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EBRI Retirement Security Projection Model®

**ICI Retirement Summit:
A Close Look at Retirement Preparedness in America**

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Background of RSPM

- RSPM grew out of a multi-year project to analyze the future economic well-being of the retired population at the state level
 - Expanded into a national model in 2003
- Given that the initial stakeholders of the model were interested in determining what percentage of future retirement cohorts would run short of money in retirement and when, the development of RSPM did not rely on a replacement rate target as a measure of success for several reasons:
 - Replacement rates don't show when households would run out of money in retirement
 - Very few households annuitize all (or even most) of their individual accounts in retirement
 - a replacement rate focus would overlook the potential longevity risk.
 - It does not typically account for post-retirement investment risk
 - One of the biggest obstacles in terms of maintaining retirement income adequacy for households who might otherwise have sufficient financial resources at retirement age is the risk of long-term care costs for a prolonged period.
 - As with the annuitization experience, in the real world few retirees have long-term care insurance policies that would cover the potentially catastrophic financial impact of this exposure.
 - Consequently, any attempt to incorporate this into a simple replacement rate threshold needs to be carefully assessed against actual implications.

Modeling innovations in RSPM

- Pension plan parameters coded from a time series of several hundred plans
 - Don't rely on self-reported expectations from SCF
- 401(k) asset allocation and contribution behavior based on individual administrative records dating back to 1996
 - Tens of millions of employees in tens of thousands of plans
- Housing equity modeled under three scenarios
- Stochastic modeling of nursing facility care and home based health care

Retirement income

- Limited to income produced by
 - Retirement plans
 - “Traditional” defined benefit
 - Cash balance
 - Defined contribution, especially 401(k)
 - Voluntary enrollment
 - Automatic enrollment (with and without auto escalation)
 - IRAs (including Rollover IRAs)
 - Social Security
 - Housing equity
- Baseline assumes retirement income commences at age 65

Retirement “adequacy”

- Year-by-year comparison of
 - Deterministic and simulated retirement expenditures vs.
 - retirement income (for most defined benefit plans and Social Security) and
 - account balances that may be spent as desired (defined contribution and cash balance plans and IRAs)

Retirement Expense Assumptions

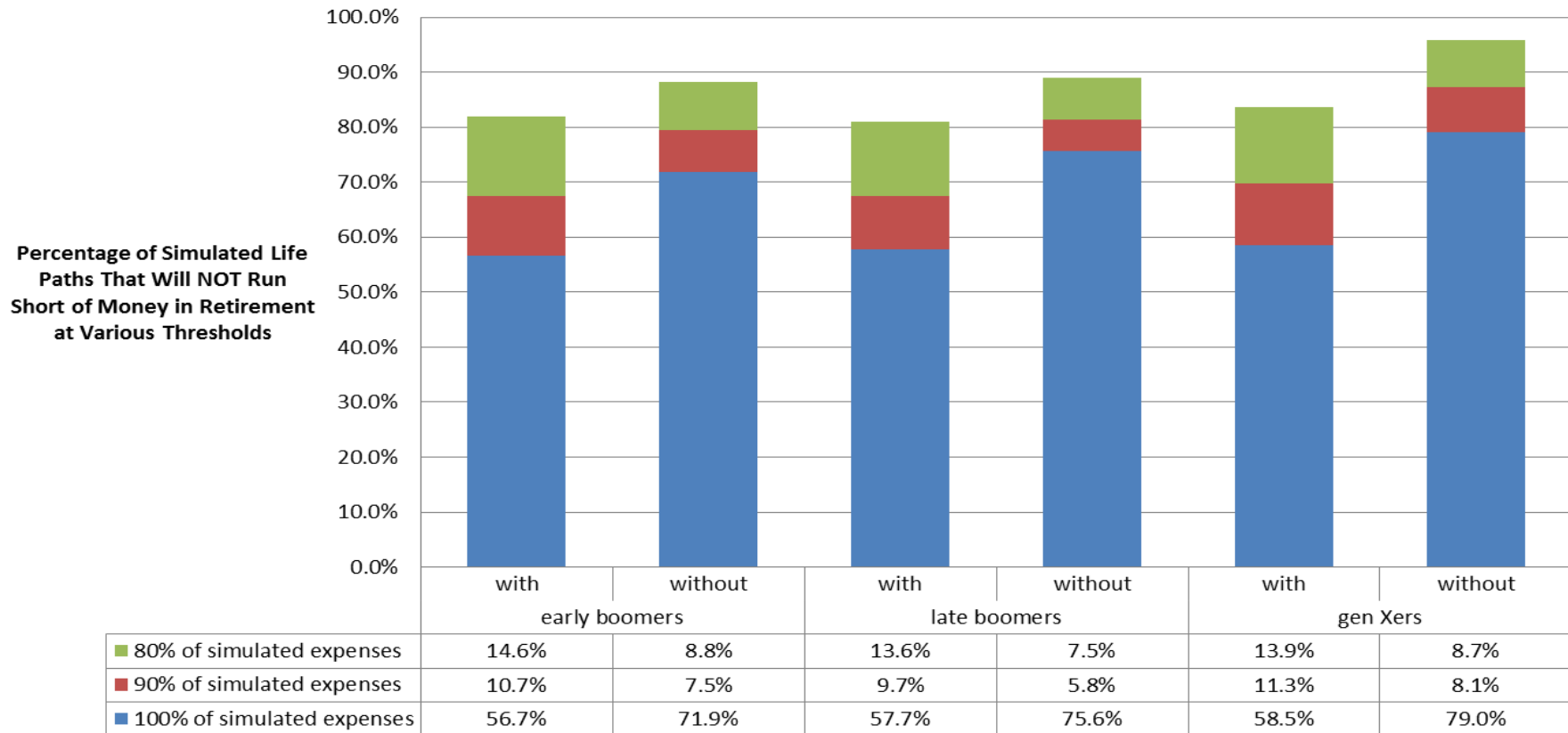
- decomposed total expenditures for retirees into
 - those that are deterministic
 - food, apparel and services, transportation, entertainment, reading and education, housing, and basic health expenditures (including health insurance premia for Medicare and Medigap)
 - those that are stochastic
 - home health care and nursing home care
- performed annual simulations on U.S. families with a retiree to determine if each retiree would:
 - require home health care,
 - enter a nursing home,
 - die, or
 - continue to survive without incurring any of these stochastic health costs.

Model output: simulated expenditure analysis

- Computed the annual differential, if any, between the total expenses (less those covered by Medicaid) and the retirement income.
- If total net expenses are simulated to exceed the total retirement income for a year
 - the households are assumed to spend down their individual account balances until the point at which they are exhausted
 - Baseline: if positive net housing equity, they then sell the house, take proceeds as lump-sum (not a reverse annuity mortgage) and move to apartment
- The present value of the annual deficits are then accumulated for each observation

Percentage of Boomer and Gen X households with "adequate" retirement income depends on definitions and whether long-term care is ignored

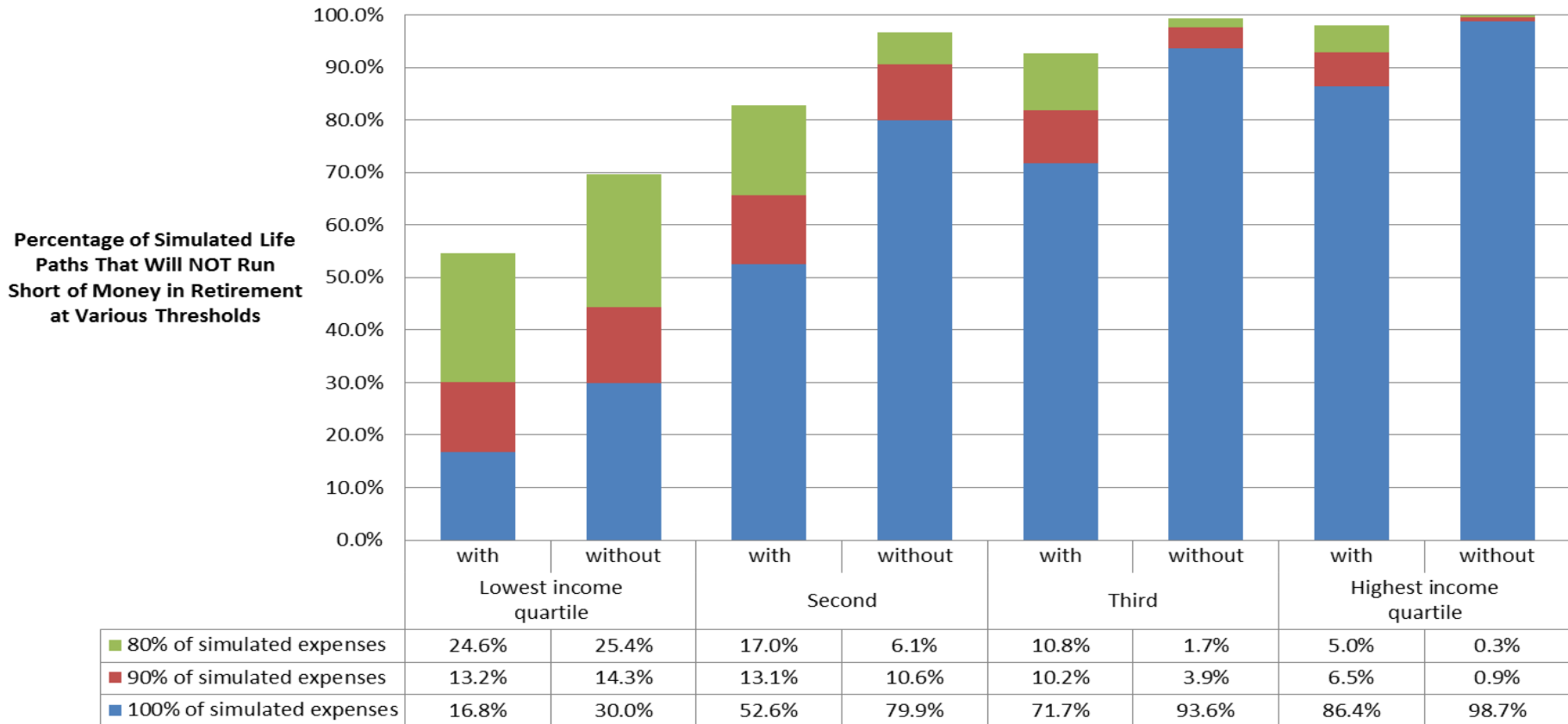
2014 Retirement Readiness Ratings™ With and Without Long Term Care and Home Health Costs , by Age Cohort



Source: EBRI Retirement Security Projection Model® Version 1995.

Percentage of Boomer and Gen X households with "adequate" retirement income depends on pre-retirement income quartile

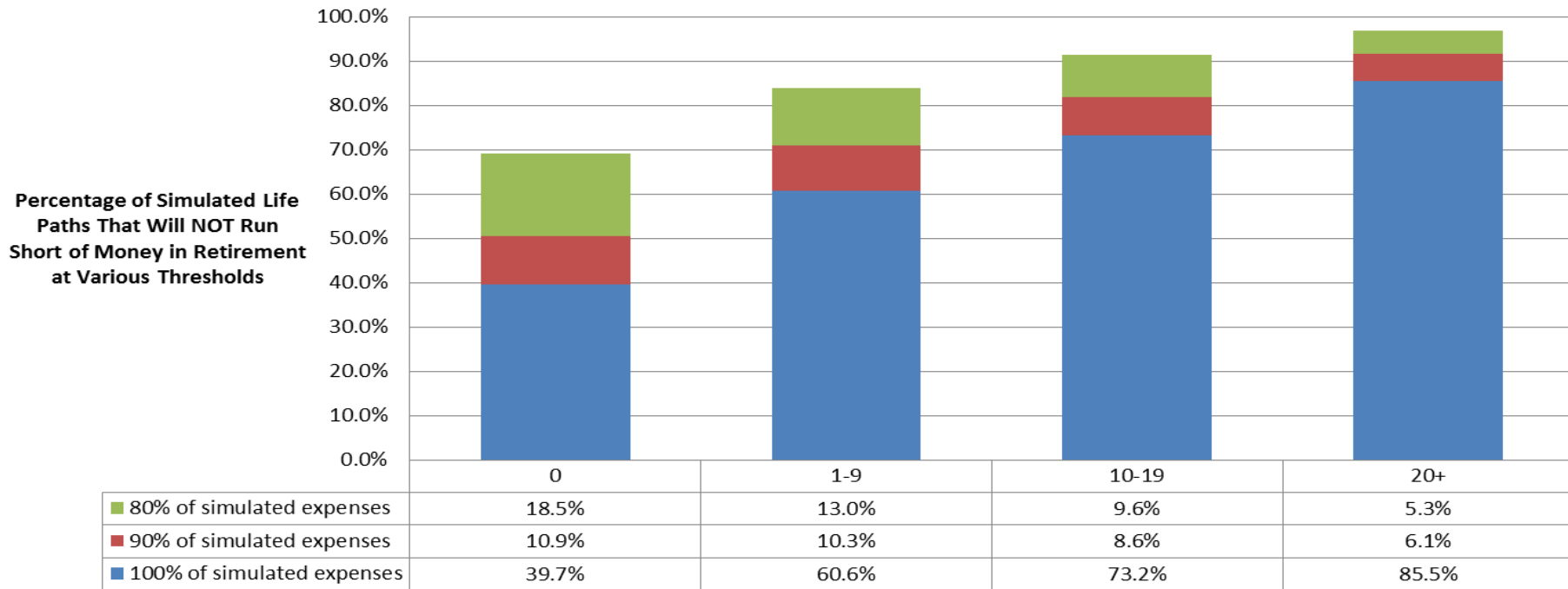
2014 Retirement Readiness Ratings™ With and Without Long Term Care and Home Health Costs , by Pre-Retirement Income Quartile



Source: EBRI Retirement Security Projection Model® Version 1995.

One of the most important factors in determining whether Gen Xers would have sufficient retirement income is future eligibility for participation in a defined contribution plan

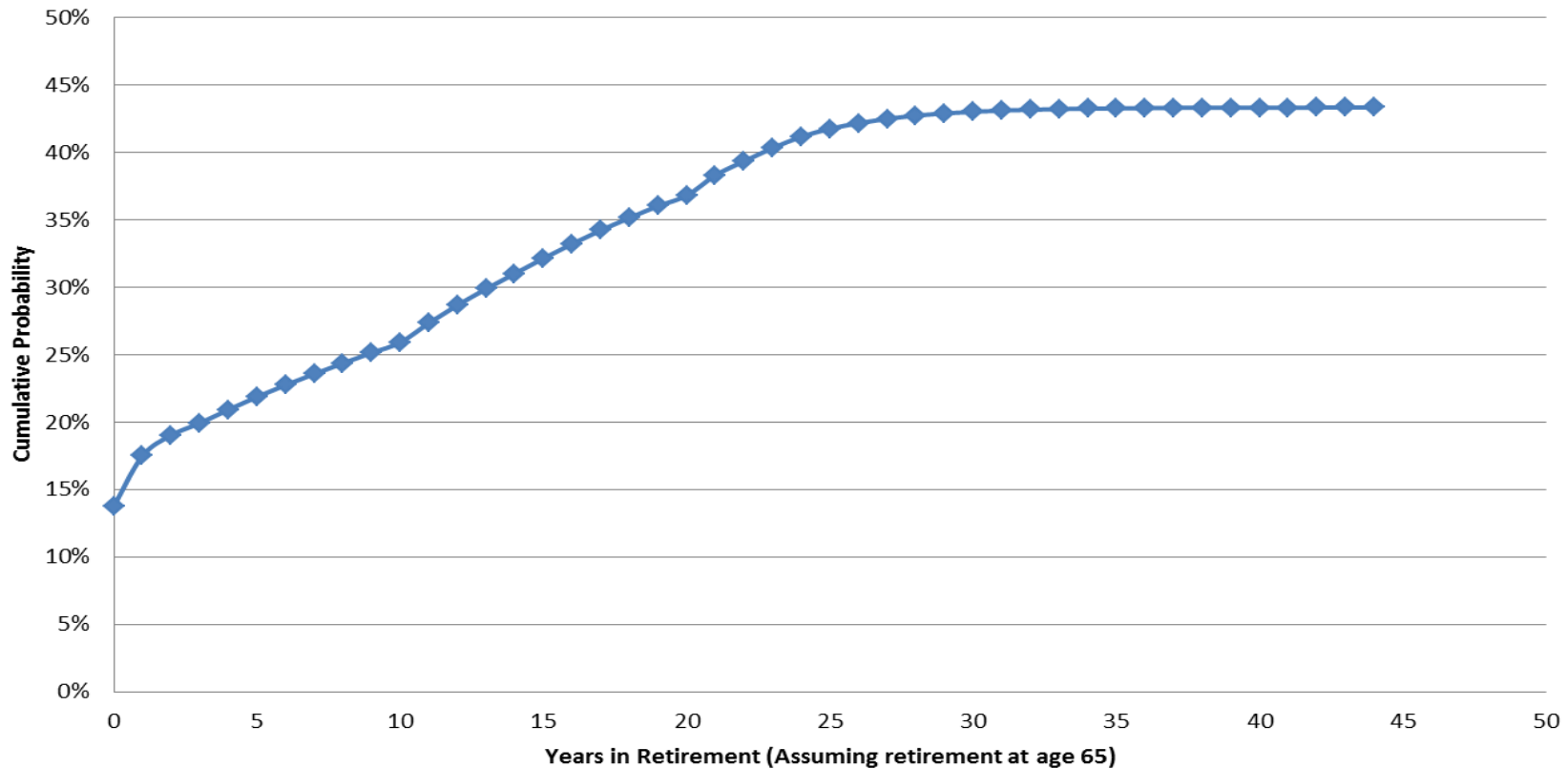
2014 Retirement Readiness Ratings™ With Long Term Care and Home Health Costs for Gen Xers, by Future Years of Eligibility for a Defined Contribution Plan



Source: EBRI Retirement Security Projection Model® Version 1995.

25 percent of Boomers and Gen Xers simulated to run short of money within ten years (assuming 100 percent of simulated expenses) and 37 percent within 20 years

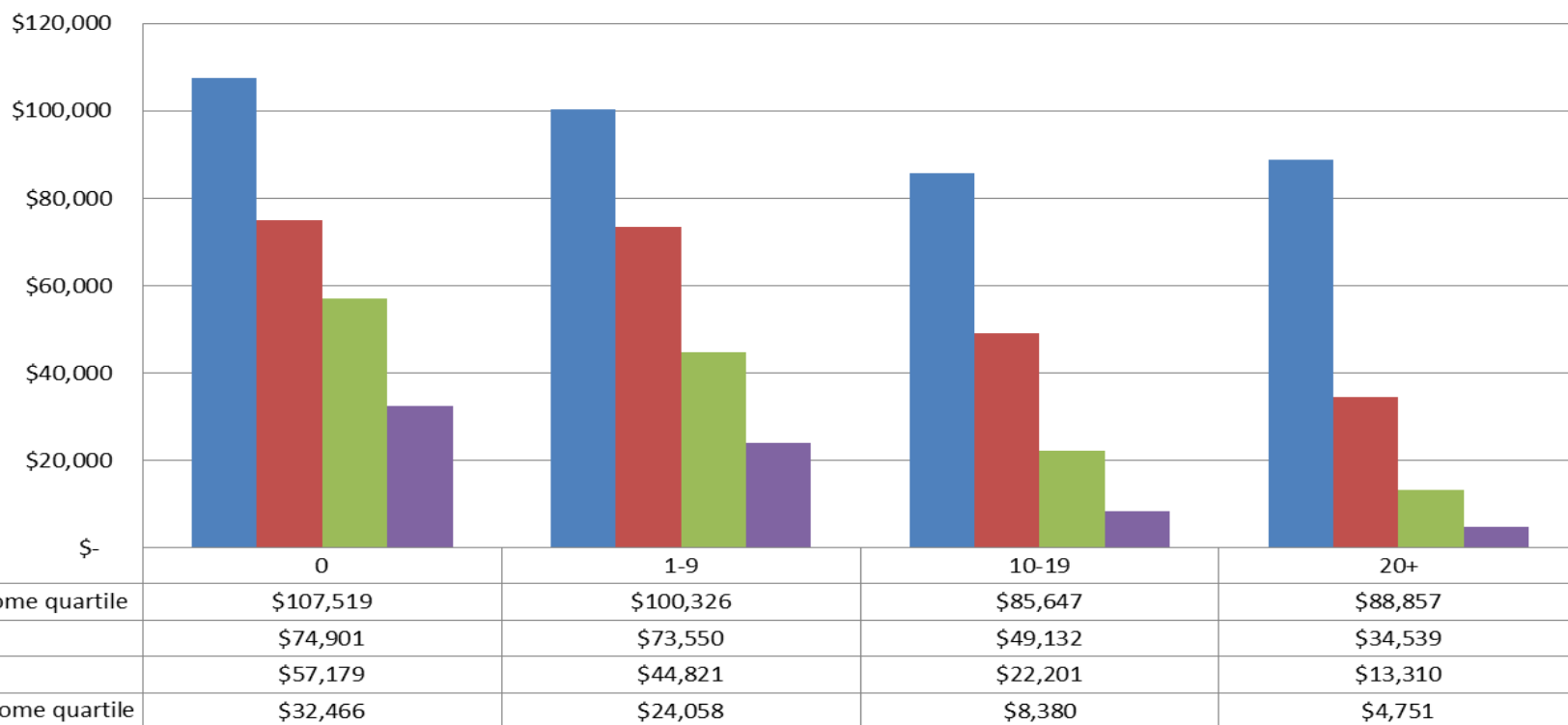
Years in Retirement Before Boomers and GenXers Run Short of Money, Simulations with the 2014 version of the EBRI Retirement Security Projection Model®



Source: EBRI Retirement Security Projection Model® version 2030.

The additional amount needed at age 65 to prevent retirement deficits decreases with higher pre-retirement income and additional future years of eligibility in a defined contribution plan

2014 Unconditional Retirement Savings Shortfalls* for Gen Xers, by Income Quartile and Years of Future Eligibility for Participation in Defined Contribution Plans



Sources: EBRI Retirement Security Projection Model® version 1955.

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

Key takeaways

- Objective of RSPM: simulate who will run short of money in retirement and when
 - Full stochastic accumulation and decumulation model
 - Does not rely on a determination at a point in time (e.g. replacement rate)
- What is the “correct” percentage for Boomer and Gen Xer Households with “adequate” retirement income?
 - Depends on definitions
 - 57-59 percent at 100 percent of simulated expenses
 - 67-70 percent at 90 percent of simulated expenses
 - 81-84 percent at 80 percent of simulated expenses
 - If one chooses to simply ignore long-term care costs, the adequacy ratings are MUCH higher
 - 72-79 percent at 100 percent of simulated expenses
 - 88-96 percent at 80 percent of simulated expenses
- One of the most important factors in determining whether Gen Xers would have sufficient retirement income is future eligibility for participation in a defined contribution plan.
 - The probability of not running short of money in retirement increases from 40 percent for those with no future years of eligibility to 61 percent for those with 1-9 years
 - Increases to 73 percent for those with 10-19 future years of eligibility
 - Increases further to 86 percent for those with 20 or more future years of eligibility

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Appendix

Hybrid conditional participation assumption

- Until empirical information is available to track individual employees from one job to the next and track their 401(k) eligibility status, one needs to rely on some type of assumption with respect to this variable.
- Since there appears to be a well-documented body of evidence that individuals with a propensity to save would seek out 401(k) sponsors (or vice versa), an admittedly ad-hoc approach was developed to compute eligibility probabilities conditional upon the eligibility status on the previous job, as shown below:
 - Let z = unconditional probability of being covered (empirical value as a function of age and wage).
 - Let x = probability of being covered given that your last job was covered. Let y = probability of being covered given that your last job was NOT covered.
 - There are two cases for x in this paper:
 - 1. Complete independence (e.g., $x=z=y$).
 - 2. An ad-hoc assumption that the value of x will be half-way between the unconditional value and 100 percent. In other words, $x = (1+z)/2$ and $y = (z-.5*(z)(1+z))/(1-z)$.
- There is no way to tell at this point which of these assumptions is likely to be more realistic. However, all simulations were conducted using both sets of assumptions to check the sensitivity of the results.