United States Senate Special Committee on Aging

Hearing on:

Bridging the Gap: How Prepared are Americans for Retirement?

Thursday, March 12, 2015 10:30 AM
563 Dirksen Senate Office Building

Statement for the Record

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Bridging the Gap:
How Prepared are Americans for Retirement?

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Introduction

A recent release[1] suggests that the nation's Retirement Income Deficit (RID) has increased 17 percent in the last five years from $6.6 trillion to $7.7 trillion. The RID is defined as "the gap between what American households have actually saved today and what they should have saved today to maintain their living standards in retirement." Although there is no description of the methodology in the release for the March 12th hearing held by the U.S. Senate Special Committee on Aging, the calculation was attributed to the Center for Retirement Research and is said to be based on projections of retirement income and wealth for American workers ages 30-60, using data from the 2013 Survey of Consumer Finances (SCF). Although the SCF is an excellent source of data on Americans' wealth, it provides information only at a single point in time. Therefore, simple projections based on historical trends of point in time data dating back for decades (in some cases prior to the substantial evolution of private retirement plans from defined benefit to defined contribution and certainly prior to recent changes in many 401(k) plans from voluntary enrollment to automatic enrollment after enactment of the Pension Protection Act in 2006) need to be carefully integrated with a micro-simulation model to provide assessments of today's retirement scenarios (as opposed to assessments based on historical data that is not representative of current retirement plans and unable to account for the fact that a significant percentage of current workers will not live until retirement age).

In contrast, the Employee Benefit Research Institute (EBRI) launched a major project to provide this type of assessment in the late 1990s on behalf of several states concerned as to whether their residents would have sufficient income, or when they might become financially indigent, once they reached retirement age. After conducting studies for Oregon, Kansas, and Massachusetts, EBRI developed a national model in 2003—EBRI's Retirement Security Projection Model® (RSPM). EBRI's RSPM was updated in 2010 to incorporate the impact of simulating several significant environmental changes, including defined benefit (DB) plan freezes, automatic enrollment provisions for 401(k) plans, and the crises in the financial and housing markets.[2] EBRI has updated RSPM on an annual basis since then to incorporate changes in financial and real estate market conditions, as well as underlying demographic changes and changes in 401(k) participant behavior.

Throughout, EBRI has evaluated the retirement income adequacy for various demographic cohorts, notably the age cohorts of Early Boomers,[3] Late Boomers,[4] and Gen Xers,[5] the latter being the first generational cohort to have a full working career in a defined-contribution-centric retirement plan environment. One of the major findings in each of the annual studies since 2010 was that the overall retirement income adequacy prospects for Gen Xers were approximately the same as Early Boomers and Late Boomers.[6]

The aggregate deficit number computed by the EBRI RSPM model, taking into account current Social Security retirement benefits and the assumption that net housing equity is utilized "as needed," is currently estimated to be $4.13 trillion for all U.S. households where the head of the household is between 25 and 64, inclusive.[7] Under the scenario (described later in this testimony) in which pro rata reductions to Social Security retirement benefits are assumed to begin in 2033, the aggregate deficit increases by 6 percent to $4.38 trillion.[8]

The testimony starts with a brief overview of the modeling differences between the EBRI RSPM model and that used by the Center for Retirement Research (CRR). It then presents the average 2014 Retirement Savings Shortfalls (RSS) values broken out by age cohorts, gender and family status, and years of future eligibility for participation in defined contribution (DC) plans. Distributional analysis of the RSS values is then discussed. This is followed by an analysis of the impact of nursing home and home health care costs and longevity on RSS. Conclusions are offered in the final section.

Modeling Differences

There are a number of possible explanations for the huge differences between EBRI's deficit estimates and the one produced by CRR:[9]

1. How the models account for expected retirement benefits from participation in a DB plan.
2. How (or if) the models account for the recent changes in many defined contribution (DC) plans to incorporate automatic enrollment features (including automatic escalation of contributions).
3. How the models project future employee and employer contributions to DC plans.

In view of the complexities—and uncertainty—associated with estimating future DB pension streams and the positive impact these can have on retirement income adequacy, the treatment of DB accruals is particularly problematic if the model simply assumes that a survey respondent has an informed estimate of his or her future benefit.

The National Retirement Risk Index (NRRI) model from the Center for Retirement Research at Boston College relies on data from the Survey of Consumer Finances (SCF) in which the survey respondents independently assess what their eventual DB payouts will be. Park (2011) analyzed the SCF respondents' self-reported, expected benefits from defined benefit pension plans and found that the average annual benefit accrual rates in 2004 and 2007 were estimated at 2.06 percent and 2.48 percent of final pay, respectively. These rates were higher than the average annual accrual rate of 1.59 percent reported by the U.S. Department of Labor's 2005 National Compensation Survey (NCS), which is based on official plan documents. This suggests that the 2004 and 2007 SCF respondents overestimated their expected pension benefits at retirement, unless they had more generous accrual formulas than plan participants in the 2005 NCS.

In contrast, RSPM bases the DB accruals on a time series of DB plan-type and generosity parameters coded from, among other things, summary plan description-type information on more than 1,000 large-salaried DB plans per year.

The complexion and composition of retirement plan designs have undergone considerable change over the past 30 years with a well-chronicled decline in the number and generosity provisions of DB pension plans in the private sector and the rapid expansion of DC offerings, notably the 401(k) plan. Moreover, following enactment of the Pension Protection Act of 2006 (PPA), there has been a dramatic increase in the adoption of so-called "automatic" plan designs, notably automatic enrollment, contribution-rate acceleration, and the advent of qualified default investment alternatives (QDIAs), specifically the utilization of target-date funds (TDFs).[10]

In the midst of these dramatic shifts, the treatment of DC-plan design (especially 401(k) plans) varies dramatically among the retirement income adequacy models. For example, the NRRI model projects financial assets in 401(k) plans and other accounts based on wealth-to-income patterns by age group

from the 1983–2013 Federal Reserve Surveys of Consumer Finances (SCF). In essence, the NRRI projections appear to rely on an outdated perspective of 401(k)-plan designs and savings trends.

In contrast, the RSPM has been completely revamped since the original 2003 model to account for the dramatic trends noted above: automatic enrollment (AE) in 401(k) plans, automatic escalation of contributions, and the increased utilization of TDFs, whether through QDIAs or through participant-directed investments.

How much difference might this make? Holden and VanDerhei (2005) demonstrated the large positive impact AE would likely have on employees eligible to participate in 401(k) plans, especially at the lower-income quartiles. VanDerhei (September 2007) used the PPA auto-enrollment safe harbors to show how much larger balances in AE 401(k) plans would likely be for eligible employees as a result of automatic escalation of employee contributions. VanDerhei and Copeland (2008) used a version of the RSPM to model the impact of automatic enrollment and automatic escalation of employee contributions for all workers (whether or not they were currently 401(k) participants or eligible nonparticipants).

The projection of future worker and employer contributions to DC plans is particularly important, especially among younger workers who have longer participation windows, and for whom (particularly in their initial savings years) these contributions constitute a significant percentage of their account growth.

However, most publicly available data sets have only limited information on current employee contributions to DC plans, and employer contribution information (if available at all) typically is not divided into matching vs. nonelective contributions. Moreover, the matching formulas that provide incentives for employees to contribute to at least a particular point are not generally available.[11] Unfortunately, this combination of circumstances typically leaves those constructing retirement income adequacy models with a limited number of options.

CRR's NRRI relies on wealth-to-income patterns dating back to 1983 (a time period in which DC plans have evolved from a secondary savings plan to the primary retirement plan in many cases, and 401(k) plans have changed for many eligible participants from voluntary enrollment to automatic enrollment). While this approach indirectly takes into account the future contribution activity on a macro level, it does not attempt to perform the type of micro simulations reflecting eligibility, participation, contribution activity, asset allocation, and cashout behavior at job change like RSPM does.

In contrast, EBRI's RSPM is able to draw from parameters estimated from administrative data collected from a wide range of record keepers (in some cases all the way back to 1996). The model currently has detailed contribution information on 26.4 million individual participants from more than 72,000 plans.[12]

Another difference between the two models focusses on the post-retirement risks of investment, longevity and long-term care costs.[13] One of the inherent problems arising from not explicitly modelling these post-retirement risks is that the alternative objective is often just to meet some type of a "replacement rate" whereby the employee's projected ratio of post-retirement income to pre-retirement income is compared to some specified threshold. Unfortunately, this procedure (used by NRRI) introduces a number of problems:

- What is the proper measure of the numerator? For example, how should one convert 401(k) and IRA account balances to retirement income?

- What is the proper measure of the denominator? Should this only focus on the last few years of income, should it be a career-average or should it be similar to the AIME calculation used for computing Social Security benefits?
- What is the proper measure of the threshold? Often times these thresholds are computed to adjust for differentials in taxes pre and post retirement as well as age and work-related expenses. However, it is extremely difficult, if not impossible, to have any meaningful modifications for risk aversion.

Since very few households annuitize all (or even most) of their individual accounts in retirement, a replacement rate focus would overlook the potential longevity risk.[14] Also, 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.[15] 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 replacement rate threshold needs to be carefully assessed against actual implications.

The EBRI Retirement Security Projection Model® (detailed in the next section) uses a full stochastic simulation procedure for both the pre-retirement and post-retirement periods to determine the percentage of times households are simulated to NOT run short of money in retirement (i.e., a "successful" retirement) as well as the total value of the deficits simulated to be produced during the retirement period for a household (defined as the present value in 2015 dollars at age 65).

EBRI Retirement Security Projection Model®

One of the basic objectives of RSPM 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 age 65 or older throughout retirement in specific income and age groupings. RSPM® 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, 75, 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 if 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.

The EBRI Retirement Readiness Ratings™ by age cohort for 2014 show a slight improvement from 2013.[16] The primary differences between the values this year and those from 2013 reflect the changes in the market value of defined contribution and IRA assets, as well as the increase in housing values during that period. The RRRs increase by 1.6 percentage points (from 55.1 percent to 56.7 percent) for the Early Boomers, 1.0 percentage points (from 57.5 percent to 58.5 percent) for Late Boomers, and by 0.5 percentage points (from 57.2 percent to 57.7 percent) for Generation Xers.[17] Given that the primary change in RRRs from 2013 to 2014 is the above-average return in the equity markets,[18] it is not surprising that the older age cohorts with larger defined contribution and IRA account balances show larger improvements.

Retirement Savings Shortfalls[19]

While knowing the percentage of households that will be at risk for inadequate retirement income is important for public policy analysis, perhaps equally important is knowing just how large the accumulated deficits are likely to be.

Figure 1 depicts Retirement Savings Shortfalls by age cohort, as well as marital status and gender, for both Baby Boomers and Gen Xers. The RSS provide information on average individual retirement income deficits. These numbers are present values (in 2014 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 lifepath, could be a relatively short period or could last decades). The additional savings required for those on the verge of retirement (Early Boomers) vary from $19,304 (per individual) for married households, increasing to $33,778 for single males and $62,734 for single females. Even though the present values are defined in constant dollars, the RSS values are largest for Gen Xers, largely due to the assumption that health care-related costs will increase faster than the general inflation rate.

While the RSS values in Figure 1 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 less than half of the simulated lifepaths modeled are considered to be "at risk." In other words, the average RSS values represented in Figure 1 are reduced by the inclusion of simulated retirement lifepaths that will not run short of money. Looking only at those situations where shortfalls are projected, Figure 2 shows that the

values for Early Boomers vary from $71,299 (per individual) for married households, increasing to $93,576 for single males and $104,821 for single females. Similar to Figure 1, the conditional RSS values are larger for younger cohorts.

Eligibility for participation in a defined contribution plan can have a significant impact on reducing these savings shortfalls. Figure 3 provides information on the average individual retirement income deficits by the number of future years eligible for coverage in a defined contribution retirement plan for Gen Xers. The deficit values for those 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 $78,297 per individual. That shortfall decreases substantially for those with one–nine years of future eligibility, to $52,113 and even further to $32,937 for those with 10–19 years of future eligibility. Gen Xers fortunate enough to have at least 20 years of future eligibility in those programs have their average shortfall at retirement reduced to only $16,782.

Distribution of Retirement Savings Shortfalls for Gen Xers

Figure 4 provides a more detailed way of looking at the earlier results by showing the distribution of RSS (per individual) for Gen Xers by gender and family status. For example, 68.5 percent of simulated retirement paths for single male Gen Xers do not generate deficits. However, of the 31.5 percent of simulated retirement paths for single male Gen Xers that generate deficits, approximately 1 in 3 generate RSS of less than $50,000. This represents 10.3 percent of all simulated retirement paths for single male Gen Xers. Another 6.2 percent of this group generates RSS between $50,000–$100,000, while 10.4 percent have RSS between $100,000–$200,000. Only 4.6 percent of all simulated retirement paths for single male Gen Xers produce RSS greater than $200,000.

Comparing the results for Gen Xer single females with single males in Figure 4 shows that females are more likely to experience a retirement deficit (57.4 percent of the simulated lifepaths for single females vs. the 31.5 percent for single males), but the conditional likelihood of having large RSS is essentially the same as for single males. For example, 15 percent of the simulated retirement paths for single males that produce deficits have an RSS value greater than $200,000. The same value for single females is 18 percent.

The distribution of RSS values per individual for married households in Figure 4 appears to be quite different from that of single males and single females, but that is to be expected given the implicit diversification existing in a two-person household. In this case, 73.7 percent of simulated retirement paths for families have no deficits. Focusing on families with RSS values in excess of $200,000, only 3.4 percent of simulated retirement paths with a deficit (or 0.9 percent of all family simulated retirement paths) generate a value this large. However, given that these are per-individual RSS values, a $200,000 family shortfall would involve a sum of at least $400,000 between the two family members.

Figure 5 provides the distribution of RSS for Gen Xers categorized by the number of future years of eligibility for participating in a 401(k) plan. Approximately 40 percent of Gen Xers with no future years of 401(k) eligibility are simulated to have no shortfalls, but 13.2 percent of this group is simulated to have shortfalls of more than $200,000. In contrast, approximately 86 percent of those with 20 or more years of future eligibility are simulated to have no deficits, while only 2.3 percent have shortfalls of $200,000 or more.

The Impact of Nursing Home and Home Health Care Costs on Retirement Savings Shortfalls

EBRI has gone to great lengths to model the major risks to retirement income adequacy since the initial introduction of RSPM® in 2003, including stochastic health care risks such as nursing home and home health care costs. Even though these events will not be experienced by all retired households, or experienced to the same extent, they can have catastrophic financial consequences for the future retirement income adequacy of the household. Many attempts to model retirement income adequacy either ignore this risk or make the assumption that all households purchase long-term care insurance at retirement.

Figure 6 provides the average 2014 RSS (per individual) by gender and family status similar to Figure 1; however, in this case all nursing home and home health costs in retirement are assumed to disappear or at least be borne by another entity. Comparing Figure 6 to Figure 1 provides a vivid illustration of how important the correct assumptions are. For example, with nursing home and home health care expenses modeled, single male Early Boomers are projected to have an average present value of financial shortfall of $33,778 in retirement. On the other hand, if these expenses are ignored, the average drops to only $10,210. Similar results are produced for single female and married Early Boomers. Overall, ignoring nursing home and home health care costs (or assuming another entity pays these costs) decreases the RSS by an average of 74 percent.

Looking only at those situations where shortfalls are projected, Figure 7 shows that when nursing home and home health care expenses are ignored, the values for early Boomers decrease to $34,299 (per individual) from the $71,299 value when they were included for married households. Similar values for early Boomers drop to $46,447 (from $93,576) for single males and $57,639 (from $104,821) for single females.

Figure 8 provides information on the average individual retirement income deficits by the number of future years eligible for coverage in a defined contribution retirement plan for Gen Xers when nursing home and home health care expenses are ignored. The deficit values for those 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 now $21,637 (compared to $78,297 when these expenses are not ignored) per individual. That shortfall decreases substantially for those with one–nine years of future eligibility, to $6,498 (compared to $52,113) and even further to $3,607 (compared to $32,937) for those with 10–19 years of future eligibility. Gen Xers fortunate enough to have at least 20 years of future eligibility in those programs would have their average shortfall at retirement reduced to only $883 (compared to $16,782).

Figure 9 shows the distribution of RSS (per individual) for Gen Xers by gender and family status when nursing home and home health care expenses are ignored. For example, 68.5 percent of simulated retirement paths for single male Gen Xers do not generate deficits when these expenses are included (Figure 4) but this number jumps to 85.8 percent when they are ignored. Comparing the results for Gen Xer single females in Figure 9 with those in Figure 4 shows that females are more likely to experience a retirement deficit when these expenses are included (57.4 percent of the simulated lifepaths for single females vs. the 38.8 percent when they are ignored). The distribution of RSS values per individual for married households in Figure 4 vs. Figure 9 provide similar results: 73.7 percent of simulated retirement paths for families have no deficits when the expenses are included but this number increases to 91.4 percent when the expenses are ignored.

Figure 10 provides the distribution of RSS for Gen Xers categorized by the number of future years of eligibility for participating in a 401(k) plan when nursing home and home health care expenses are ignored. Approximately 62 per-cent of Gen Xers with no future years of 401(k) eligibility are simulated to

have no shortfalls when the expenses are ignored (compared to 39.9 percent when they are included). In contrast, approximately 98 percent of those with 20 or more years of future eligibility are simulated to have no deficits when the expenses are ignored, compared to 85.9 per-cent when they are included.

The Impact of Longevity on Retirement Savings Shortfalls

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 "out-living" this portion of their retirement wealth is a very real risk for many Baby Boomers and Gen Xers.

Figure 11 depicts Retirement Savings Shortfalls by age cohort and relative longevity quartile for both Baby Boomers and Gen Xers. The additional savings required for those on the verge of retirement (early Boomers) vary from $7,188 (per individual) for those in the quartile with the earliest relative longevity to $81,811 for those in the quartile with the latest relative longevity. Overall, the RSS for those in the latest relative longevity quartile average 14.8 times those in the earliest relative longevity quartile.

Looking only at those situations where shortfalls result, Figure 12 shows that the values for Early Boomers vary from $29,800 (per individual) for those in the quartile with the earliest relative longevity to $132,201 for those in the quartile with the latest relative longevity.

Figure 13 depicts Retirement Savings Shortfalls by gender, family status and relative longevity quartile for both Baby Boomers and Gen Xers. The additional savings required for single males vary from $4,402 for those in the quartile with the earliest relative longevity to $86,055 for those in the quartile with the latest relative longevity.

Looking only at those situations where shortfalls are projected, Figure 14 shows that the values for single males vary from $32,198 for those in the quartile with the earliest relative longevity to $153,300 for those in the quartile with the latest relative longevity.

The Impact of Modifications in Social Security on Retirement Savings Shortfalls

The baseline RSPM® runs assume 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, Survivors and Disability Insurance (OASDI) will be exhausted by 2033.[20] 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 8 in VanDerhei (February 2014) shows the pro rata reductions applied to Social Security retirement benefits for the sensitivity analysis in which no future funding enhancements are incorporated and aggregate shortfalls are converted into a pro rata reduction for all retirees on an annual basis. This would result in a reduction of 21.9 percent in 2033 and would eventually reach a level of 27.0 percent in 2090.[21]

Figure 15 depicts Retirement Savings Shortfalls by age cohort, as well as marital status and gender, for both Baby Boomers and Gen Xers assuming pro rata reductions in Social Security retirement benefits starting in 2033. The additional savings required for Gen Xers (the cohort most impacted by the proposed change) vary from $27,025 (per individual) for married households (compared to $21,379

without the proposed reduction in Social Security benefits), increasing to $42,775 for single males (compared to $38,065) and $79,341 for single females (compared to $74,256). This pro rata decrease starting in 2033 would increase RSS by an average of 15 percent for Gen Xers.

Figure 16 further demonstrates the importance of Social Security benefits by simulating the counterfactual situation where Social Security benefits would be completely eliminated in 2015. The additional savings required for Gen Xers would vary from $46,276 (per individual) for married households, increasing to $75,216 for single males and $123,525 for single females. Assuming all Social Security retirement benefits were eliminated in 2015, the average RSS (for Boomers and Gen Xers) would increase by 90 percent.

Conclusion

The EBRI Retirement Readiness Rating™ was developed in 2003 to provide an assessment of national retirement income prospects and was updated in 2010 to incorporate several significant enhancements, including the impacts of defined benefit plan freezes, automatic enrollment provisions for 401(k) plans, as well as the crises in the financial and housing markets from 2007–2009. New versions of the model have been generated on an annual 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 24 million 401(k) participants) and IRA account holders (based on a database of 20 million unique individuals).

The Retirement Savings Shortfalls show that for those on the verge of retirement (Early Boomers), the deficits vary from $19,304 (per individual) for married households, increasing to $33,778 for single males and $62,734 for single females. The averages (in 2014 dollars) are slightly larger for Gen Xers: $21,379 (per individual) for married households, increasing to $38,065 for single males and $74,256 for single females

Of course, these values are based on results for all households in a particular cohort, regardless of whether they work for an employer that sponsors a qualified retirement plan or not. The deficit values for Gen Xers 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 $78,297 per individual. That shortfall decreases substantially for those with one–nine years of future eligibility, to $52,113 and even further to $32,937 for those with 10–19 years of future eligibility. Gen Xers fortunate enough to have at least 20 years of future eligibility in those programs could find their average shortfall at retirement reduced to only $16,782.

The results also demonstrate the extreme importance of longevity risk and nursing home and home health care costs in simulating Retirement Savings Shortfalls. Ignoring nursing home and home health care costs (or assuming another entity pays these costs) decreases the RSS by an average of 74 percent whereas the RSS for those in the latest relative longevity quartile average 14.8 times those in the earliest relative longevity quartile.

The impact of Social Security retirement benefits on RSS was demonstrated in two ways. In the first, a pro rata decrease of between 22 and 27 percent starting in 2033 would increase RSS by an average of 15 percent for Gen Xers. Under the counterfactual simulation of assuming all Social Security retirement benefits were eliminated in 2015, the average RSS (for Boomers and Gen Xers) would increase by 90 percent.

Appendix: Brief Chronology of the EBRI Retirement Security Projection Model®

- EBRI's Retirement Security Projection Model® (RSPM) grew out of a multi-year project to analyze the future economic well-being of the retired population at the state level. The Employee Benefit Research Institute (EBRI) and the Milbank Memorial Fund, working with the office of the governor of Oregon, set out in the late 1990s to see if this situation could be evaluated for the state. The resulting analysis (VanDerhei and Copeland, September 2001) focused primarily on simulated retirement wealth with a comparison to ad hoc thresholds for retirement expenditures.
- The April 2001 *EBRI Issue Brief* (VanDerhei and Copeland, April 2001) highlighted the changes in private pension plan participation for defined benefit (DB) and defined contribution (DC) plans and used the model to quantify how much the importance of individual-account plans was expected to increase because of these changes.
- With the assistance of the Kansas Insurance Department, EBRI was able to create the EBRI Retirement Readiness Rating™ (RRR) based on a full stochastic, decumulation model that took into account the household's longevity risk, post-retirement investment risk, and exposure to long-term nursing-home and home-health-care risks. The first state-level RSPM® results were presented to the Kansas' Long-Term Care Services Task Force July 11, 2002 (VanDerhei and Copeland, July 2002), and the results of the Massachusetts study were presented Dec. 1, 2002 (VanDerhei and Copeland, December 2002).
- RSPM® was expanded to a national model—the first national, micro-simulation, retirement-income-adequacy model, built in part from administrative 401(k) data. The initial results were presented at the EBRI December 2003 Policy Forum (VanDerhei and Copeland, 2003).
- The basic model was subsequently modified for testimony for the Senate Special Committee on Aging to quantify the beneficial impact of a mandatory contribution of 5 percent of compensation. (VanDerhei, January 2004).
- The model was enhanced to allow an analysis of the impact of annuitizing defined contribution and individual retirement account (IRA) balances at retirement age (VanDerhei and Copeland, 2004).
- Additional refinements were introduced to evaluate the impact of purchasing long-term care insurance on retirement income adequacy (VanDerhei, 2005).
- The model was used to evaluate the impact of DB freezes on participants by simulating the minimum employer-contribution rate that would be needed to financially indemnify the employees for the reduction in their expected retirement income under various rate-of-return assumptions (VanDerhei, March 2006).
- Later that year, an updated version of the model was developed to enhance the EBRI interactive Ballpark E$timate® by providing Monte Carlo simulations of the replacement rates needed for specific probabilities of retirement income adequacy under alternative-risk-management treatments (VanDerhei, September 2006).
- RSPM® was significantly enhanced for the May 2008 EBRI Policy Forum by allowing automatic enrollment of 401(k) participants with the potential for automatic escalation of contributions to be included (VanDerhei and Copeland, 2008).
- Additional modifications were added for a Pension Research Council presentation that involved a "winners/losers" analysis of DB freezes and the enhanced employer contributions provided to defined contribution plans at the time the DB plans were frozen (Copeland and VanDerhei, 2010).

- Also in 2009, a new subroutine was added to allow simulations of various styles of target-date funds for a comparison with participant-directed investments (VanDerhei, June 2009).
- In April 2010, the model was completely re-parameterized with 401(k)-plan design parameters for sponsors that had adopted automatic-enrollment provisions (VanDerhei, April 2010).
- A completely updated version of the national model was produced for the May 2010 EBRI Policy Forum and used in the July 2010 *EBRI Issue Brief* (VanDerhei and Copeland, 2010).
- The new model was used to analyze how eligibility for participation in a defined contribution plan impacts retirement income adequacy in September 2010 (VanDerhei, September 2010), and was later used to compute Retirement Savings Shortfalls for Baby Boomers and Generation Xers in October 2010 (VanDerhei, October 2010a).
- In October testimony before the Senate Health, Education, Labor and Pensions Committee on "The Wobbly Stool: Retirement (In)security in America," the model was used to analyze the relative importance of employer-provided retirement benefits and Social Security (VanDerhei, October 2010b).
- The November 2010 *EBRI Issue Brief* expanded upon earlier work by EBRI to provide the first results of a new simulation model that estimated the impact of changing 401(k) plan design variables and assumptions on retirement income adequacy. Until recently however, there was extremely limited evidence on the impact of automatic contribution escalation (VanDerhei and Lucas, 2010).
- In February 2011, the model was used to analyze the impact of the 2008–2009 crisis in the financial and real estate markets on retirement income adequacy (VanDerhei, February 2011).
- An April 2011 article introduced a new method of analyzing the results from RSPM® (VanDerhei, April 2011). Rather than simply computing an overall percentage of the simulated life-paths in a particular cohort that would not have sufficient retirement income to pay for the simulated expenses, the new method computed the percentage of households that would meet that requirement more than a specified percentage of times in the simulation.
- As explored in the June 2011 *EBRI Issue Brief,* RSPM® allowed retirement income adequacy to be assessed at retirement ages later than 65 (VanDerhei and Copeland, June 2011).
- In a July 2011 *EBRI Notes* article (VanDerhei, July 2011), RSPM® was used to provide preliminary evidence of the impact of the "20/20 caps" on projected retirement accumulations proposed by the National Commission on Fiscal Responsibility and Reform.
- The August 2011 *EBRI Notes* article (VanDerhei, August 2011) used RSPM® to analyze the impact of DB plans in achieving retirement income adequacy for Baby Boomers and Gen Xers.
- In September of that year, it was used to support testimony before the Senate Finance Committee (VanDerhei, September 2011) in analyzing the potential impact of various types of tax-reform options on retirement income. This was expanded in the November 2011 *EBRI Issue Brief* (VanDerhei, November 2011).
- A March 2012 *EBRI Notes* article (VanDerhei, March 2012) used new survey results to update the analysis of the potential impact of various types of tax-reform options on retirement income.
- The May 2012 *EBRI Notes* article (VanDerhei, May 2012) provided 2012 updates for the previously published RRRs as well as RSS.

- The June 2012 *EBRI Notes* article (VanDerhei, June 2012) introduced severity categories in the RSS projections for Gen Xers.
- The August 2012 *EBRI Notes* article (VanDerhei, August 2012) provided additional evidence on whether deferring retirement to age 70 would provide retirement income adequacy for the vast majority of Baby Boomers and Gen Xers.
- The September 2012 *EBRI Notes* article (VanDerhei, September 2012) analyzed the impact of increasing the default-contribution rate for automatic enrollment 401(k) plans with automatic escalation of contributions.
- The November 2012 *EBRI Notes* article (VanDerhei, November 2012) reclassified the RRRs to provide additional information on those substantially above the threshold; close to the threshold; and substantially below the threshold.
- The March 2013 *EBRI Notes* article (VanDerhei and Adams, March 2013) used a modified version of RSPM® to assess the probability that respondent households would not run short of money in retirement if they did, in fact, accumulate the amount they said would be required in the 2013 Retirement Confidence Survey.
- The June 2013 *EBRI Issue Brief* (VanDerhei, June 2013a) used RSPM® to provide a direct comparison of the likely benefits under specific types of DC and DB retirement plans.
- The June 2013 *EBRI Notes* article (VanDerhei, June 2013b) used RSPM® to show that 25–27 percent of Baby Boomers and Gen Xers who would have had adequate retirement income under return assumptions based on historical averages were simulated to end up running short of money in retirement if today's historically low interest rates were assumed to be a permanent condition.
- The August 2013 *EBRI Issue Brief* (VanDerhei, August 2013) used RSPM® to analyze the Obama administration's fiscal year (FY) 2014 budget proposal to include a cap on tax-deferred retirement savings that would limit the amounts accumulated in specified retirement accounts to that necessary to provide the maximum annuity permitted for a tax-qualified DB plan under current law.
- The December 2013 *EBRI Notes* article (VanDerhei, December 2013) used RSPM® to expand the analysis in the June 2013 *Issue Brief.* Rather than trying to reflect the real-world variation in DB accruals, the previous baseline analysis used the median accrual rate in the sample (1.5 percent of final compensation per year of participation) as the stylized value for the baseline counterfactual simulations. The new research computed the actual final-average DB accrual that would be required to provide an equal amount of retirement income at age 65 as would be produced by the annuitized value of the projected sum of the 401(k) and IRA rollover balances.
- The January 2014 *EBRI Notes* article (VanDerhei, January 2014) used RSPM® to model the likelihood that 401(k) participants currently ages 25–29 would have sufficient 401(k) accumulations that, when combined with Social Security benefits, could replace 60, 70 or 80 percent of their preretirement income on an inflation-adjusted basis.
- The February 2014 *EBRI Issue Brief* (VanDerhei, February 2014) focused on how the probability of not running short of money in retirement varies with respect to longevity, investment return, and potential long-term health care costs in retirement (e.g., nursing home costs).
- The June 2014 *EBRI Notes* article (VanDerhei, June 2014a) provided new results showing how many years into retirement Baby Boomer and Gen Xer households were simulated to run short of money, by preretirement income quartile.

- The simulation results for the June 2014 ERISA Advisory Council testimony (VanDerhei, June 2014b) suggested that, assuming no participant behavior change for participation, contribution or asset allocation resulting from reduced access to 401(k) balances, retirement balances from 401(k) plans, and IRA rollovers originating in 401(k) plans may be increased substantially for young employees with 30 or more years of eligibility if cashouts at job turnover, hardship withdrawals (and the accompanying suspension of contributions) and plan loan defaults were substantially reduced or eliminated.

- One of the major findings in each of the last five annual retirement income adequacy studies by EBRI was that the retirement income adequacy prospects for Gen Xers were approximately the same as Baby Boomers. However, recent studies by other organizations suggest Gen Xers will fare much worse than the Boomers. Unfortunately, these studies appear to be plagued by either explicitly ignoring future contributions to defined contribution plans or failing to account for the recent changes in many defined contribution plans to incorporate automatic enrollment features (including automatic escalation of contributions). The August 2014 *EBRI Notes* article (VanDerhei, August 2014) analyzed the likely impact of this error and concluded that ignoring future contributions exaggerates the percentage of Gen-X workers simulated to run short of money in retirement by roughly 10 to 12 percentage points among all but the lowest-income group.

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Endnotes

[1] Pension Rights Center (2015)

[2] A brief chronology of RSPM is provided in Appendix A.

[3] Individuals born between 1948–1954.

[4] Individuals born between 1955–1964.

[5] Individuals born between 1965–1974.

[6] The 2014 version of RSPM produced an EBRI Retirement Readiness Rating™ (RRR) of 56.7 percent for Early Boomers, 58.5 percent for Late Boomers, and 57.7 percent for Gen Xers. See VanDerhei (February 2014) for more detail.

[7] This number is somewhat smaller than the $4.3 trillion reported in VanDerhei (May 2012); however the 2012 number was generated prior to the time the stochastic rate of return assumptions for RSPM were reset in 2013 (see VanDerhei June 2013a for more detail). Both the 2012 and 2014 aggregate deficits are smaller than the $4.6 trillion reported in VanDerhei (October 2010b); however, the baseline assumptions used in the 2010 analysis did not provide for the utilization of net housing equity to ensure retirement income adequacy. When the 2012 analysis is repeated with the same assumptions as used in 2010, the aggregate deficit actually increases to $4.8 trillion.

[8] The EBRI RSPM model can also be used do illustrate how important the current Social Security retirement benefits are to overall retirement income adequacy. In VanDerhei (February 2015) a counterfactual scenario in which Social Security retirement benefits are assumed to be eliminated in 2015 is modeled with the result that the aggregate deficit increases by 88 percent to $7.87 trillion.

[9] For an independent assessment of the two models, see Pang and Schieber (2014)

[10] At year-end 2012, more than 50 percent of large Vanguard plans had an automatic enrollment feature, compared with about 40 percent in 2007 (Utkus and Young, 2014)

[11] For example, one would expect that employees would generally contribute a larger percentage of their compensation if the employer matched 50 percent on the first six percent of compensation as opposed to 100 percent on the first three percent of compensation. For early results of this phenomena, see Yakoboski and VanDerhei (1996).

[12] See VanDerhei, Holden, Alonso, Bass and Pino. (December 2014) for details of the year-end 2013 data.

[13] VanDerhei (September 2006).

[14] See Figures 11 and 12 of VanDerhei (February 2014) for more detail.

[15] VanDerhei (February 2014) and Bajtelsmit, Foster, and Rappaport (2013).

[16] See VanDerhei (February 2014) for details.

[17] In this analysis, Early Boomers are defined as those born between 1948 and 1954; Late Boomers as born between 1955 and 1964; and Gen Xers as born between 1965 and 1974.

[18] Standard & Poor's 500 Index increased 31.3 percent in 2013.

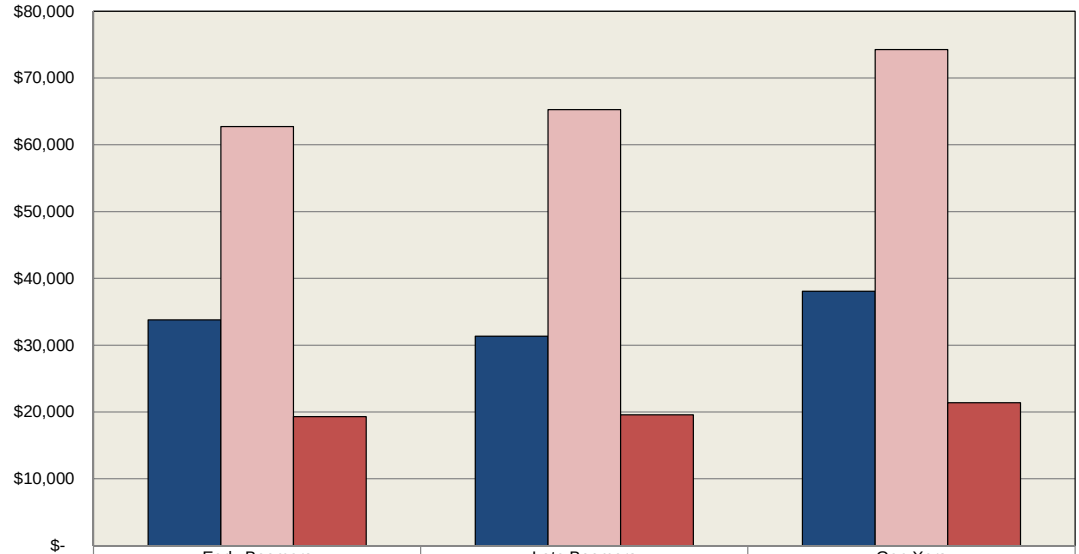
[19] The following material first appeared in VanDerhei (February 2015).

[20] Social Security Administration (2013).

[21] It should be noted that there are alternative modifications possible that would result in the same aggregate financial situation for the Social Security Trust Fund but would have different distributional consequences (e.g., adding a new bend point in the Primary Insurance Amount (PIA) formula that would result in a larger reduction for those with a larger average indexed monthly earnings value).

Figure 1

2014 Retirement Savings Shortfalls,*
by Age Cohort, Marital Status, and Gender

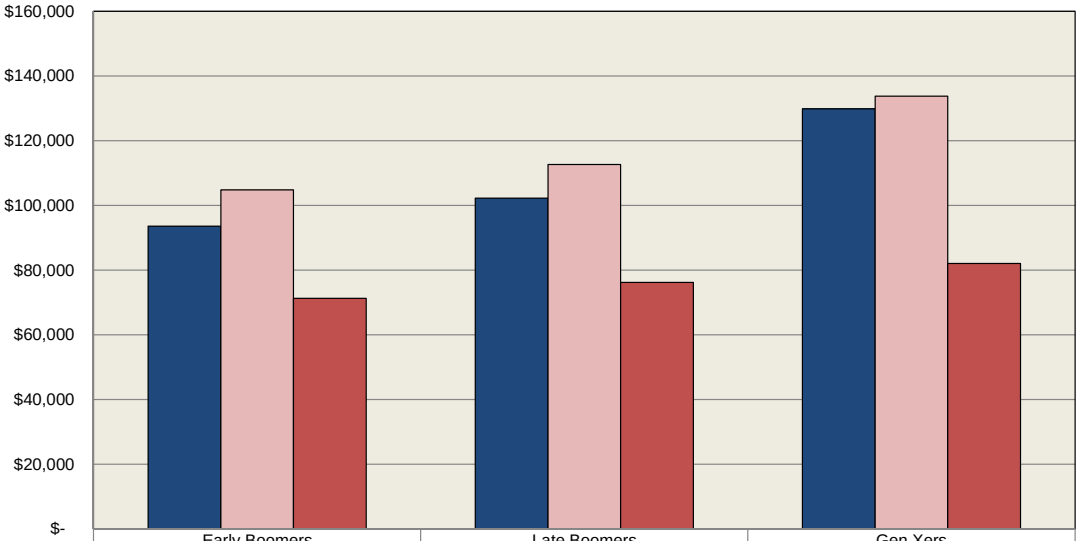


	Early Boomers	Late Boomers	Gen Xers
Single Male	$33,778	$31,342	$38,065
Single Female	$62,734	$65,277	$74,256
Married	$19,304	$19,566	$21,379

Sources: 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 2

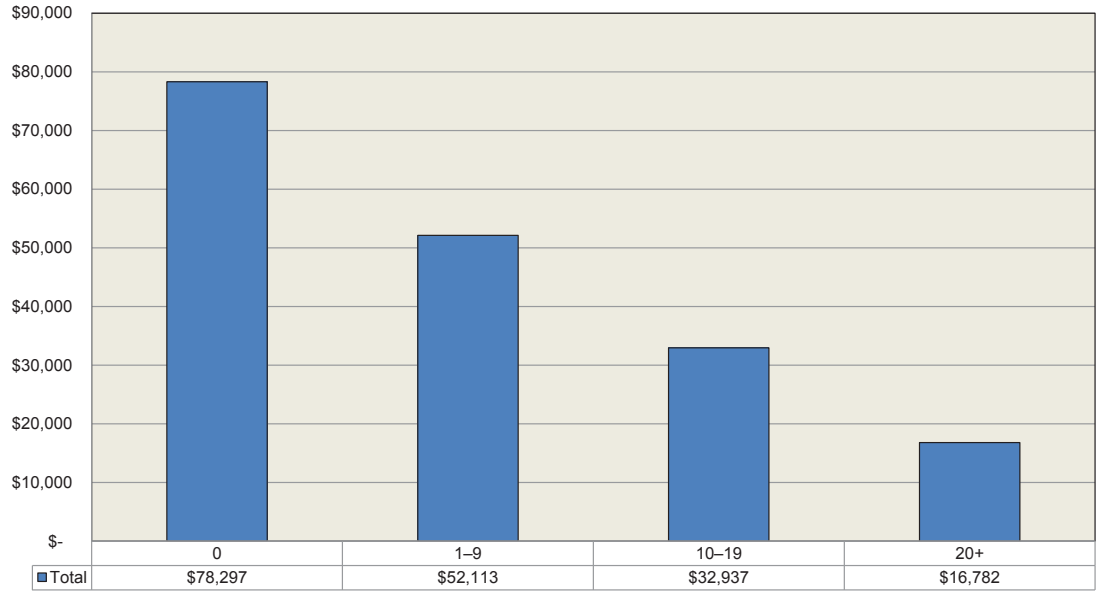
2014 Retirement Savings Shortfalls,* for Those Households
With a Deficit, by Age Cohort, Marital Status, and Gender



	Early Boomers	Late Boomers	Gen Xers
Single Male	$93,576	$102,287	$129,861
Single Female	$104,821	$112,651	$133,790
Family	$71,299	$76,222	$82,083

Sources: EBRI Retirement Security Projection Model® version 2163.
* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

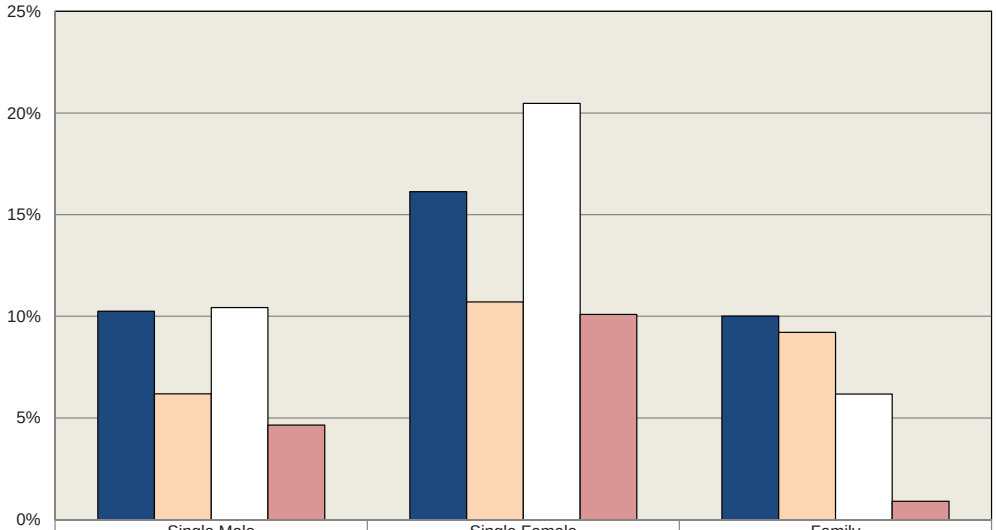
Figure 3
2014 Retirement Savings Shortfalls* for Gen Xers, by Years of Future Eligibility for Participation in Defined Contribution Plans



	0	1–9	10–19	20+
Total	$78,297	$52,113	$32,937	$16,782

Sources: EBRI Retirement Security Projection Model® version 2164.
* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

Figure 4
Distribution of 2014 Retirement Savings Shortfalls (per Individual), by Gender and Marital Status

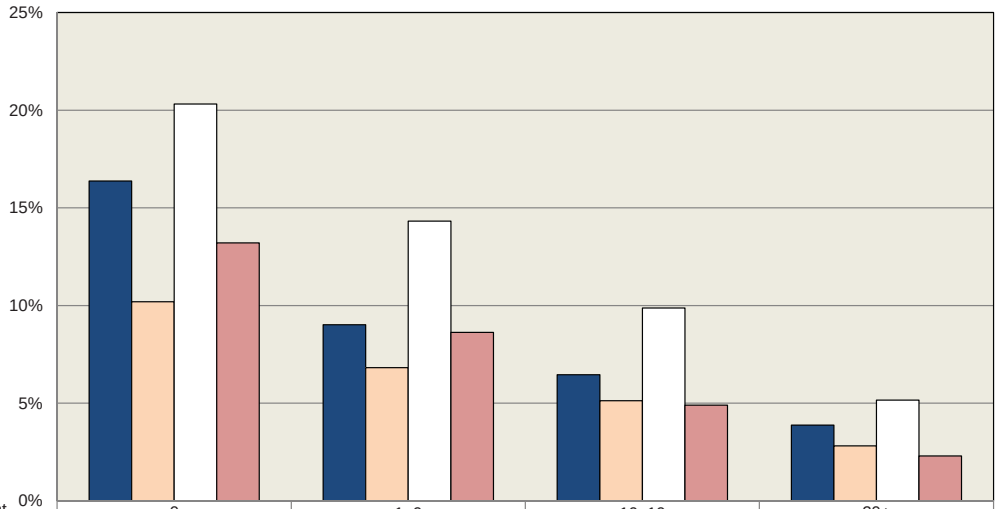


Shortfall Amount	Single Male	Single Female	Family
$1–$50,000	10.3%	16.1%	10.0%
$50,001–$100,000	6.2%	10.7%	9.2%
$101,000–$200,000	10.4%	20.5%	6.2%
More Than $200,000	4.6%	10.1%	0.9%

Source: EBRI Retirement Security Projection Model,® version 2162. Note the percentages in each column do not add to 100 percent because individuals *without* shortfalls are not displayed. For example, 68.5 percent of single males are simulated to have no shortfalls. This number is 42.6 percent for single females and 73.7 percent for families.

Figure 5

Distribution of 2014 Retirement Savings Shortfalls for Gen Xers, by Number of Future Years of Eligibility for Participation in a 401(k) Plan

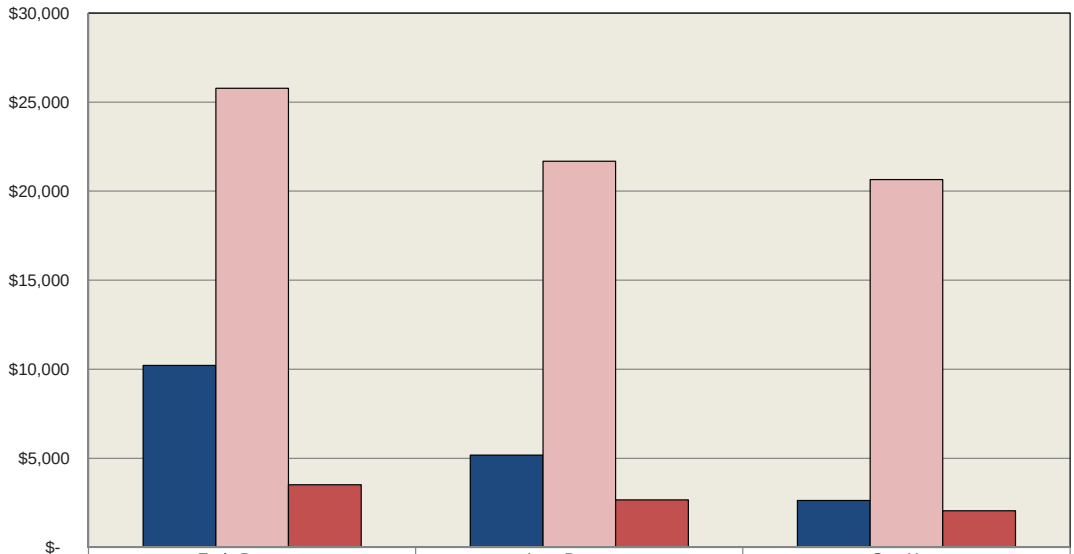


Shortfall Amount	0	1–9	10–19	20+
$1–$50,000	16.4%	9.0%	6.5%	3.9%
$50,001–$100,000	10.2%	6.8%	5.1%	2.8%
$101,000–$200,000	20.3%	14.3%	9.9%	5.2%
More Than $200,000	13.2%	8.6%	4.9%	2.3%

Source: EBRI Retirement Security Projection Model,® version 2162. The percentages in each column do not add to 100 percent because individuals *without* shortfalls are not displayed. For example, 39.9 percent of Gen Xers with no future years of eligibility for participation in a 401(k) plan are simulated to have no shortfalls. This increases to 61.2 percent for those with one to nine years of future eligibility and 73.7 percent for those with 10–19 years. For those with 20 or more years of future eligibility, 85.9 percent have no simulated deficits.

Figure 6

2014 Retirement Savings Shortfalls,*by Age Cohort, Marital Status, and Gender: Assumes No Nursing Home or Home Health Care Costs

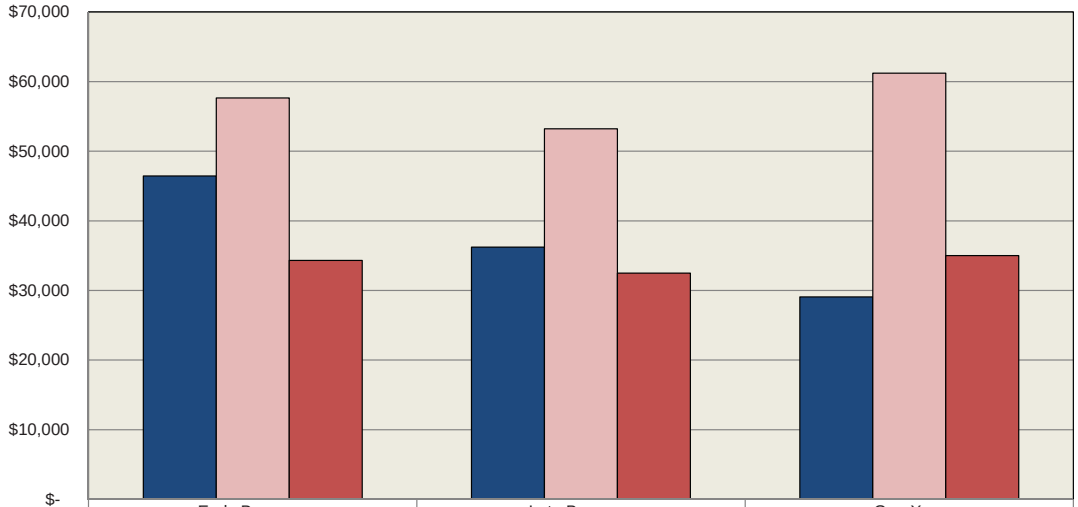


	Early Boomers	Late Boomers	Gen Xers
Single Male	$10,210	$5,175	$2,636
Single Female	$25,779	$21,681	$20,647
Married	$3,511	$2,664	$2,056

Sources: 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 7

2014 Retirement Savings Shortfalls,* for those Households with a Deficit, by Age Cohort, Marital Status, and Gender: Assumes No Nursing Home or Home Health Care Costs

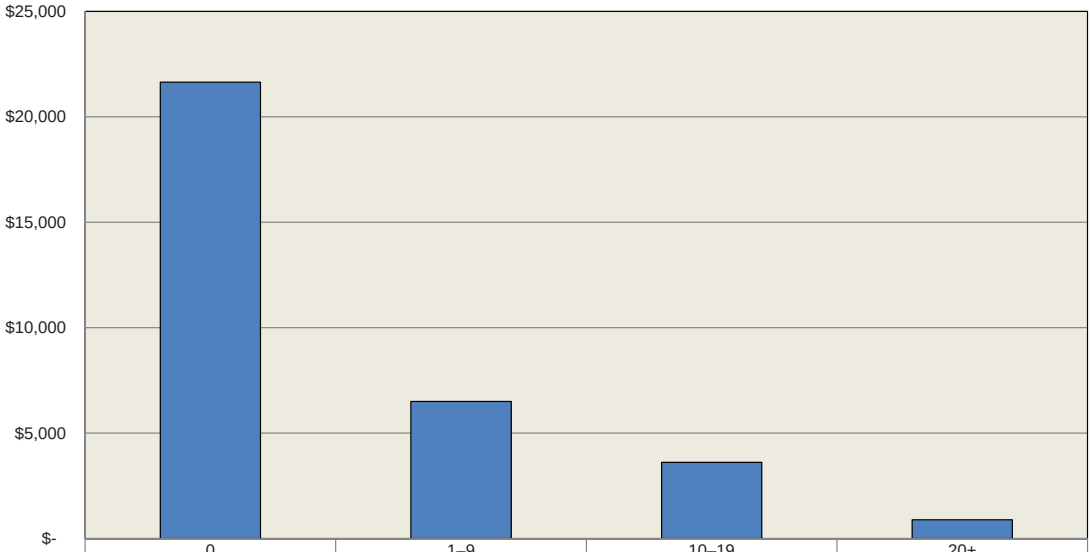


	Early Boomers	Late Boomers	Gen Xers
Single Male	$46,447	$36,210	$29,077
Single Female	$57,639	$53,224	$61,219
Family	$34,299	$32,479	$35,013

Sources: 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

2014 Retirement Savings Shortfalls* for Gen Xers, by Years of Future Eligibility for Participation in Defined Contribution Plans: Assumes No Nursing Home or Home Health Care Costs

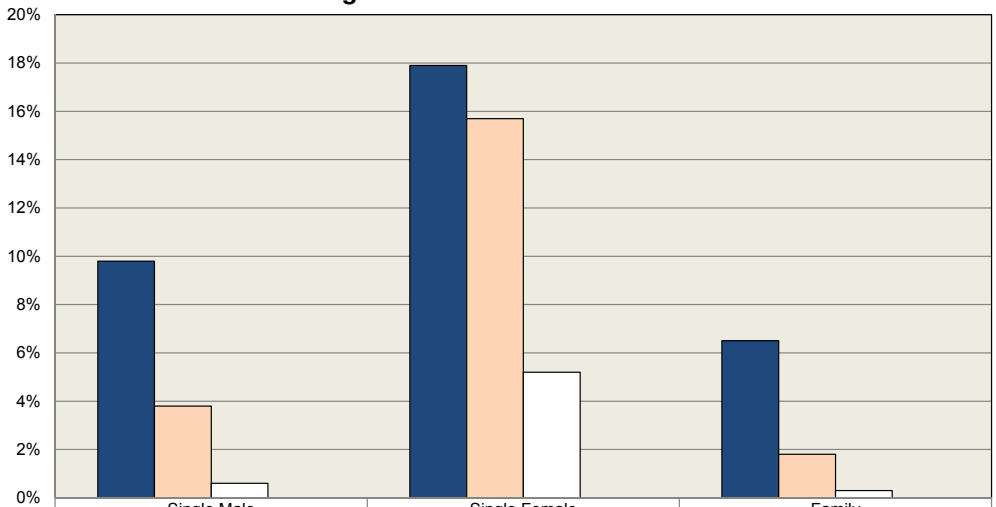


	0	1–9	10–19	20+
Total	$21,637	$6,498	$3,607	$883

Sources: EBRI Retirement Security Projection Model® version 2164.
* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

Figure 9

Distribution of 2014 Retirement Savings Shortfalls (per Individual), by Gender and Family Status: Assumes No Nursing Home or Home Health Care Costs

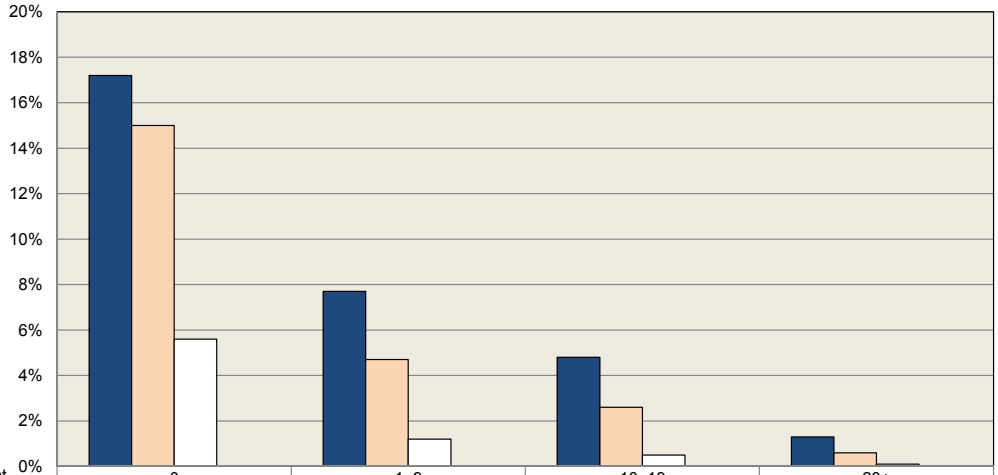


Shortfall Amount	Single Male	Single Female	Family
$1–$50,000	9.8%	17.9%	6.5%
$50,001–$100,000	3.8%	15.7%	1.8%
$101,000–$200,000	0.6%	5.2%	0.3%
More Than $200,000	0.0%	0.0%	0.0%

Source: EBRI Retirement Security Projection Model,® version 2162. Note the percentages in each column do not add to 100 percent because individuals *without* shortfalls are not displayed. For example, 85.8 percent of single males are simulated to have no shortfalls. This number is 61.2 percent for single females and 91.4 percent for families.

Figure 10

Distribution of 2014 Retirement Savings Shortfalls for Gen Xers, by Number of Future Years of Eligibility for Participation in a 401(k) Plan: Assumes No Nursing Home or Home Health Care Costs

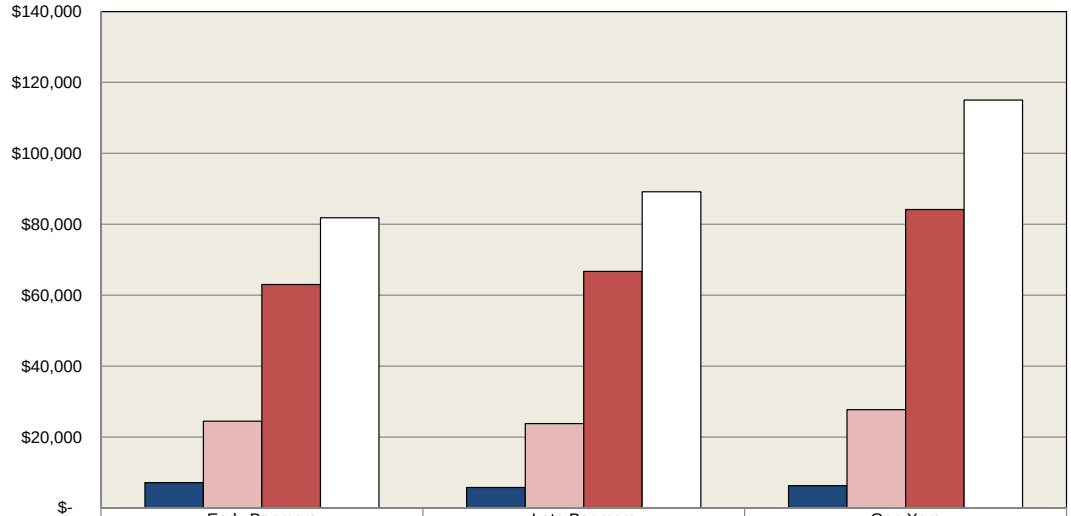


Shortfall Amount	0	1–9	10–19	20+
$1–$50,000	17.2%	7.7%	4.8%	1.3%
$50,001–$100,000	15.0%	4.7%	2.6%	0.6%
$101,000–$200,000	5.6%	1.2%	0.5%	0.1%
More Than $200,000	0.0%	0.0%	0.0%	0.0%

Source: EBRI Retirement Security Projection Model,® version 2162. The percentages in each column do not add to 100 percent because individuals *without* shortfalls are not displayed. For example, 62.3 percent of Gen Xers with no future years of eligibility for participation in a 401(k) plan are simulated to have no shortfalls. This increases to 86.4 percent for those with one to nine years of future eligibility and 92.1 percent for those with 10–19 years. For those with 20 or more years of future eligibility, 97.9 percent have no simulated deficits.

Figure 11

2014 Retirement Savings Shortfalls,*
by Age Cohort and Relative Longevity Quartile

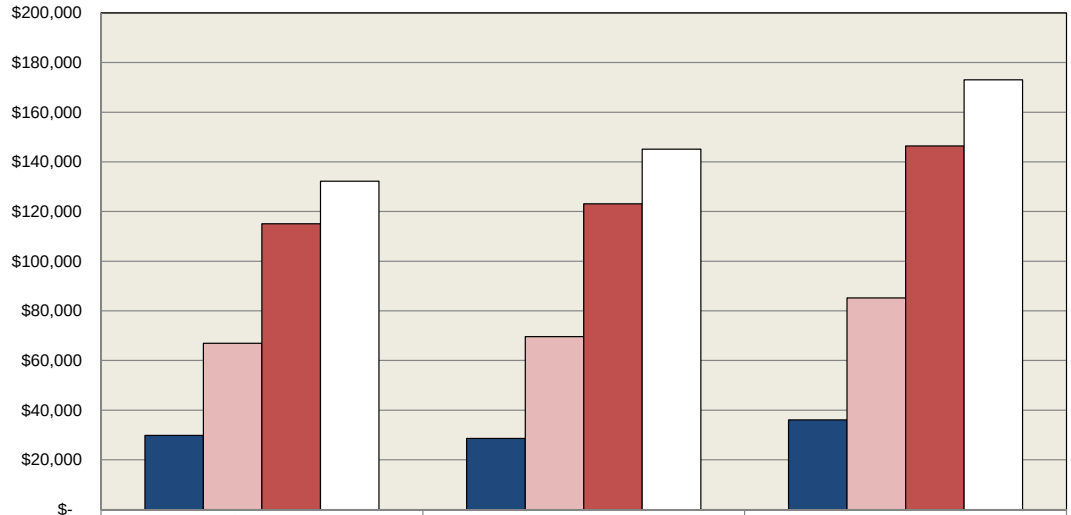


	Early Boomers	Late Boomers	Gen Xers
Earliest Quartile	$7,188	$5,823	$6,319
Second	$24,487	$23,796	$27,762
Third	$63,010	$66,723	$84,196
Latest Quartile	$81,811	$89,162	$115,029

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 12

2014 Retirement Savings Shortfalls,* for Those Households
With a Deficit, by Age Cohort and Relative Longevity Quartile

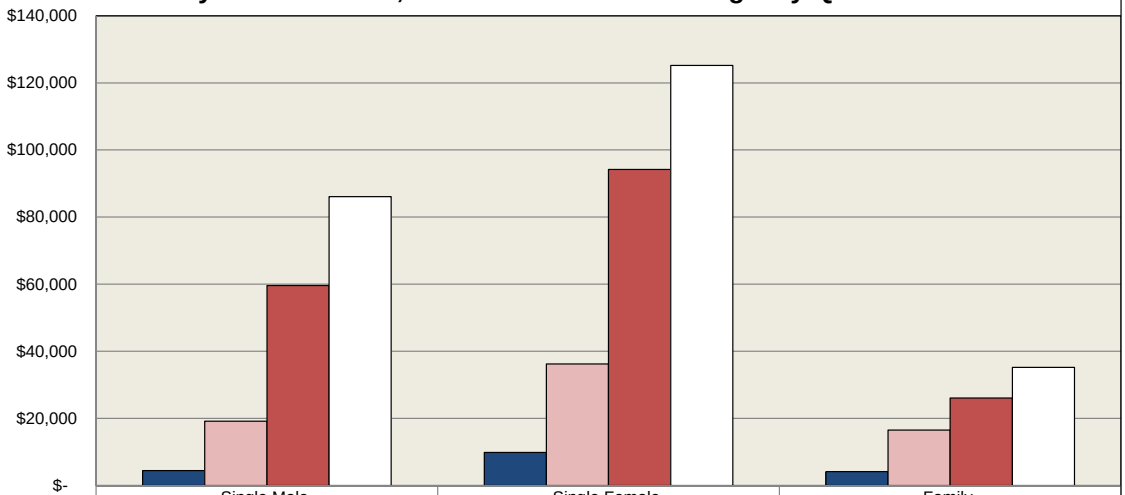


	Early Boomers	Late Boomers	Gen Xers
Earliest Quartile	$29,800	$28,611	$36,058
Second	$66,958	$69,578	$85,229
Third	$115,070	$123,079	$146,436
Latest Quartile	$132,201	$145,121	$173,069

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 13

2014 Retirement Savings Shortfalls,*
by Marital Status, Gender and Relative Longevity Quartile

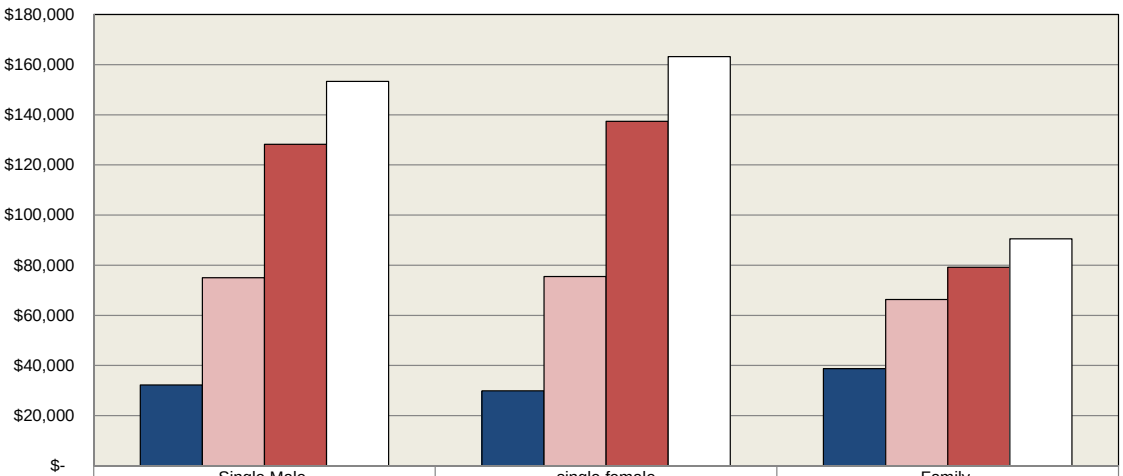


	Single Male	Single Female	Family
Earliest Quartile	$4,402	$9,853	$4,140
Second	$19,169	$36,223	$16,524
Third	$59,615	$94,218	$26,042
Latest Quartile	$86,055	$125,177	$35,163

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 14

2014 Retirement Savings Shortfalls,* for Those Households With a Deficit, by Marital Status, Gender and Relative Longevity Quartile

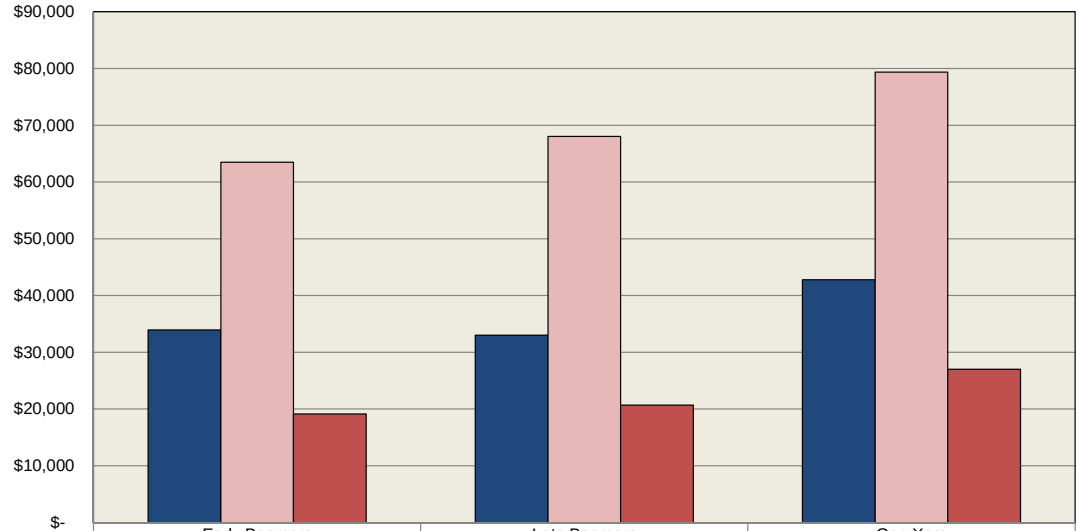


	Single Male	single female	Family
Earliest Quartile	$32,198	$29,885	$38,733
Second	$75,011	$75,516	$66,344
Third	$128,208	$137,380	$79,185
Latest Quartile	$153,300	$163,196	$90,502

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 15

2014 Retirement Savings Shortfalls,*by Age Cohort, Marital Status, and Gender: Assumes Pro-rata Reductions in Social Secrurity Retirement Benefits (Starting in 2033)

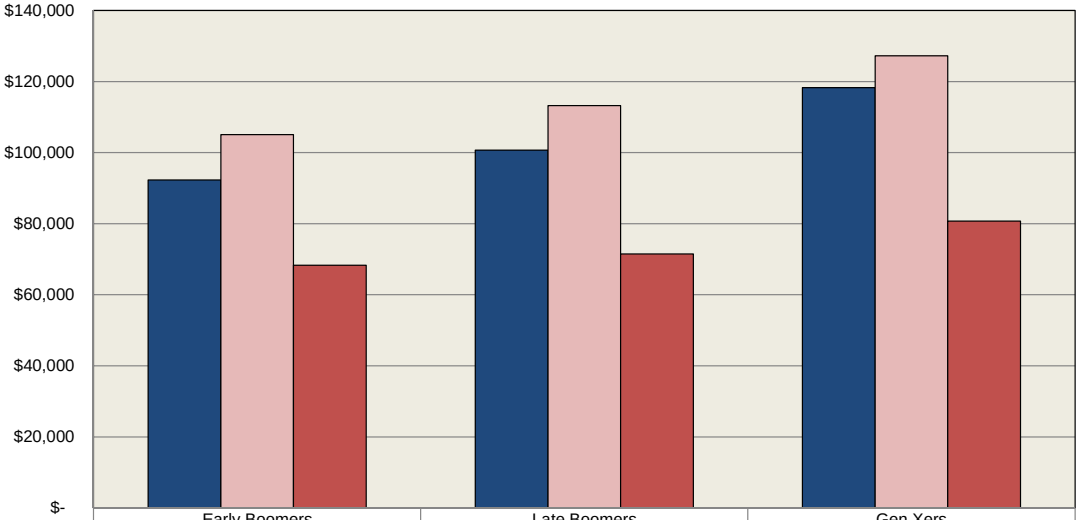


	Early Boomers	Late Boomers	Gen Xers
Single Male	$33,947	$33,019	$42,775
Single Female	$63,470	$68,045	$79,341
Married	$19,120	$20,701	$27,025

Sources: EBRI Retirement Security Projection Model® version 2166.
* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.

Figure 16

2014 Retirement Savings Shortfalls,* for Those Households With a Deficit, by Age Cohort, Marital Status, and Gender: Assumes Pro-rata Reductions in Social Secrurity Retirement Benefits (Starting in 2033)



	Early Boomers	Late Boomers	Gen Xers
Single Male	$92,294	$100,710	$118,265
Single Female	$105,044	$113,212	$127,239
Family	$68,330	$71,460	$80,709

Sources: EBRI Retirement Security Projection Model® version 2166.
* The Retirement Savings Shortfalls (RSS) are determined as a present value of retirement deficits at age 65.