits. Most couples also have two streams of Social Security benefits to rely on. Moreover, the surviving spouse may benefit from survivor benefits (Social Security or a pension).

Another factor is that women have longer life expectancies than men, all else equal. Living longer increases the lifetime risk of LTSS, meaning that women have a higher chance of needing to pay for care. In fact, Johnson (2019) found that women have a 55% probability of requiring paid LTSS after age 65, while men only have a 38% probability. This dynamic affects single women more than it does women who are part of a couple because, again, the latter tends to have more resources.

Finding Six: Retirement-funding ratios vary substantially by industry, with public-sector workers most prepared for retirement.

Next, we analyzed funding ratios across industries. We noted that the public sector is the most prepared for retirement, with only about 29% of workers in this industry projected to experience retirement shortfalls. The public sector is followed by the finance, insurance, and real estate industry, the miscellaneous services industry,³³ and the manufacturing industry. Results are displayed in Exhibit 7.

Exhibit 7: Percentage of Americans Ages 20+ by Industry With Retirement-Funding Ratio Less Than Displayed Value

Funded Ratio	Agriculture	Mining and Construction	Manufacturing	Wholesale and Retail Trade	Finance, Insurance, & Real Estate	Misc. Services	Public Sector
0.5	19%	8%	5%	15%	6%	7%	4%
0.6	27%	15%	10%	23%	10%	11%	7%
0.7	34%	22%	16%	31%	15%	17%	11%
0.8	41%	31%	23%	39%	21%	23%	16%
0.9	46%	39%	31%	47%	28%	31%	22%
1	51%	47%	39%	55%	35%	38%	29%
1.1	60%	61%	54%	67%	46%	52%	44%
1.2	67%	71%	66%	76%	56%	62%	56%
1.3	72%	77%	73%	81%	62%	69%	65%
1.4	75%	81%	78%	84%	67%	75%	72%
1.5	100%	100%	100%	100%	100%	100%	100%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes under the assumption that household members retire at 65. Household members are assumed to claim Social Security at retirement age. Note that the funded ratio 1.5 category includes results in which the funded ratio is above 1.5.

There are several key considerations behind these results. First, we noted that the industries with better retirement adequacy results were the industries with a larger share of employers sponsoring a retirement plan.³⁴ Indeed, the public sector is the industry with the highest likelihood of a worker having access to a retirement plan. Second, the results were better for industries wherein DB plans are more common. Again, the public sector stood out in this regard, as did the manufacturing sector and miscellaneous services sector. Third, income level across industries is also a driver of results. Income level is an important factor, impacting the level of contribution rates and the likelihood of having a DB plan (and the accrual rates). We observed that the finance, insurance, and real estate industry had the highest median income level, which helps explain why a smaller portion of those workers are projected to run short of money. Conversely, median income levels were lowest for the wholesale and retail trade industry, which helps account for why more workers in this industry are projected to experience shortfalls. Fourth, employer size also matters, as larger employers are more likely to provide retirement

³³ The miscellaneous services industry refers to a variety of professions.

³⁴ The Model factors in industry when simulating whether a worker has access to a DC or a DB plan upon job change.

benefits. In particular, we noted that the industry with the largest portion of workers projected to experience shortfalls—the agriculture industry—had the smallest median employer size.

Finding Seven: Only about 28% of US households would experience shortfalls if retiring at 70, compared with 45% if retiring at 65.

We conducted sensitivity testing to assess the impact of retiring earlier or later than our baseline retirement age of 65. Namely, we calculated retirement-funded ratios assuming a retirement age of 62,³⁵ 67, and 70. The results are intuitive, with retirement adequacy improving substantially at later retirement ages. Exhibit 8 below displays the results.

Exhibit 8: Percentage of Americans Ages 20+ With Retirement-Funding Ratio Less Than 1 by Retirement Age

Category	Couple	Single Male	Single Female	Aggregate
Retire at 62	50%	50%	64%	54%
Retire at 65	41%	40%	55%	45%
Retire at 67	34%	31%	47%	38%
Retire at 70	26%	21%	36%	28%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes. Household members are assumed to claim Social Security at retirement age.

While we acknowledge that many Americans are unable to or do not want to work later, the results show that Americans can benefit significantly from delaying retirement. There are multiple factors behind this result. First, working longer decreases the retirement time horizon, meaning that less savings is needed. Second, working longer also means there is more time for retirement savings to accumulate with the capital markets. Third, deferring Social Security benefits to normal retirement age or to age 70 dramatically boosts the amount of real income provided compared with claiming at age 62.

Next, we analyzed the different retirement age results by race and ethnicity, finding that Hispanic Americans and non-Hispanic Black Americans benefit the most from delaying retirement. In particular, we found that only 41% of Hispanic and 36% of non-Hispanic Black Americans will experience retirement shortfalls when retiring at 70, compared with 61% and 59%, respectively, when the retirement age is assumed to be to 65. Conversely, Hispanic and non-Hispanic Black Americans also had the worst retirement adequacy results when retiring at age 62. The results are displayed in Exhibit 9 below.

³⁵ In cases in which household members retire before age 65, we add Medicare Part B premiums to the projected expenses.

Exhibit 9: Percentage of Americans Ages 20+ With Retirement-Funding Ratio Less Than 1 by Race and Ethnicity

Category	Hispanic	Non-Hispanic Black	Non-Hispanic Other	Non-Hispanic White
Retire at 62	72%	70%	50%	49%
Retire at 65	61%	59%	40%	40%
Retire at 67	53%	49%	33%	34%
Retire at 70	41%	36%	23%	25%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes. Household members are assumed to claim Social Security at retirement age.

Finally, we reviewed the sensitivity results by income quartile. We noted that lower-income workers stand to benefit the most from delaying retirement, with 71% of Americans in the first income quartile projected to run short of money in the baseline (retire at 65) scenario compared with just 52% when retiring at age 70.

Exhibit 10: Percentage of Americans Ages 20+ by Income Quartile With Retirement-Funding Ratio Less Than 1

Category	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Retire at 62	80%	59%	47%	33%
Retire at 65	71%	48%	41%	23%
Retire at 67	64%	40%	36%	14%
Retire at 70	52%	29%	27%	8%

Source: Authors' calculations using v1.0 of the Morningstar Model of US Retirement Outcomes. Household members are assumed to claim Social Security at retirement age.

Overall, the results suggest that many Americans would benefit from delaying retirement, though again, we acknowledge that this is not a palatable or feasible option for many. We will explore more alternative scenarios in future publications, including an analysis in which retirees work part time at the beginning of retirement.

Conclusion

This study examines the prevalence and distribution of potential retirement income inadequacy among American workers using the Morningstar Model of US Retirement Outcomes. The Model is a simulation tool that considers individual characteristics (age, income, savings behavior, and so on), healthcare costs, and projected longevity to assess retirement income sufficiency. The Model is applied to a nationally representative sample. Our key findings include:

- A. Intergenerational Disparity: The analysis reveals a higher risk of retirement shortfalls for baby boomers and Gen X compared with younger generations. This might be attributed to shorter accumulation periods.
- B. Defined-Contribution Plans: Participation in employer-sponsored DC plans significantly improves retirement outcomes. Individuals without access to DC plans face a much greater likelihood of shortfalls.
- C. Socioeconomic Disparity: Lower-income workers, particularly millennials and Gen Z, demonstrate a considerably higher risk of retirement insecurity.

This research contributes to the ongoing debate on the US retirement system's sustainability. It utilizes a novel modeling approach to identify vulnerable populations and underscores the importance of DC plans and income disparity in retirement security.

The findings suggest a need for policies that promote access to and participation in DC plans, particularly for younger and lower-income workers. We believe the retirement industry can play a crucial role in mitigating potential retirement shortfalls for specific demographic segments.

In future research, we will explore the impact of broader economic factors and policy changes on retirement security outcomes, focusing on topics such as the Saver's Match, auto-portability, annuities, and other policy proposals to change or overhaul the 401(k) system. ■■

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