

## Retirement Savings Shortfalls: Evidence From EBRI's 2019 Retirement Security Projection Model®

By Jack VanDerheij, Ph.D., Employee Benefit Research Institute

---

### AT A GLANCE

Measuring retirement security — or retirement income adequacy — is an extremely important topic. EBRI launched a major project to provide this type of measurement in the late 1990s for several states concerned whether their residents would have sufficient income when they reached retirement age. A national model — the EBRI Retirement Security Projection Model® (RSPM) — was developed in 2003. New versions of the model have been generated periodically to include updates for financial and real estate market performance, employee demographics, and real-world behavior of 401(k) participants (based on a database of 27 million 401(k) participants) and IRA account holders (based on a database of 20 million unique individuals).

- For 2019, RSPM® finds that 40.6 percent of all U.S. households where the head of the household is between 35 and 64, inclusive, are projected to run short of money in retirement. That is down by 1.7 percentage points vs. 2014.
- The model finds that the *aggregate* retirement deficit American households in this age cohort face, taking into account current Social Security retirement benefits, is currently estimated to be \$3.83 trillion. The similar figure (adjusted for inflation) from 2014 was \$4.44 trillion.
- When pro-rata reductions to Social Security retirement benefits are assumed to begin in 2034, the aggregate retirement deficit increases by 6 percent to \$4.06 trillion.
- When looked at on an individual basis, the average Retirement Savings Shortfall for those ages 60–64 ranges from \$12,640 per individual for widowers to \$15,782 for widows. It increases to \$24,905 for single males and \$62,127 for single females.
- Defined contribution plan eligibility has a significant impact: The average retirement deficit for individuals ages 35–39 with no future years of eligibility in a defined contribution plan is \$78,046 per individual. This is more than five times the average retirement deficit for those fortunate enough to have at least 20 years of future eligibility in a defined contribution plan (where the average retirement deficit is \$14,638).
- The results also demonstrate the extreme importance of longevity risk in simulating Retirement Savings Shortfalls. Overall, the average retirement deficit for those in the longest relative longevity quartile is 10.2 times the average retirement deficit for those in the shortest relative longevity quartile.
- A 23 percent pro-rata reduction to Social Security retirement benefits beginning in 2034 would increase average retirement deficits by an average of 17 percent for those currently ages 35–39.
- Quantifying the retirement readiness of American households in this way provides valuable insight for employers, providers, and policymakers.

Jack VanDerhei is Director of Research at the Employee Benefit Research Institute (EBRI). This *Issue Brief* was written with assistance from the Institute’s research and editorial staffs. Any views expressed in this report are those of the authors and should not be ascribed to the officers, trustees, or other sponsors of EBRI, EBRI-ERF, or their staffs. Neither EBRI nor EBRI-ERF lobbies or takes positions on specific policy proposals. EBRI invites comment on this research.

**Copyright Information:** This report is copyrighted by the Employee Benefit Research Institute (EBRI). It may be used without permission but citation of the source is required.

**Recommended Citation:** Jack VanDerhei. “Retirement Savings Shortfalls: Evidence from EBRI’s 2019 Retirement Security Projection Model,<sup>®</sup>” *EBRI Issue Brief*, no. 475 (March 7, 2019).

**Report availability:** This report is available on the internet at [www.ebri.org](http://www.ebri.org)

## Table of Contents

Introduction .....	4
EBRI Retirement Security Projection Model <sup>®</sup> .....	4
Retirement Readiness Ratings .....	5
Retirement Savings Shortfalls .....	7
The Impact of Longevity on Retirement Savings Shortfalls.....	11
The Impact of Modifications in Social Security on Retirement Savings Shortfalls .....	11
Aggregate Deficits .....	11
Conclusion .....	13
References.....	14
Endnotes .....	14

## Figures

Figure 1, Average Retirement Readiness Rating, by Age Cohort: 2014, 2019 Baseline, and 2019 Adjusted for Social Security Reduction.....	6
Figure 2, Average Retirement Savings Shortfalls, by Age Cohort: 2019 vs. 2014 (Adjusted for Inflation) .....	6
Figure 3, Average 2019 Retirement Savings Shortfalls for Those Households With a Deficit, by Age Cohort .....	7
Figure 4, 2019 Retirement Savings Shortfalls, by Age Cohort and Marital Status/Gender .....	8
Figure 5, 2019 Retirement Savings Shortfalls, by Age Cohort and Preretirement Income Quartile .....	8
Figure 6, 2019 Retirement Savings Shortfalls, by Age Cohort and Years of Future Eligibility in Defined Contribution Plans .....	9
Figure 7, 2014 Retirement Savings Shortfalls (Adjusted for Inflation), by Age Cohort and Years of Future Eligibility in Defined Contribution Plans .....	10
Figure 8, 2019 Retirement Savings Shortfalls, by Preretirement Income Quartile and Years of Future Eligibility in Defined Contribution Plans .....	10

Figure 9, 2019 Retirement Savings Shortfalls, by Age Cohort and Relative Longevity Quartile..... 12

Figure 10, 2019 Retirement Savings Shortfalls and Percent Increase Relative to Baseline, by Age Cohort: Assumes Pro-Rata Reduction in Social Security Retirement Benefits (Starting in 2034) ..... 12

Figure 11, Retirement Savings Shortfall (Trillions of 2019 Dollars) for Households Headed by Individuals Ages 35–64: 2019 vs. 2014 (Adjusted for Inflation)..... 13

# Retirement Savings Shortfalls: Evidence from EBRI's 2019 Retirement Security Projection Model<sup>®</sup>

By Jack VanDerhei, Ph.D., Employee Benefit Research Institute

## Introduction

Measuring retirement security — or retirement income adequacy — is an extremely important topic. EBRI launched a major project to provide this type of measurement in the late 1990s for several states concerned whether their residents would have sufficient income when they reached retirement age. After conducting studies for Oregon, Kansas, and Massachusetts, a national model — the EBRI Retirement Security Projection Model<sup>®</sup> (RSPM) — was developed in 2003, and in 2010 it was updated to incorporate several significant changes, including the impacts of defined benefit (DB) plan freezes, automatic enrollment provisions for 401(k) plans, and the recent crises in the financial and housing markets.<sup>1</sup> New versions of the model have been generated on a periodic basis since then to include updates for financial and real estate market performance, employee demographics, and real-world behavior of 401(k) participants (based on a database of 27 million 401(k) participants) and individual retirement account (IRA) account holders (based on a database of 20 million unique individuals).

In 2014,<sup>2</sup> EBRI published extensive analysis from the last version of RSPM<sup>®</sup> that focused on the EBRI Retirement Readiness Ratings<sup>™</sup> (RRRs) — the probability that households will *not* run short of money in retirement. In 2015,<sup>3</sup> the earlier analysis was expanded by providing estimates of the Retirement Savings Shortfalls (RSS) — the size of the deficits that households are simulated to generate in retirement.

This publication provides the initial results from the 2019 version of RSPM<sup>®</sup>. It starts with a brief overview of RSPM<sup>®</sup> and compares the 2014 and 2019 RRR values. It then presents the average 2019 RSS values broken out by age cohorts, preretirement income quartiles, gender and family status, and years of future eligibility for participation in defined contribution (DC) plans. This is followed by an analysis of the impact of longevity on RSS. The impact of modification in Social Security benefits is then analyzed, and aggregate deficits are provided under two different scenarios. Conclusions are offered in the final section.

## EBRI Retirement Security Projection Model<sup>®</sup>

One of the basic objectives of RSPM<sup>®</sup> is to simulate the percentage of the population at risk of not having retirement income adequate to cover average expenses and uninsured health care costs (including long-term-care costs) at ages 65 or older throughout retirement in specific income and age groupings. RSPM<sup>®</sup> also provides information on the distribution of the likely number of years before those at risk run short of money, as well as the percentage of preretirement compensation they will need in terms of additional savings in order to have a 50, 70, or 90 percent probability of retirement income adequacy.

VanDerhei and Copeland (2010) describe how households are tracked through retirement age and how their retirement income/wealth is simulated for the following components:

- Social Security.
- DC balances.
- IRA balances.
- DB annuities and/or lump-sum distributions.
- Net housing equity.

A household is considered to run short of money in this model if aggregate resources in retirement are not sufficient to meet average retirement expenditures, defined as a combination of deterministic expenses from the Consumer Expenditure Survey (as a function of age and income) and some health insurance and out-of-pocket, health-related expenses, plus stochastic expenses from nursing-home and home-health care (at least until the point such expenses are covered by Medicaid). This version of the model is constructed to simulate retirement income adequacy, as noted above. Alternative versions of the model allow similar analysis for replacement rates, standard-of-living calculations, and other ad hoc thresholds.

The baseline version of the model used for this analysis assumes all workers retire at age 65; that they immediately begin drawing benefits from Social Security and defined benefit plans (if any); and, to the extent that the sum of their expenses and uninsured medical expenses exceed the projected, after-tax annual income from those sources, immediately begin to withdraw money from their individual accounts (defined contribution and cash balance plans, as well as IRAs). If there is sufficient money to pay expenses without tapping into the tax-qualified individual accounts, those balances are assumed to be invested in a non-tax-advantaged account where the investment income is taxed as ordinary income. Individual accounts are tracked until the point at which they are depleted. At that point, any net housing equity is assumed to be added to retirement savings in the form of a lump-sum distribution (not a reverse annuity mortgage (RAM)). If all the retirement savings are exhausted and the Social Security and defined benefit payments are not sufficient to pay expenses, the individual is designated as having run short of money at that point.

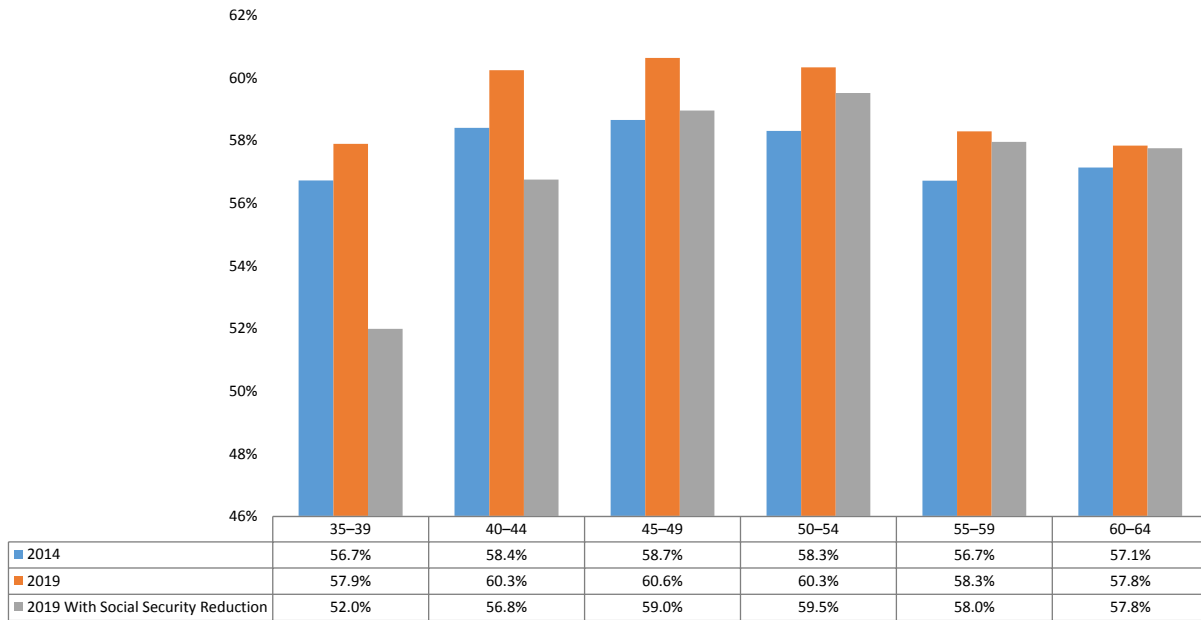
## Retirement Readiness Ratings

The EBRI Retirement Readiness Rating™ (RRR) simulates the percentage of future retirement paths where a household is projected NOT to run short of money in retirement. In other words, this can be thought of as a probability of a successful retirement. Overall, the average RRR for 2014<sup>4</sup> was 57.7 percent. This value increased by 1.7 percentage points to 59.4 percent in 2019. In other words, the new version of the EBRI simulation model estimates that 4.0 percent fewer households will run short of money in retirement than was the case with the 2014 version of the model.<sup>5</sup>

Figure 1 provides the average RRR by age cohort for 2014 as well as the baseline figures for 2019. The average RRR for the youngest cohort (ages 35–39) increased 1.2 percentage points from 56.7 percent to 57.9 percent. The increase in average RRR was 1.8 percentage points for those ages 40–44 and 1.6 percentage points for those ages 55–59. The cohorts with the greatest increase in success were ages 45–49 and 50–54, which both increased by 2.0 percentage points. The cohort with the smallest increase was ages 60–64, which only increased by 0.7 percentage points.

The baseline version of RSPM® assumes that future Social Security retirement benefits under current law will not be modified. However, the current Social Security Trustees Report projects that the funds for Old-Age and Survivors Insurance (OASI) will be exhausted by 2034. While this would not result in Social Security retirement benefits being eliminated, left unaddressed it might well require a reduction in benefits for at least some cohorts of retirees. Figure 1 provides the average 2019 RRR values if Social Security retirement benefits are assumed to have a pro-rata reduction of 23 percent once the OASI Trust Fund reserves become depleted in 2034.<sup>6</sup> Such a reduction would obviously impact the youngest age cohort the most and their average RRR would decrease by 5.9 percentage points, from 57.9 percent to 52.0 percent. Older cohorts would experience less of an impact: those ages 40–44 would have a decrease of 3.5 percentage points from the 2019 baseline values, while those ages 45–49 would have a 1.7 percentage point decrease. The average RRR for households above age 50 would decrease but by less than 1 percentage point.

**Figure 1**  
**Average Retirement Readiness Rating, by Age Cohort: 2014, 2019 Baseline, and 2019 Adjusted for Social Security Reduction**



Sources: EBRI Retirement Security Projection Model® versions 1995, 3458, and 3465.

**Figure 2**  
**Average Retirement Savings Shortfalls,\* by Age Cohort: 2019 vs. 2014 (Adjusted for Inflation)**



Sources: EBRI Retirement Security Projection Model® versions 2163 and 3459.

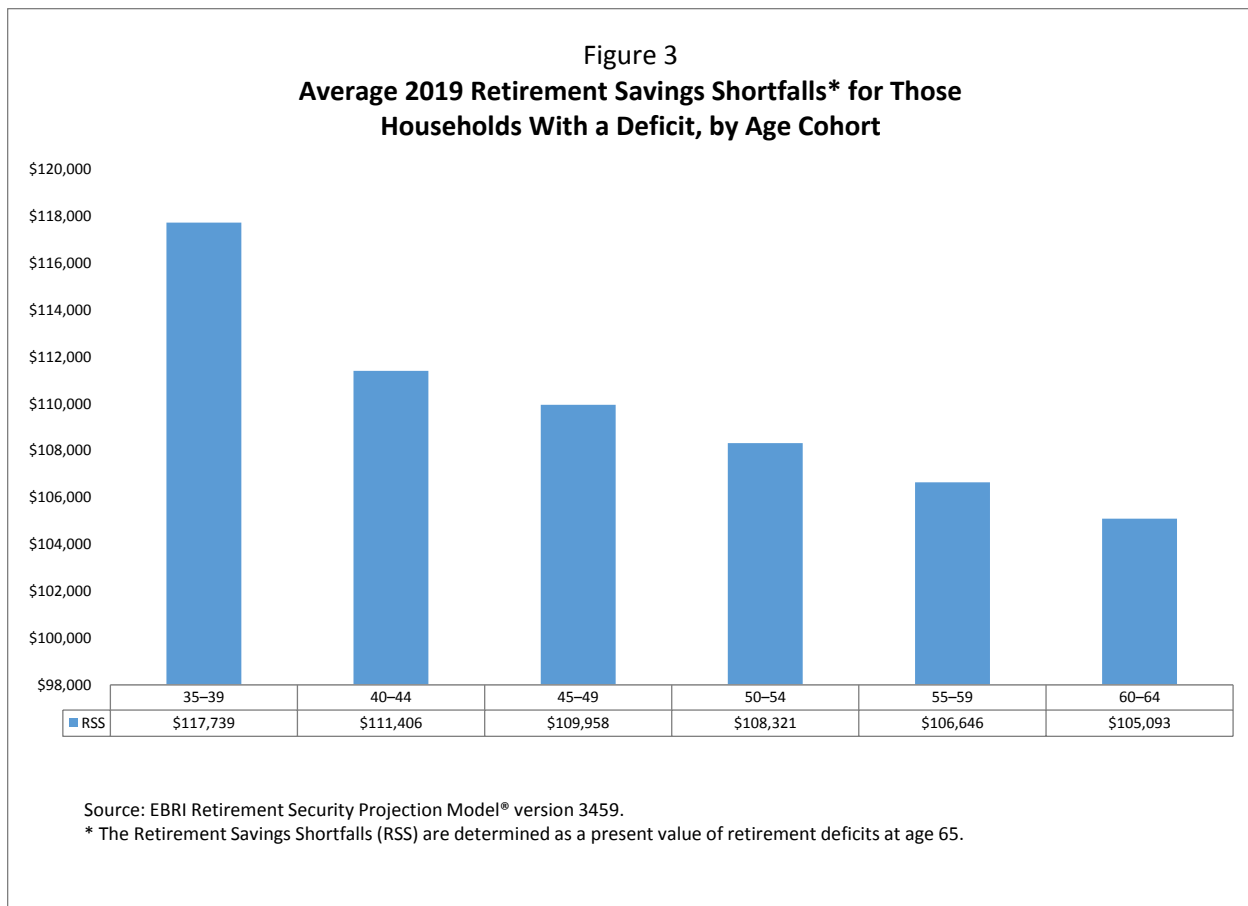
\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

## Retirement Savings Shortfalls

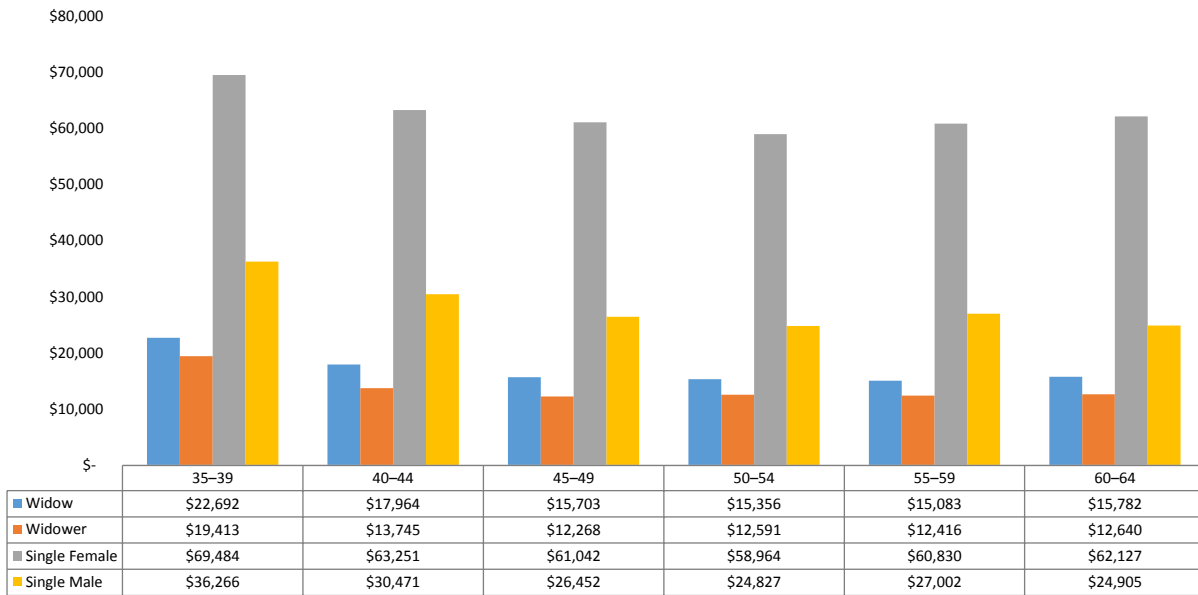
Figure 2 depicts Retirement Savings Shortfalls by age cohort for households between the ages of 35 and 64. The RSS provide information on average individual retirement income deficits. These numbers are present values (in 2019 dollars) at age 65 and represent the additional amount that individuals will have to save by age 65 to eliminate their expected deficits in retirement (which, depending on the simulated life-path, could be a relatively short period or could last decades). Average deficits have decreased in the last five years for all but the oldest age cohort, with the largest (absolute value) decreases being experienced by the youngest cohorts. The additional savings required are \$49,182 for households currently 35–39 — a 22 percent decrease. The deficits decrease with age until they reach a minimum of \$42,681 for households 50–54, which is a 6 percent decrease from 2014. The deficit actually increases for the older cohorts — \$44,186 and \$44,055 for ages 55–59 and 60–65, respectively. For the oldest age cohort, there is also an increase in deficit relative to the 2014 number of 3 percent.

While the deficits in Figure 2 may appear to be relatively small considering they represent the sum of present values that may include decades of deficits, it is important to remember that a significant percentage of the simulated life-paths modeled are considered NOT to run short of money in retirement. In other words, the average deficits represented in Figure 2 are reduced by the inclusion of simulated retirement life-paths that will not run short of money. Looking only at those situations where shortfalls are projected, Figure 3 shows that the values for the conditional deficits range from \$117,739 for households 35–39 to \$105,093 for those ages 60–64.

Figure 4 shows the average deficits by marital status and gender for each of the age cohorts from Figure 2. The additional savings required for those on the verge of retirement (ages 60–64) range from \$12,640 (per individual) for married households where the female dies first (widower) to \$15,782 (per individual) for married households where the husband dies first (widow), increasing to \$24,905 for single males and \$62,127 for single females. Even though the present values are defined in constant dollars, the deficits are largest for the youngest cohort (ages 35–39), largely due to the assumption that health-care-related costs will increase faster than the general inflation rate.



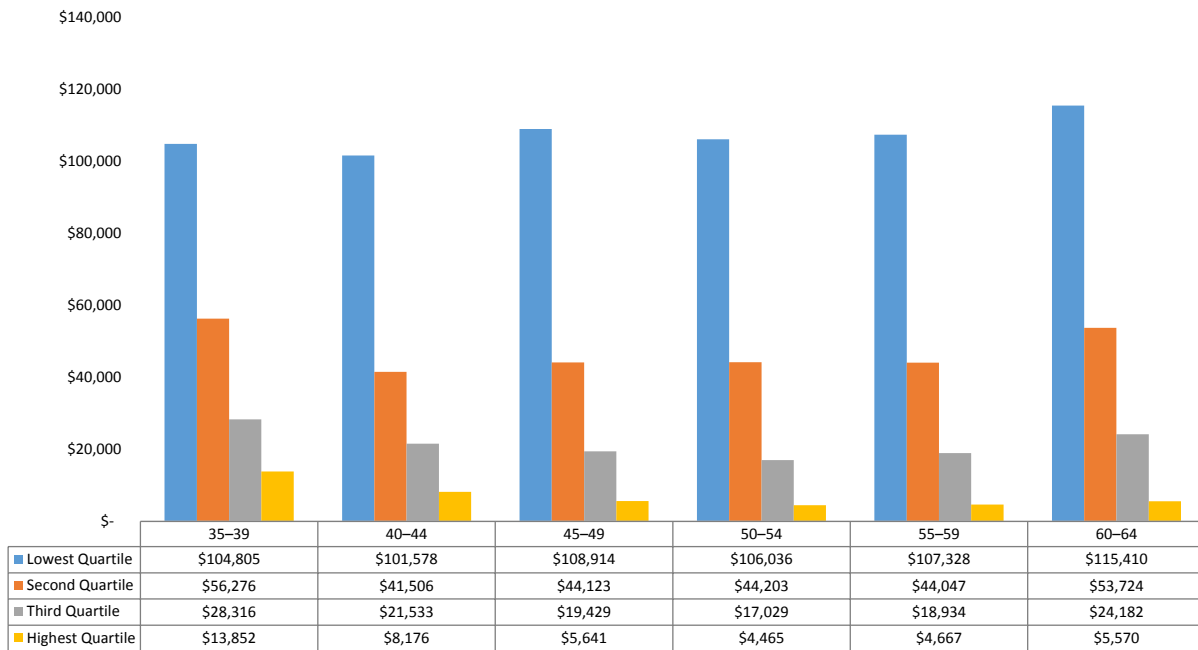
**Figure 4**  
**2019 Retirement Savings Shortfalls,\* by Age Cohort and Marital Status/Gender**



Source: EBRI Retirement Security Projection Model® version 3459.

\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

**Figure 5**  
**2019 Retirement Savings Shortfalls,\* by Age Cohort and Preretirement Income Quartile**



Source: EBRI Retirement Security Projection Model® version 3459.

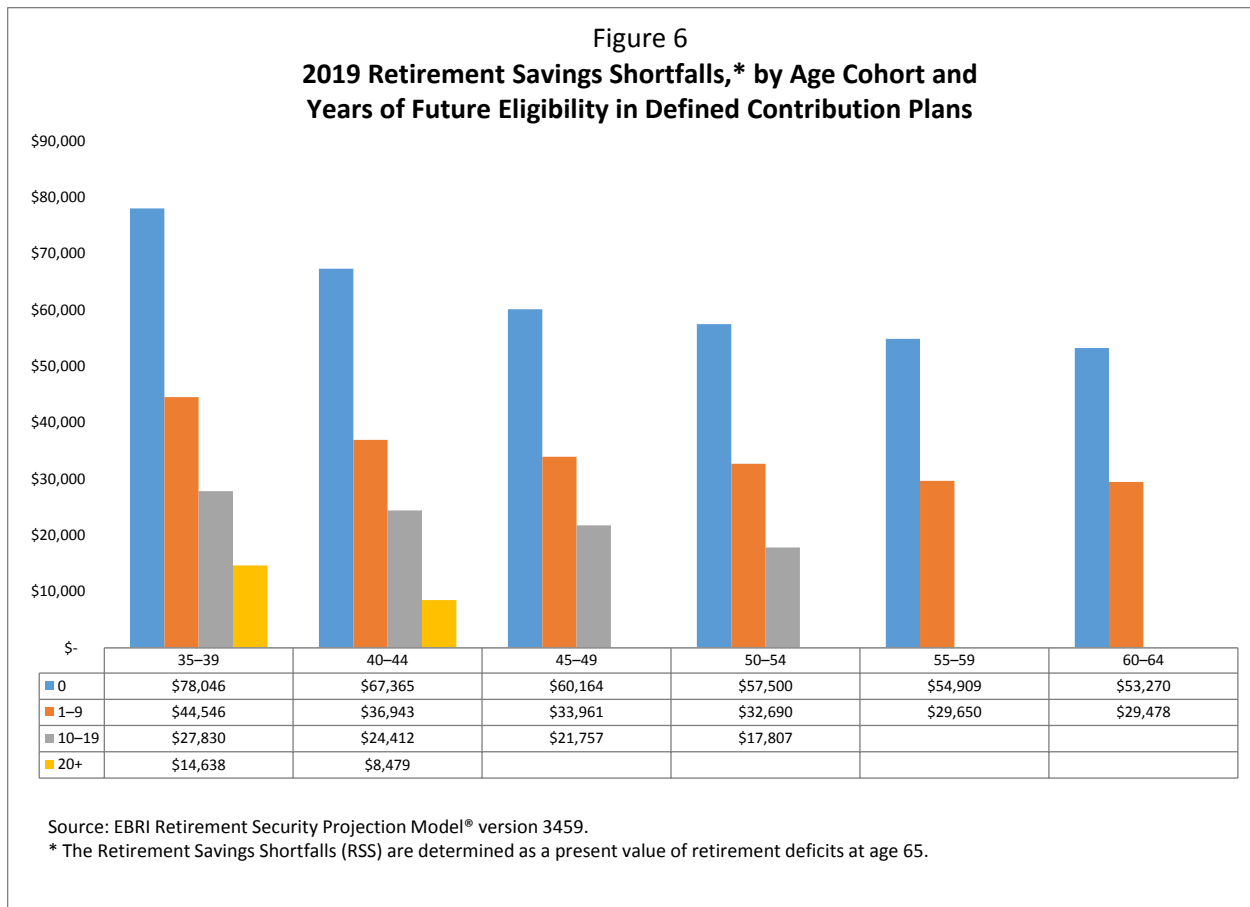
\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.



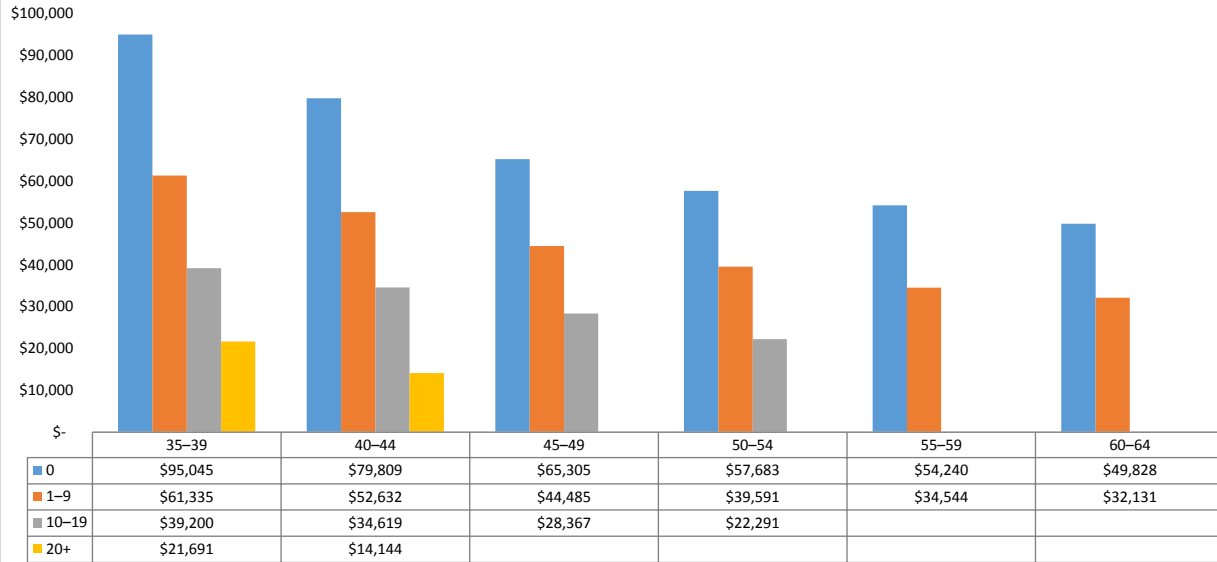
Figure 5 shows the average deficits by preretirement income quartile for each of the age cohorts from Figure 2. The additional savings required for those in the youngest cohort (ages 35–39) range from \$13,852 for households in the highest preretirement income quartile to \$104,805 for those in the lowest quartile.

Eligibility for participation in a defined contribution plan can also have a significant impact on reducing these savings shortfalls. Figure 6 provides information on the average individual retirement income deficits by the number of future years eligible for coverage in a defined contribution retirement plan. The deficit values for those in the youngest cohort (ages 35–39) assumed to have no future years of eligibility (as if they were never simulated to be employed in the future by an organization that provides access to those plans) is \$78,046 per individual. That shortfall decreases substantially to \$44,546 for those with one to nine years of future eligibility and even further to \$27,830 for those with 10–19 years of future eligibility. Households in this age cohort fortunate enough to have at least 20 years of future eligibility in those programs have their average shortfall at retirement reduced to only \$14,638. In other words, workers ages 35–39 with no future eligibility in a DC plan have a deficit more than five times higher than those with at least 20 years of future eligibility.

When the numbers in Figure 6 are compared with the same numbers from the 2014 model adjusted for inflation (Figure 7), it is clear that, for each age cohort, the largest reduction in retirement deficits is experienced by those with the most years of future eligibility for a defined contribution plan. In the case of the youngest age cohort (those ages 35–39), the retirement deficits decrease by 18 percent for those with no future years of eligibility, 27 percent for those with 1–9 years, 29 percent for those with 10–19 years, and 33 percent for those fortunate enough to have at least 20 years of future eligibility.



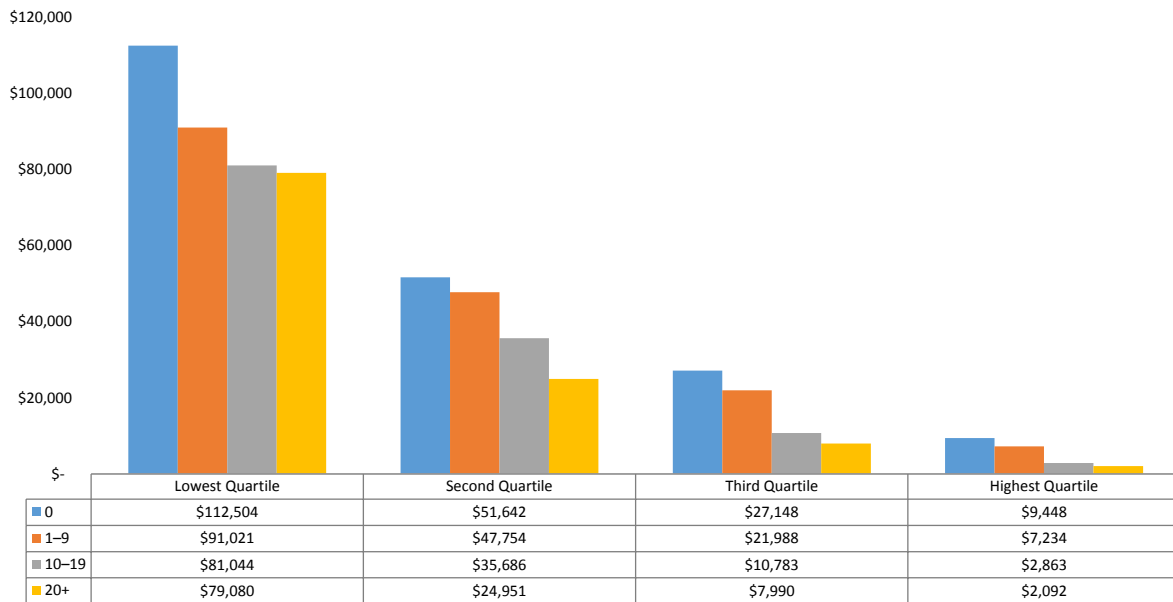
**Figure 7**  
**2014 Retirement Savings Shortfalls\* (Adjusted for Inflation), by Age Cohort and Years of Future Eligibility in Defined Contribution Plans**



Source: EBRI Retirement Security Projection Model® version 2163.

\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

**Figure 8**  
**2019 Retirement Savings Shortfalls,\* by Preretirement Income Quartile and Years of Future Eligibility in Defined Contribution Plans**



Source: EBRI Retirement Security Projection Model® version 3459.

\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

Figure 8 shows the impact of eligibility for participation in a defined contribution plan after controlling for the influence of preretirement income on Retirement Savings Shortfalls. Within even the lowest preretirement income quartile, the average deficit decreases by 30 percent (from \$112,504 to \$79,080) when those with no years of future eligibility in a defined contribution plan are compared with those with 20 or more years. The reduction is even more significant for those in the higher income categories:

- For those in the second preretirement income quartile, the average RSS decreases by 52 percent (from \$51,642 to \$24,951).
- For those in the third preretirement income quartile, the average RSS decreases by 71 percent (from \$27,148 to \$7,990).
- For those in the highest preretirement income quartile, the average RSS decreases by 78 percent (from \$9,448 to \$2,092).

### **The Impact of Longevity on Retirement Savings Shortfalls**

One of the most important variables when it comes to having sufficient retirement savings is longevity. In an attempt to assess the impact of longevity on Retirement Savings Shortfalls, relative longevity quartiles are established based on family status, gender, and age cohort. It should be noted that this analysis would not matter as much if all retirement income was taken in the form of an annuity (either as a real annuity such as Social Security or a nominal annuity such as a private-sector defined benefit plan); however, given that only a very small percentage of defined contribution and IRA balances are currently annuitized (and that an increasing percentage of defined benefit accruals are eligible for a lump-sum distribution), the prospect of “outliving” this portion of their retirement wealth is a very real risk for many future retirees.

Figure 9 depicts Retirement Savings Shortfalls by age cohort and relative longevity quartile. The additional savings required for those on the verge of retirement (ages 60–64) vary from \$10,911 (per individual) for those in the quartile with the least relative longevity to \$79,775 for those in the quartile with the greatest relative longevity. Overall, the deficit for those in the greatest relative longevity quartile averages 10.2 times the deficit for those in the least relative longevity quartile — illustrating how much uncertainty there is around this variable.

### **The Impact of Modifications in Social Security on Retirement Savings Shortfalls**

Figure 10 shows the impact on average RSS values by age of a pro-rata reduction of 23 percent once the OASI Trust Fund reserves become depleted in 2034. Such a reduction would obviously impact the youngest age cohort the most and their average Retirement Savings Shortfall would increase by 17 percent (cf. Figure 10 with Figure 2). Older cohorts will experience less of an impact: those ages 40–44 would have an increase of 10 percent from the 2019 baseline values, while those ages 45–49 would have a 4 percent increase and those ages 50–54 would have a 1 percent increase. The average deficit for households above age 55 would increase but by less than 1 percent.

### **Aggregate Deficits**

As shown in Figure 11, the aggregate deficit number, taking into account current Social Security retirement benefits, is currently estimated to be \$3.83 trillion for all U.S. households where the head of the household is between 35 and 64, inclusive. The similar figure (adjusted for inflation) from 2014 was \$4.44 trillion. When the scenario (described above) in which pro-rata reductions to Social Security retirement benefits are assumed to begin in 2034 is analyzed, the aggregate deficit increases by 6 percent to \$4.06 trillion.

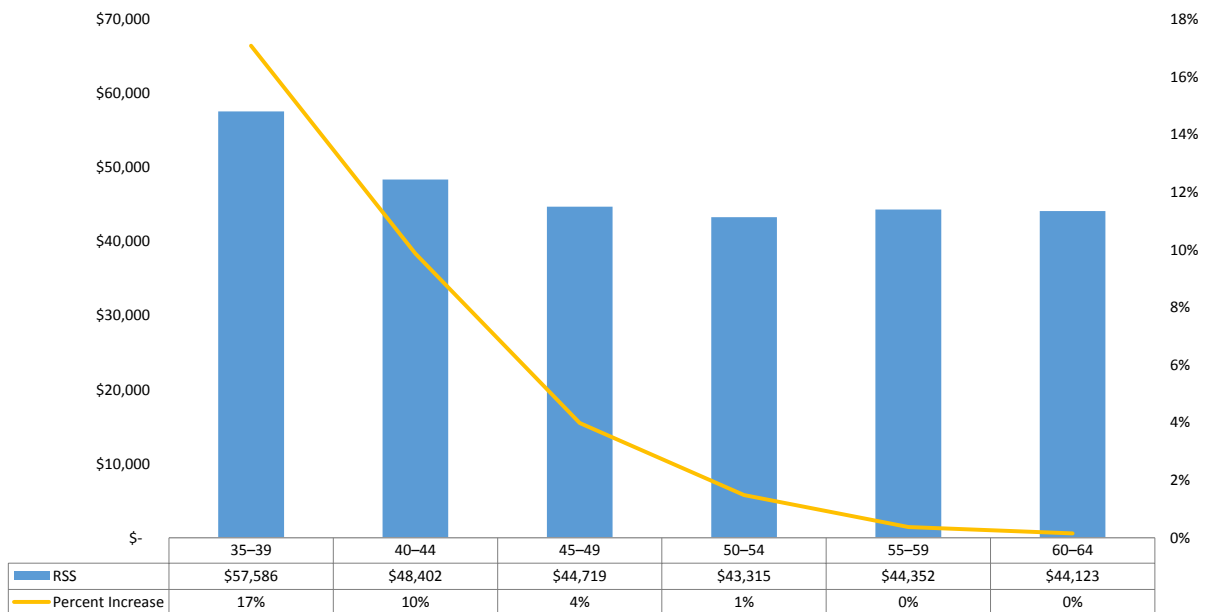
**Figure 9**  
**2019 Retirement Savings Shortfalls,\* by Age Cohort and Relative Longevity Quartile**



Source: EBRI Retirement Security Projection Model® version 3459.

\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

**Figure 10**  
**2019 Retirement Savings Shortfalls\* and Percent Increase Relative to Baseline, by Age Cohort: Assumes Pro Rata Reduction in Social Security Retirement Benefits (Starting in 2034)**



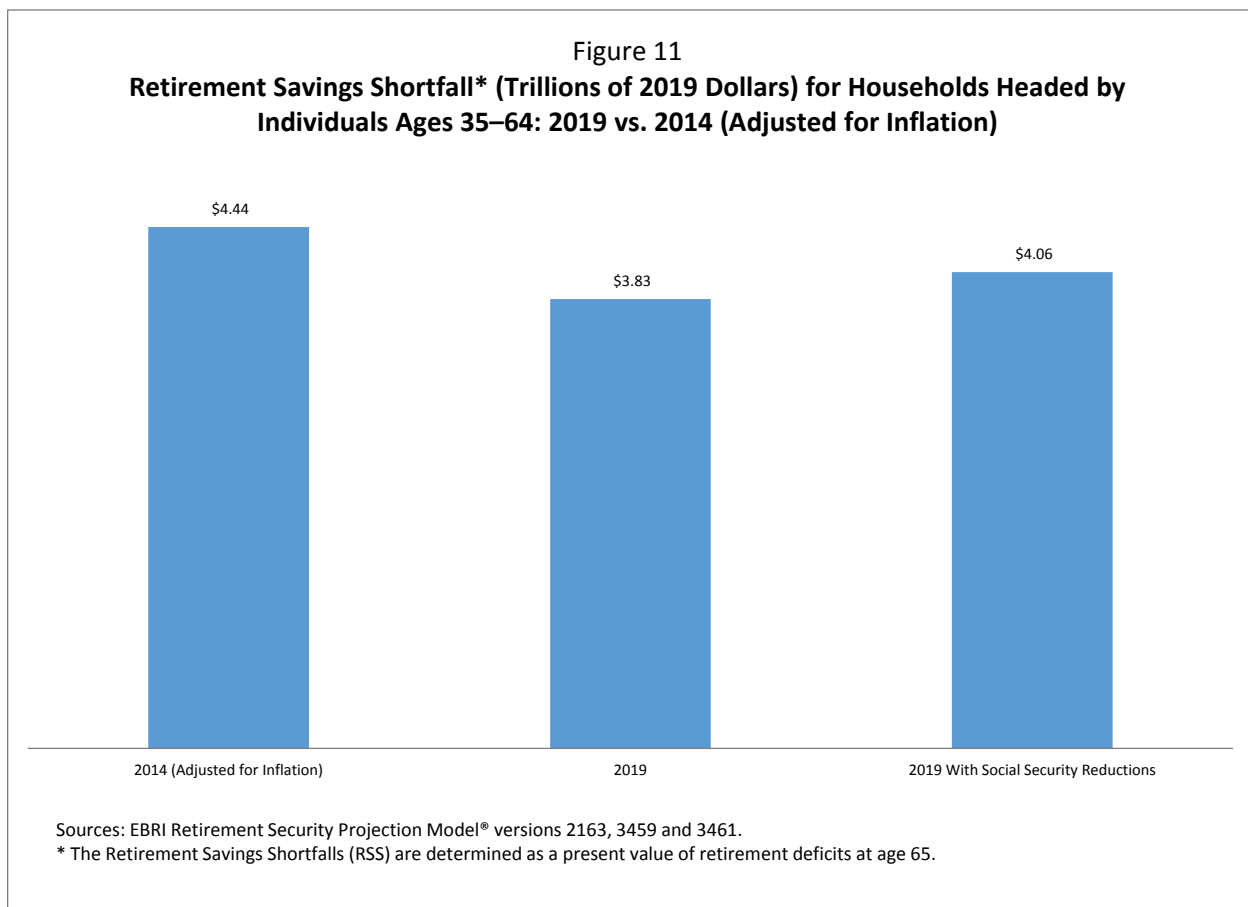
Source: EBRI Retirement Security Projection Model® version 3461.

\* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

## Conclusion

The EBRI Retirement Security Projection Model<sup>®</sup> was developed to provide an assessment of national retirement income prospects. Over the years it has been enhanced to be able to model the impacts of defined benefit plan freezes and automatic enrollment provisions for 401(k) plans, as well as the crises in the financial and housing markets from 2007–2009. The model reflects retirement readiness and average individual retirement deficits, as well as aggregate deficits. It is able to project retirement savings by various age, tenure, gender, and marital status cohorts. And it is flexible enough to examine potential changes to the system, such as a reduction in Social Security retirement benefits and differences in longevity.

As such, the Retirement Security Project Model<sup>®</sup> provides valuable analysis for employers, providers, and policymakers as they seek to understand the drivers of retirement security and the possible outlooks for various cohorts over time.



## References

- VanDerhei, Jack. "Retirement Savings Shortfalls: Evidence from EBRI's Retirement Security Projection Model," *EBRI Issue Brief*, no. 410 (February 2015).
- \_\_\_\_\_. "What Causes EBRI Retirement Readiness Ratings™ to Vary: Results from the 2014 Retirement Security Projection Model,®" *EBRI Issue Brief*, no. 396 (Employee Benefit Research Institute, February 2014).
- \_\_\_\_\_. "A Post-Crisis Assessment of Retirement Income Adequacy for Baby Boomers and Gen Xers." *EBRI Issue Brief*, no. 354 (Employee Benefit Research Institute, February 2011).
- VanDerhei, Jack, and Craig Copeland. "The EBRI Retirement Readiness Rating:™ Retirement Income Preparation and Future Prospects." *EBRI Issue Brief*, no. 344 (Employee Benefit Research Institute, July 2010).

## Endnotes

- 
- <sup>1</sup> A brief chronology of the EBRI Retirement Security Projection Model® (RSPM) is provided in Appendix A of VanDerhei (February 2015). See VanDerhei (February 2011) for additional detail on the impact of the 2007–2009 crises in the financial and real estate markets on retirement income adequacy.
- <sup>2</sup> VanDerhei (February 2014).
- <sup>3</sup> VanDerhei (February 2015).
- <sup>4</sup> See VanDerhei (February 2014) for more detail.
- <sup>5</sup> The 2019 version of the model includes updates of several assumptions including:
- Demographic information.
  - Financial market information.
  - Asset allocation for 401(k) and IRA.
  - Plan type information.
  - Initialization parameters from the 2016 Survey of Consumer Finances.
  - Updated deterministic retiree expenses from 2017 Consumer Expenditures Survey.
  - Medigap and Medicare premia.
- <sup>6</sup> The 2018 Annual Report Of The Board Of Trustees Of The Federal Old-Age And Survivors Insurance And Federal Disability Insurance Trust Funds, page 66.