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**Statement for the Record**

by

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**The Impact of Leakages on 401(k) Accumulations at Retirement Age**



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# The Impact of Leakages on 401(k) Accumulations at Retirement Age

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## Introduction

Although the deleterious effects of leakages on 401(k) “accumulations”<sup>1</sup> have been a topic of interest among policy analysts for decades, the first quantification of the effects using a microsimulation model based on actual 401(k) participant data was provided in 2002. Using the EBRI/ICI 401(k) Accumulation Projection Model, Holden and VanDerhei (2002) were able to provide replacement rates at age 65 from baseline assumptions which included cash outs, preretirement withdrawals and loan activity (in terms of reduced expected investment returns, not loan defaults). This was accompanied by a series of sensitivity analyses which quantified the impact of these three factors (Figure 1). In accordance with plan design “norms” of the time, only voluntary-enrollment 401(k) plans were considered in the simulation model.

After the enactment of the Pension Protection Act in 2006, there was a marked increase in the number of 401(k) plan sponsors that adopted automatic enrollment (AE) for some or all of their eligible workers. VanDerhei and Lucas (2010) used the EBRI Retirement Security Projection Model<sup>®</sup> (RSPM) to simulate the impact of several of the plan design and employee behavioral variables that were likely to impact AE plans that used automatic escalation of contributions. That analysis found that retirement income adequacy success rates (defined as being able to achieve an 80 percent replacement of preretirement income between Social Security benefits and purchase of an indexed annuity for the 401(k) and IRA balances) varied markedly between employees in the highest- and lowest-income quartiles, as well as the impact of the most optimistic or most pessimistic set of assumptions for plan design and employee behavior (Figure 2).

VanDerhei (February 2012) used RSPM to provide preliminary results for the impact of leakages for AE 401(k) plans. His analysis included separate sensitivity analysis for:

- Cashouts.
- Hardship withdrawals (with and without suspension of contributions).
- Plans loans (with and without defaults).
- Delays for initial participation of one or five years.

Unfortunately, at the time the empirical evidence related to plan loan defaults was still in its early stages of development. Recently, a new study using Vanguard data<sup>2</sup> provides the probit estimates necessary to incorporate this information into RSPM. This model (with the loan default enhancements) will be used to provide quantitative estimates of the percentage point decrease in probability of success by income quartile of each of the leakage factors in isolation and in combination. Instead of using only an 80 percent real replacement rate threshold as in the 2012 analysis, the simulation results for this testimony will also consider alternative thresholds.

The next section of this testimony provides a brief overview of previous RSPM results on retirement income adequacy. This is followed by an analysis of the potential of 401(k) plans to produce adequate retirement income in the absence of plan leakages. This serves as a baseline to the next section where the impact of 401(k) leakages are analyzed. The final section provides a brief summary of the current analysis and outlines plans for future research.

## EBRI Retirement Security Projection Model® Results

Previous work with RSPM has primarily focused on one or more of the following four output metrics for retirement income adequacy:<sup>3</sup>

- Retirement Readiness Ratings.
- Years until the household runs short of money in retirement.
- Retirement Savings Shortfalls.
- Percentage of additional compensation that must be saved annually until retirement for a 50, 75 or 90 percent chance of covering simulated expenses.

These metrics have been used to analyze the impact of retirement plans on prospects for retirement income adequacy under several scenarios, including:

- **Annuitizing defined contribution and individual retirement account (IRA) balances at retirement age:** A 2004 EBRI publication<sup>4</sup> analyzed the impact of annuitizing defined contribution and individual retirement account (IRA) balances at retirement age. That analysis required that we first simulate a significant number of future life-paths to capture the longevity risk experienced by retirees. The output metric used was the median percentage of additional compensation that must be saved annually until retirement to provide a 75 percent chance of covering simulated expenses. If one assumes that all defined benefit participants take a lump-sum distribution at retirement, the average annual increase in needed savings is 14.9 percent, whereas assuming that all individual accounts are annuitized at retirement has an impact twice as large—but in the opposite direction (a 30.0 percent decrease in needed annual savings).
- **Impact of the financial crisis:** In a 2011 EBRI publication,<sup>5</sup> the model was used to analyze the impact of the 2008–2009 crisis in the financial and real estate markets on retirement income adequacy. The analysis in this paper was designed to answer two questions: (1) What percentage of U.S. households were now “at risk” of insufficient retirement income as a result of the financial market and real estate crisis in 2008 and 2009, and (2) Of those who were then now at risk, what additional savings do they need to make each year until normal retirement age to make up for their losses from the crisis? The percentage of households that would not have been “at risk” but for the impact of the 2008–2009 crisis varies from a low of 3.8 percent to a high of 14.3 percent. Looking at all Early Boomer households that would need to save an additional amount (over and above the savings already factored into the baseline model), the median percentage of additional compensation for these households desiring a 50 percent probability of retirement income adequacy would be 3.0 percent of compensation each year until retirement age to account for the financial and housing market crisis in 2008 and 2009. Looking at all Early Boomer households that would need to save an additional amount (over and above the savings already factored into the baseline model), the median percentage of additional compensation for these households desiring a 90 percent probability of retirement income adequacy would be 4.3 percent of compensation. Looking only at Early Boomer households that would need to save an additional amount (over and above the savings already factored into the baseline model), that had account balances in defined contribution plans and IRAs as well as exposure to the real estate crisis in 2008 and 2009 shows a median percentage for of 5.6 percent for a 50 percent probability and 6.7 percent for a 90 percent probability of retirement income adequacy
- **Impact of defined benefit plans:** Another 2011 EBRI publication<sup>6</sup> used RSPM to analyze the impact of defined benefit plans in achieving retirement income adequacy for Baby Boomers and Gen Xers. This article shows the tremendous importance of defined benefit plans in achieving retirement income adequacy for Baby Boomers and Gen Xers. Overall, the presence of a defined benefit accrual at age 65 reduces the “at-risk” percentage by 11.6 percentage points. The defined benefit plan advantage (as measured by the gap between the two at-risk percentages) is

particularly valuable for the lowest-income quartile but also has a strong impact on the middle class (the reduction in the at-risk percentage for the second and third income quartiles combined is 9.7 percentage points).

- **Impact of deferring retirement age:** As explored in another 2011 *EBRI publication*<sup>7</sup> RSPM added a new feature that allows households to defer retirement age past age 65 in an attempt to determine whether retirement age deferral is indeed sufficiently valuable to mitigate retirement income adequacy problems for most households (assuming the worker is physically able to continue working and that there continues to be a suitable demand for his or her skills). The answer, unfortunately, is not always “yes,” even if retirement age is deferred into the 80s. RSPM baseline results indicate that the lowest preretirement income quartile would need to defer retirement age to 84 before 90 percent of the households would have a 50 percent probability of success. Although a significant portion of the improvement takes place in the first four years after age 65, the improvement tends to level off in the early 70s before picking up in the late 70s and early 80s. Households in higher preretirement income quartiles start at a much higher level, and therefore have less improvement in terms of additional households reaching a 50 percent success rate as retirement age is deferred for these households. If the success rate is moved to a threshold of 70 percent, only 2 in 5 households in the lowest-income quartile will attain retirement income adequacy even if they defer retirement age to 84. Increasing the threshold to 80 percent reduces the number of lowest preretirement income quartile households that can satisfy this standard at a retirement age of 84 to approximately 1 in 7. One of the factors that makes a major difference in the percentage of households satisfying the retirement income adequacy thresholds at any retirement age is whether the worker is still participating in a defined contribution plan after age 65. This factor results in at least a 10 percentage point difference in the majority of the retirement age/income combinations investigated. A 2012 *EBRI publication*<sup>8</sup> 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.
- **Impact of the low interest rate environment:** A 2013 *EBRI publication*<sup>9</sup> 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 the historically low interest rates at the time were assumed to be a permanent condition.

In certain circumstances, only the accumulation portion of RSPM is used to focus on the impact of retirement plans (including IRA rollovers) and Social Security on retirement income (without running the decumulation portion of the model):

- **Freezing of defined benefit plan accruals:** The model was used to evaluate the impact of defined benefit 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 in a 2006 *EBRI publication*.<sup>10</sup> The median annual contribution rate needed to financially indemnify a participant in a career-average defined benefit pension plan whose plan was frozen in 2006 would be about 7 percent, assuming an 8 percent rate of return. A contribution rate of about 15 percent would cover three-quarters of the employees in this type of plan. The median contribution rate for a final-average plan is slightly larger: 8 percent (assuming an 8 percent return); a contribution rate of 16 percent would cover three-quarters of the workers in this type of plan. For workers in hybrid pension (cash balance) plans, the median contribution rate would be about 3 percent; a contribution rate of 4.5 percent would cover three-quarters of the workers, based on current interest credits. In all of these scenarios, the rate of return on investments has a major impact on the contribution rate; lower rates would require higher contributions to offset the benefit loss from a pension freeze.

- This analysis was expanded for a 2010 Pension Research Council publication<sup>11</sup> that involved a “winners/losers” analysis of defined benefit freezes and the enhanced employer contributions provided to defined contribution plans at the time the defined benefit plans were frozen. The analysis focused on the percentage of those with DB wealth foregone due to the freeze who are expected to have a larger total nominal replacement rate from DC enhanced contributions (if any). As expected, young employees have the highest percentage, with nearly 40 percent of those between 20 and 24 ending up with more retirement wealth from the annuitized account balances from the enhanced contributions than they would have had under the additional DB accruals. This percentage drops to six percent for those ages 55–59.
- **Impact of a transition from defined benefit to defined contribution plans:** A 2013 *EBRI publication*<sup>12</sup> used RSPM to provide a direct comparison of the likely benefits under specific types of defined contribution and defined benefit retirement plans. The results presented show that if historical rates of return are assumed as well as annuity purchase prices reflecting average bond rates over the last 27 years, the median pairwise comparisons result in a strong outcome advantage for VE 401(k) plans over both the stylized, final-average DB plan and the stylized cash balance plan. When the robustness of these findings are subjected to various “stress tests” by reducing the rate of return assumptions by 200 basis points and increasing the annuity purchase price to reflect today’s bond rates, results show that in many cases the VE 401(k) plans lose their comparative advantage to the stylized, final-average DB plans (at least at the median) for lower-paid employees; however, VE 401(k) plans’ median advantages over the stylized cash balance plans remain in force. When the simulation results are subjected to both stresses simultaneously, virtually all of the median differences between the VE 401(k) plans and the stylized, final-average DB plan are reversed, regardless of income quartile. However, even in this scenario, based on the median differences, virtually all of the participants will do better in the VE 401(k) plans than the stylized cash balance plan.
- Another 2013 EBRI publication<sup>13</sup> used RSPM to expand the previous analysis. Rather than trying to reflect the real-world variation in defined benefit accruals, the baseline analysis in the previous 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 defined benefit 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 and found the median DB accrual that males with 31–40 years of plan eligibility would need to generate the same retirement income that they are projected to have with a 401(k) is 2.0 percent of final compensation, if they are in the lowest-income quartile. This increases to 2.2 percent for the next income quartile and 2.5 percent for the third-income quartile. Those in the highest-income quartile would need a 3.0 percent accrual for equivalency. When the model analyzed the impact of simultaneously reducing the assumed rates of return by 200 basis points and assuming future annuity purchase prices are equivalent to today’s historically high rates, the median DB accrual that males with 31–40 years of plan eligibility would need to have the same retirement income that they are projected to have with a 401(k) plan is 1.1 percent of final compensation, if they are in the lowest-income quartile. This represents a 45 percent reduction from the 2.0 percent value under the baseline assumptions.
- **Assessment of automatic enrollment 401(k) plans relative to voluntary enrollment plans:** RSPM was significantly enhanced for a 2008 EBRI publication<sup>14</sup> by allowing automatic enrollment of 401(k) participants with the potential for automatic escalation of contributions to be included. The results showed that the median 401(k) accumulations for the lowest-income quartile of these workers (assuming all 401(k) plans were voluntary enrollment) would only be 0.1 times final earnings at age 65 (this is largely due to the fact that 41 percent of workers—as opposed to participants—were assumed to have zero balances at age 65). However, if all 401(k) plans are assumed to be using the auto-enrollment provisions under PPA, the median 401(k)



accumulations for the lowest-income quartile jumps to 2.5 times final earnings under the most conservative assumptions and 4.5 times final earnings under the most beneficial assumptions. Even for the top 25 percent of these workers (when ranked by 401(k) accumulations as a multiple of final earnings), there are large increases: the multiple under a voluntary-enrollment scenario is 1.8 times final earnings, whereas auto-enrollment provides multiples ranging from 6.5 to 10.4, depending on auto-escalation of contributions.

- **Analysis of employer contributions when converting from voluntary enrollment to automatic enrollment and its implications for retirement income:** The model was completely re-parameterized with 401(k)-plan design parameters for sponsors that had adopted automatic-enrollment provisions for a 2010 EBRI publication<sup>15</sup> and found that, under baseline assumptions, the median 401(k) accumulations for the lowest-income quartile of workers currently age 25–29 (assuming all 401(k) plans were voluntary enrollment plans as typified by the 225 large plan sponsors analyzed in the study) would only be 0.08 times final earnings at age 65. However, if all 401(k) plans are assumed to be using the large plan sponsor auto-enrollment provisions, the median 401(k) accumulations for the lowest-income quartile jumps to 4.96 times final earnings (if 401(k) participants revert back to the default contribution when they change jobs) and 5.33 times final earnings (if they retain their previous contribution level when they change jobs). There are also large increases even for high-income workers: The multiple under a voluntary enrollment scenario is 2.41 times final earnings compared with 9.15 or 9.81 under auto-enrollment, depending on the assumptions for employee reversion to default contribution rates upon job change.
- **The impact of plan design and employee behavior for automatic escalation provisions in automatic enrollment plans:** Another 2010 *EBRI publication*<sup>16</sup> expanded upon earlier work 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. The results in this paper demonstrate the profound influence of plan design variables, as well as assumptions of employee behavior in auto-enrollment 401(k) plans. Even with a relatively simple definition of “success,” large differences in success rates can be seen, depending on which plan design factors and employee behavior assumptions are used. The probability of success for the lowest-income quartile increases from the baseline probability of 45.7 percent to 79.2 percent when all four factors are applied. The impact on the highest-income quartile is even more impressive, with an increase in the probability of success from 27.0 percent to 64.0 percent.
- **The impact of increasing default contributions for automatic enrollment plans:** A 2012 *EBRI publication*<sup>17</sup> analyzed the impact of increasing the default-contribution rate for automatic enrollment 401(k) plans with automatic escalation of contributions. Under a set of specified behavioral assumptions, more than a quarter of those in the lowest-income quartile who had previously NOT been successful under actual default contribution rates were found to be successful as a result of the change in deferral percentage. When employees in the highest-income quartile were analyzed under the same set of assumptions, the percentage of those who had NOT previously been successful (under the actual default contribution rates) that now ARE successful as a result of the change in deferral rate was 18.4 percent.

## **The Potential of 401(k) Plans to Produce Adequate Income Replacement**

The EBRI/ICI 401(k) database has been used to provide annual reports based on actual account balances of large cross sections of the 401(k) plan participant universe since 1996.<sup>18</sup> Looking at consistent participants in the EBRI/ICI 401(k) database in the wake of the financial crisis (over the four-year period from year-end 2007 to year-end 2011), a joint EBRI/Investment Company Institute (ICI) analysis found that the average 401(k) account balance fell 34.8 percent in 2008, then rose from 2009 to 2011.<sup>19</sup> Overall,

the average account balance in this consistent sample increased at a compound annual, average growth rate of 5.4 percent over the 2007–2011 period.

While this information is certainly useful to evaluate assertions (and anecdotal claims) with respect to the impact of the financial crisis on 401(k) plans, it needs to be supplemented with simulation modeling for a proper evaluation of the potential of 401(k) plans to produce “adequate” income replacement for several reasons:

- The EBRI/ICI 401(k) database does not contain information on individual retirement account (IRA) rollovers and therefore may only represent a fraction of a participant’s retirement accumulations if he or she has had job changes.
- Even if one looks only at 401(k) participants who have had decades of tenure with their current employer, there is a significant likelihood that they would not have been eligible to participate in a 401(k) plan during their entire career with the current employer.<sup>20</sup>
- Since the passage of the Pension Protection Act of 2006, many of the 401(k) plans that had previously allowed eligible employees to voluntarily enroll have been modified to automatically enroll eligible employees. While employees have the ability to opt out of such enrollment, it is clear that these plans have had a substantial impact on increasing retirement plan-participation rates, especially for lower-income employees.<sup>21</sup>
- An analysis based solely on current balances will not incorporate the impact of future employee activity (such as potential cashout behavior at job change), nor the impact of future financial market returns.

To assist in the evaluation of the role of 401(k) plans, EBRI has used its RSPM to analyze the potential of 401(k) plans to produce “adequate” income replacement.<sup>22</sup> The analysis provides probabilities of successful retirement (defined below) by income quartile for 401(k) plans. Given that the objective of this analysis typically focuses on the *potential* for 401(k) plans to produce a threshold level of income replacement at retirement, the analysis is limited to individuals who are simulated to have more than 30 years of eligibility to participate (whether or not they actually choose to participate in each of those years) by the time they reach age 65.<sup>23</sup>

Figure 3 summarizes the projections for the percentage of “successful” retirements for 401(k) participants, by income quartile, for those currently ages 25–29 in an automatic-enrollment 401(k) plan assuming no leakages. Workers are assumed to retire at age 65, and all balances are converted into an inflation-adjusted annuity at an annuity purchase price of 18.62 at that point.<sup>24</sup> The annual income provided by this annuity in the first year of retirement is added to the simulated Social Security retirement benefit provided for the worker (spousal benefits are not included), and the combined retirement income is expressed as a percentage of the salary the worker was simulated to have earned at age 64.

One difficulty in evaluating the potential of any type of retirement income source is the determination of the threshold for “success.” While there have been a number of attempts to quantify this in the past,<sup>25</sup> there appears to be little consensus on the appropriate level(s).<sup>26</sup> Therefore, this analysis uses four alternative “success” thresholds: attaining 60, 70, 80 and 90 percent (respectively) of the preretirement income replaced by the combination of the annuitized value of the 401(k) accumulations<sup>27</sup> combined with the primary Social Security benefit amounts.

The simulated analysis for Figure 3 assumes that 401(k) sponsors adopting automatic-enrollment provisions also adopt an automatic annual escalation of contributions. Note that while automatic-enrollment plans have been in place for a number of years, there has been a substantial increase in the proportion of employers incorporating some type of an automatic-escalation feature as a result of the Pension Protection Act of 2006. However, it will be a number of years before these provisions have been



in place long enough to accurately assess participant response with respect to items such as opt-out behavior and whether participants will retain their current savings rates when they change jobs or simply revert to the default deferral rate in the plan of the new employer. In the current analysis, plans are assumed to have automatic escalation with a 1 percent of compensation increase annually along with the current plan-specific default contribution rates.<sup>28</sup> Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and to opt out of automatic escalation in accordance with the probabilities outlined in VanDerhei (September 2007).

The bottom row in the grid for Figure 3 shows that for the lowest-income quartile,<sup>29</sup> 92.3 percent of the workers currently ages 25–29 who will have more than 30 years of eligibility for participation in a 401(k) plan are simulated to be able to replace at least 60 percent of their age-64 salary from their annuitized 401(k) accumulations and Social Security. This percentage decreases somewhat for their higher-income counterparts, but goes no lower than 83.2 percent.

The third row from the bottom in the grid for Figure 3 provides the same results when the threshold is increased to 70 percent. As expected, the percentage of workers able to meet this more stringent threshold decreases, and the percentage of those in the lowest-income quartile with successful retirements under this analysis is now 86.6 percent. The percentages for the second-, third-, and fourth-income quartiles are somewhat smaller, but none are less than 72.2 percent.

The second row in the Figure 3 grid illustrates the impact of increasing the threshold for success to 80 percent. Again, the progressive nature of the benefit formula in Social Security produces a much higher probability of success for the lowest-income quartile (76.5 percent) than the highest-income quartile (60.7 percent). The top row provides similar results for a 90 percent real replacement rate threshold. In this case the probabilities range from 64.5 percent for the lowest-income quartile to 51.0 percent for the highest income quartile.

## **401(k) Leakage and the Impact on Retirement**

The analysis for this testimony will focus on the impact of the following three leakages on 401(k) accumulations:

- Cashouts.
- Plan loan defaults.
- Hardship withdrawals accompanied by a six month suspension of contributions.

Figure 4 shows the impact of leakages for automatic enrollment plans, assuming no participant behavior change in participation, contribution or asset allocation when all three types of leakages described above are combined. The impact is analyzed by both pre-retirement income quartile and real replacement rate threshold. For example, in the upper right hand grid for Figure 4 indicates that, for the population analyzed (workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan), 9.9 percent of the lowest-income quartile 401(k) participants who would have reached the 90 percent real replacement rate threshold if none of the three leakages were present would have a lower real replacement rate in the presence of all three leakages. The probability of success decreases to 8.8 percent of the lowest income quartile 401(k) participants if we only impose an 80 percent real replacement rate threshold, at a 70 percent threshold it decreases further to 7.9 percent and at a 60 percent threshold only 5.6 percent are impacted.

Figure 5 shows the same impact as that presented in Figure 4, but this time the output metric is the percentage of those not reaching the threshold replacement rate when leakages exist who would reach the threshold replacement rate if the leakages were eliminated. Once again using the lowest-income quartile

at a 90 percent real replacement rate threshold, 64.5 percent of this cohort are projected to have a “successful” retirement outcome in the absence of leakages (Figure 3), but nearly 1 in 10 (9.9 percent) would end up with something less than 90 percent in the presence of all three leakages (Figure 4). Said another way, 54.6 percent of them would have reached the 90 percent threshold when all three leakages are considered and 45.4 percent would not. Of those 45.4 percent, 21.8 percent (9.9/45.4) would reach the threshold if the leakages were removed.

The 21.8 percent value is shown in the upper left hand side of the grid for Figure 5. This increases to 27.3 percent when analyzed at the lower 80 percent real replacement rates, 37.1 percent at a 70 percent real replacement rate and 41.9 percent if the threshold is reduced to a 60 percent real replacement rate. Similar values are also shown in Figure 5 for those in the second-, third-, and highest income-quartile but the impact is less as the income quartile increases.

In an attempt to isolate how much of this might be attributed to each of the three leakages, Figures 6, 7 and 8 provide a similar analysis as that shown in Figure 4 but for each of the three leakages individually. Figure 6 shows the impact comparison between no leakages vs. defaults on plan loans, while the comparison scenario in Figure 7 is no leakages vs. hardship withdrawals with six-month suspension of contributions. Figure 8 compares the no leakages scenario impact against one that includes probabilistic cashouts (as a function of age and account balance) at job change.

Figures 9, 10 and 11 apply the same output metric as Figure 5 (the percentage of those not reaching the threshold replacement rate when leakages exist who would reach the threshold replacement rate if the specific type of leakages being analyzed were removed).

Figure 9 shows the comparison between no leakages vs. the impact of plan loan defaults. The impact on the lowest income quartile varies between 3.2 and 4.5 percent (depending on the level of the real replacement rate threshold). The values typically remain below 5 percent for the higher-income cohorts with the exception of the highest-income quartile, which at a 60 percent real replacement rate threshold reaches 8.1 percent.

The comparison scenario in Figure 10 is no leakages vs. hardship withdrawals with six-month suspension of contributions. The impact on the lowest-income quartile ranges between 5.5 and 8.2 percent (depending on the level of the real replacement rate threshold). The values drop substantially for the highest-income quartile, with a range of 2.4 to 5.1 percent.

Figure 11 compares the no-leakages scenario with one that includes probabilistic cashouts (as a function of age and account balance) at job change. The values shown on this graph are much greater than those in Figures 9 or 10, indicating that cashouts at job change have a much more serious impact on 401(k) accumulation than either plan loan defaults or hardship withdrawals (even with the impact of a six-month suspension of contributions included). The values for the lowest-income quartile range from 13.9 percent at the 90 percent real replacement threshold to 38.3 percent at the 60 percent threshold. Not surprisingly, the impact is smaller as the level of income increase. The range for the highest income quartile is 8.1 percent at the 90 percent real replacement threshold to 23.9 percent at the 60 percent threshold.

## Summary and Future Research

The simulation results for this testimony suggest 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 thirty 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. However, this analysis needs to be accompanied by a very strong caveat that, prior to policy making, there are clear data gaps that will need to be filled. For example, Holden and VanDerhei (2001) found that participants in plans with a loan option have higher contribution rates than those without such access, *et. par.* It is likely that a similar relationship exists with respect to the availability of hardship withdrawals. The potential reduction in participation and contribution rates from reducing or eliminating access to cashouts at job change would likely be even greater; however, since this is not a plan design variable that be controlled by the plan sponsor, there is no way to quantify the likely impact based on historical data.

Given the extreme relevance of this topic to retirement policy, EBRI plans to add questions to the 2015 Retirement Confidence Survey in an attempt to model the potential tradeoffs between pre-retirement access to 401(k) funds and participation/contribution decisions. If possible, we will expand this analysis to a survey of plan sponsors to provide at least preliminary evidence on the possible impact of this type of change on plan design decisions as well. EBRI would be pleased to share the results of this new analysis to the ERISA Advisory Council when it is available.

While EBRI's analysis indicates that, in the absence of any behavioral changes by plan sponsors or participants, retirement income adequacy could be improved by reducing "leakage," any legislative or regulatory effort to change current plan design features should include a careful analysis of the following:

1. Would limiting current levels of access to participant accounts be imposed in the form of a mandate or would plan sponsors have flexibility in deciding whether (and perhaps to what extent) they would participate? The impact of PPA in increasing the incentives for adopting automatic enrollment 401(k) plans without mandating that 401(k) sponsors take this step may serve as an example of how plan design variables may be optimized for employers and their employees if sufficient flexibility is provided.
2. Would limiting opportunities for "leakage" be restricted to new money only or would these restrictions be applied retroactively to contributions made at a point when employees had a reasonable expectation that the existing rules would continue to apply? Obviously in the former case, it will take much longer for the account balance increase projections to be realized (however, note that all the simulation results in this testimony were for employees currently 25–29 and hence virtually all contributions could be considered "new money").

## **Appendix A: Brief Description of EBRI's Retirement Security Projection Model<sup>®</sup>**

One of the basic objectives of the Retirement Security Projection Model<sup>®</sup> (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 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 would 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.
- Defined contribution (DC) balances.
- Individual retirement account (IRA) balances.
- Defined benefit (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 income and marital status) 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.

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

- The 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 potentially catastrophic nursing home and home-health-care risks. The first state-level RSPM results were presented to the Kansas' Long-Term Care Services Task Force on July 11, 2002 (VanDerhei and Copeland, July 2002), and the results of the Massachusetts study were presented on 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, 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 defined benefit 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 defined benefit freezes and the enhanced employer contributions provided to defined contribution plans at the time the defined benefit 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 (RSS) 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*, the 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 defined benefit plans in achieving retirement income adequacy for Baby Boomers and Gen Xers.
- In September, 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 the 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 defined benefit 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 baseline analysis in the previous 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).

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## Endnotes

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<sup>1</sup> In this analysis, 401(k) accumulations consist of 401(k) balances plus IRA rollover balances originating in 401(k) plans.

<sup>2</sup> Lu, Mitchell, Utkus and Young (2014).

<sup>3</sup> EBRI's use of RSPM typically is confined to analysis of the current retirement system. However, it has periodically been used to evaluate potential changes to the system, primarily from proposed legislative changes. In a 2011 EBRI publication (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. Later 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 another 2011 EBRI publication (VanDerhei, November 2011). A 2012 EBRI publication (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. A 2013 EBRI publication (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 defined benefit plan under current law.

<sup>4</sup> VanDerhei and Copeland (2004)

<sup>5</sup> VanDerhei (February 2011)

<sup>6</sup> VanDerhei (August 2011)

<sup>7</sup> VanDerhei and Copeland (2011)

<sup>8</sup> VanDerhei (August 2012)

<sup>9</sup> VanDerhei (June 2013b)

<sup>10</sup> VanDerhei (March 2006)

<sup>11</sup> Copeland and VanDerhei (2010)

<sup>12</sup> VanDerhei (June 2013a)

<sup>13</sup> VanDerhei (December 2013)

<sup>14</sup> VanDerhei and Copeland (2008)

<sup>15</sup> VanDerhei (April 2010)

<sup>16</sup> VanDerhei and Lucas (2010)

<sup>17</sup> VanDerhei (September 2012)

<sup>18</sup> See VanDerhei, Holden, Alonso and Bass (December 2013) for the most recent results.

<sup>19</sup> VanDerhei, Holden, Alonso and Bass (October 2013).

<sup>20</sup> The proposed regulations for 401(k) plans were first introduced in November of 1981, and it took several years for many sponsors to introduce the plans. Moreover, many plans that were originally introduced as supplemental plans to existing defined benefit plans have been modified to provide more generous employer contributions at the time the defined benefit plans were frozen (VanDerhei, April 2010).

<sup>21</sup> See Figure 23 of Utkus and Young (2013) for recent evidence.

<sup>22</sup> Additional details on RSPM and the assumptions used in 2013 can be found in VanDerhei (June 2013b). The financial-market results are generated from stochastic annual returns with a log-normal distribution and an arithmetic mean of 8.6 percent real return for stocks and 2.6 percent real return for bonds.

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<sup>23</sup> For an indication of how years of eligibility impact overall Retirement Readiness Ratings, see VanDerhei (June 2013b). This analysis simulates the impact of *future* years of eligibility for a defined contribution plan on the probability of households *not* running short of money in retirement. As can be seen in Figure 3 of that analysis, the probability that a Gen-Xer household with no future years of defined contribution eligibility will not run short of money in retirement is 38.6 percent. This increases to 59.8 percent for Gen-Xer households with one to nine years of future eligibility and 73.4 percent for those with 10–19 years. More than 17 out of 20 (86.1 percent) of Gen-Xer households with more than 20 years of future eligibility are simulated to not run short of money in retirement. This analysis was for all income quartiles combined. Similar results are found when controlling for relative levels of pre-retirement income (see Figure 4 of VanDerhei May 2012).

<sup>24</sup> The annuitization of the balances are performed only for purposes of providing an income stream that can be added to the inflation-adjusted annuity provided by Social Security. Indeed, only a small percentage of defined contribution participants currently annuitize their entire account balance at retirement (and even a smaller percentage purchase an inflation-adjusted annuity for the entire amount). When RSPM is used to compute the Retirement Readiness Rating (the probability that a particular cohort will not run short of money in retirement), the defined contribution and IRA balances are not assumed to be annuitized but instead are assumed to be spent down as needed.

<sup>25</sup> See MacDonald and Moore (2011) for a very thorough review of the literature.

<sup>26</sup> One reason for this is the need to determine how potentially catastrophic health care costs (such as nursing home costs) in retirement will be handled. Even though these costs will not be an issue for all retirees, and certainly not a problem in every year of retirement, a multi-year stay in a nursing home in retirement may deplete the retirement savings of a household to the point where it eventually runs short of money in retirement. See VanDerhei (August 2012) for more detail.

<sup>27</sup> The phrase “401(k) accumulations” in this analysis denotes both accumulations in 401(k) accounts at retirement age as well as IRA rollovers that originated from 401(k)-plan accumulations.

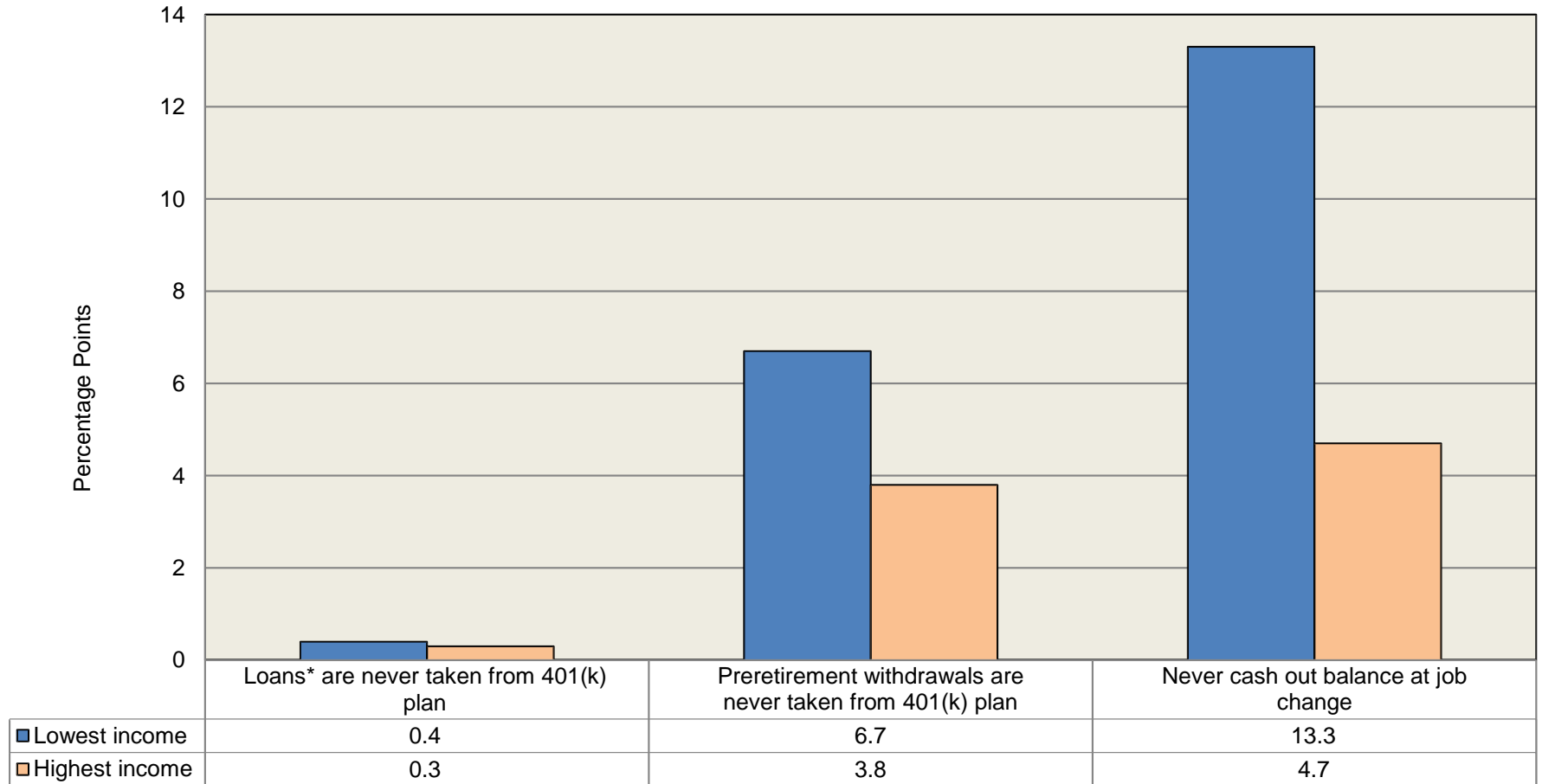
<sup>28</sup> VanDerhei (September 2012) simulated the impact of increasing the current plan-specific default rates (typically 3 percent of compensation) to 6 percent. Under a set of specified behavioral assumptions, more than a quarter of those in the lowest-income quartile who had previously *not* been successful under actual default contribution rates were found to be successful as a result of the change in deferral percentage.

<sup>29</sup> RSPM needs to use information during the worker’s entire career to determine pre-retirement income quartiles (similar to the calculation of average indexed monthly earnings (AIME) for Social Security). This is explained in endnote 17 of VanDerhei and Copeland (2010).



Figure 1  
**Impact of Leakages on Voluntary Enrollment 401(k) Plans: 2002 Assumptions**

Change in median replacement rates from 401(k) “accumulations” relative to baseline model for participants reaching age 65 between 2030 and 2039

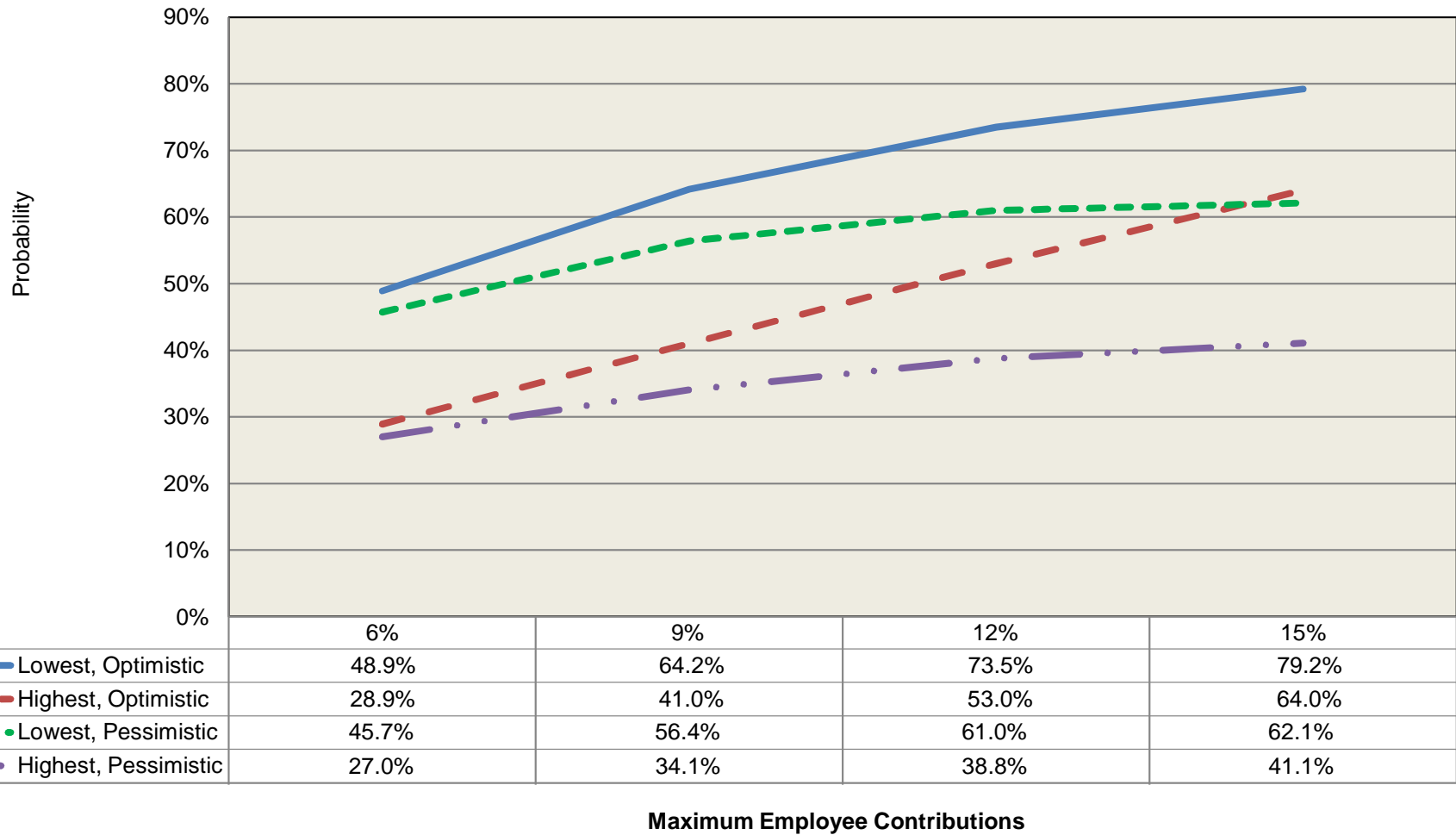


Source: Holden and VanDerhei (2002).

\*Loan defaults are not included in this analysis.

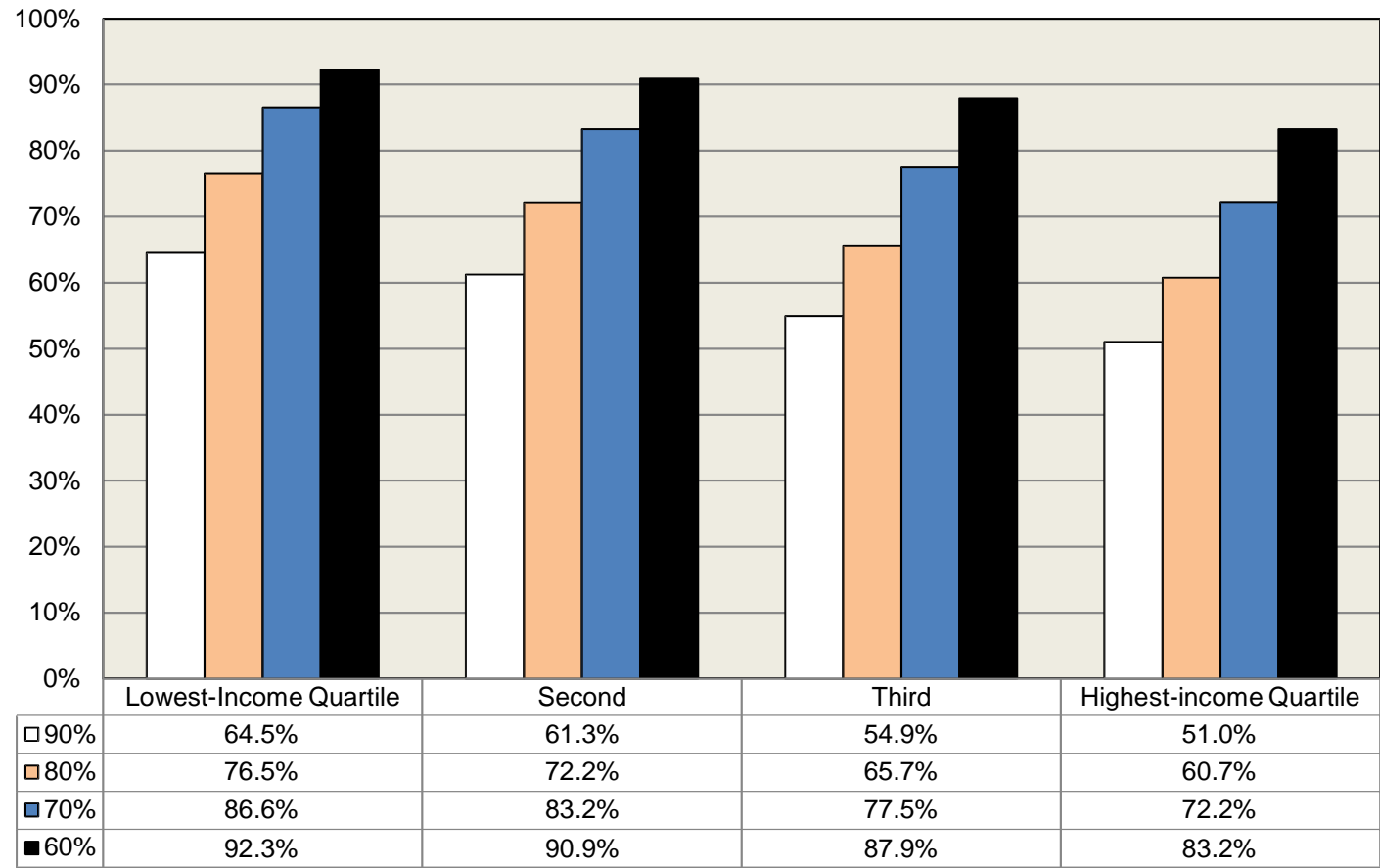
Median replacement rates = 50.7 and 67.2 percent for lowest and highest income quartiles respectively.

**Figure 2**  
**Success Rates of Achieving a Combined 80% Real Replacement Rate From Social Security and 401(k) Accumulations, as a Function of Maximum Employee Contributions**



Source: VanDerhei and Lucas (2010).

**Figure 3**  
**Percentage of Successful\* Retirements for Automatic Enrollment 401(k) Plans,**  
**by Income Quartile and Real Replacement Rate Threshold**



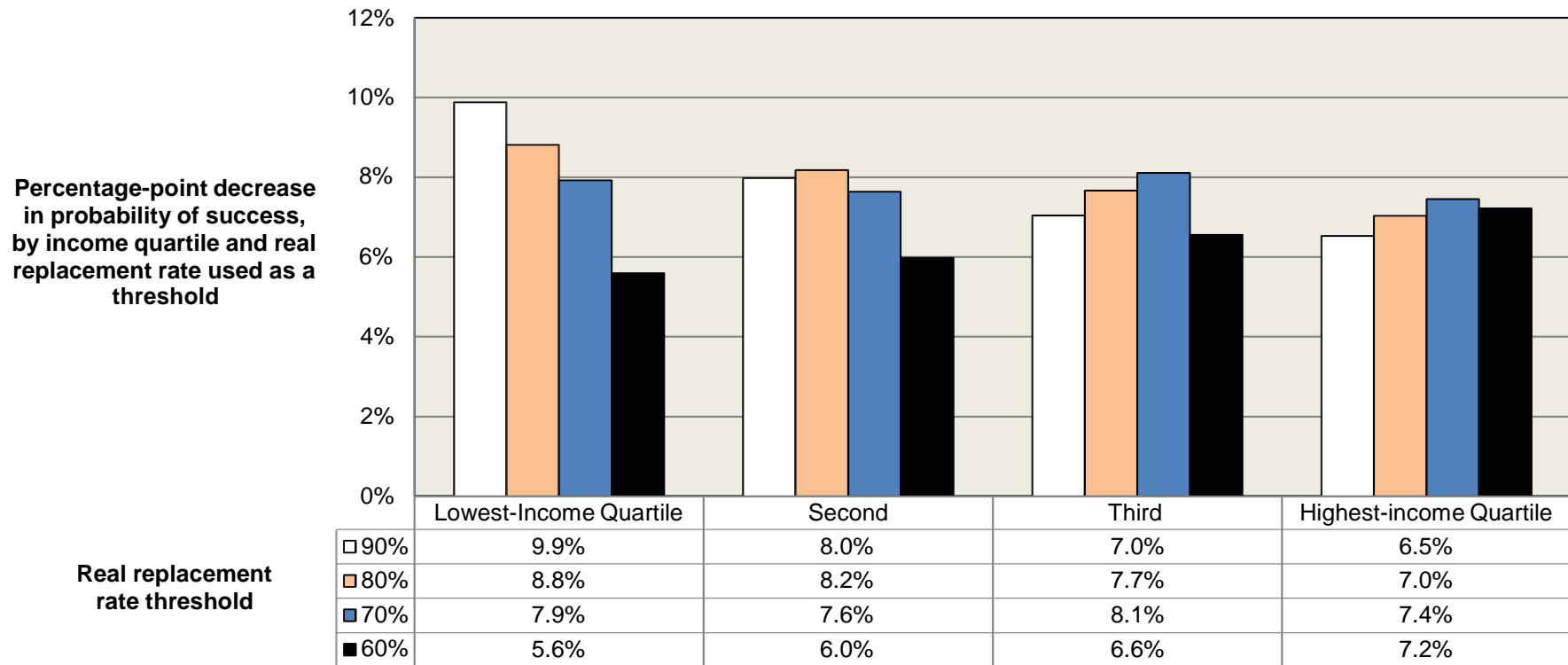
Source: EBRI Retirement Security Projection Model,® version 2107.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1percent of annual compensation increase and 3percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 4

**Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation**

Comparison scenarios: **No leakages vs all leakages** (cashouts, hardship withdrawals with 6-month suspension of contributions and loan defaults)



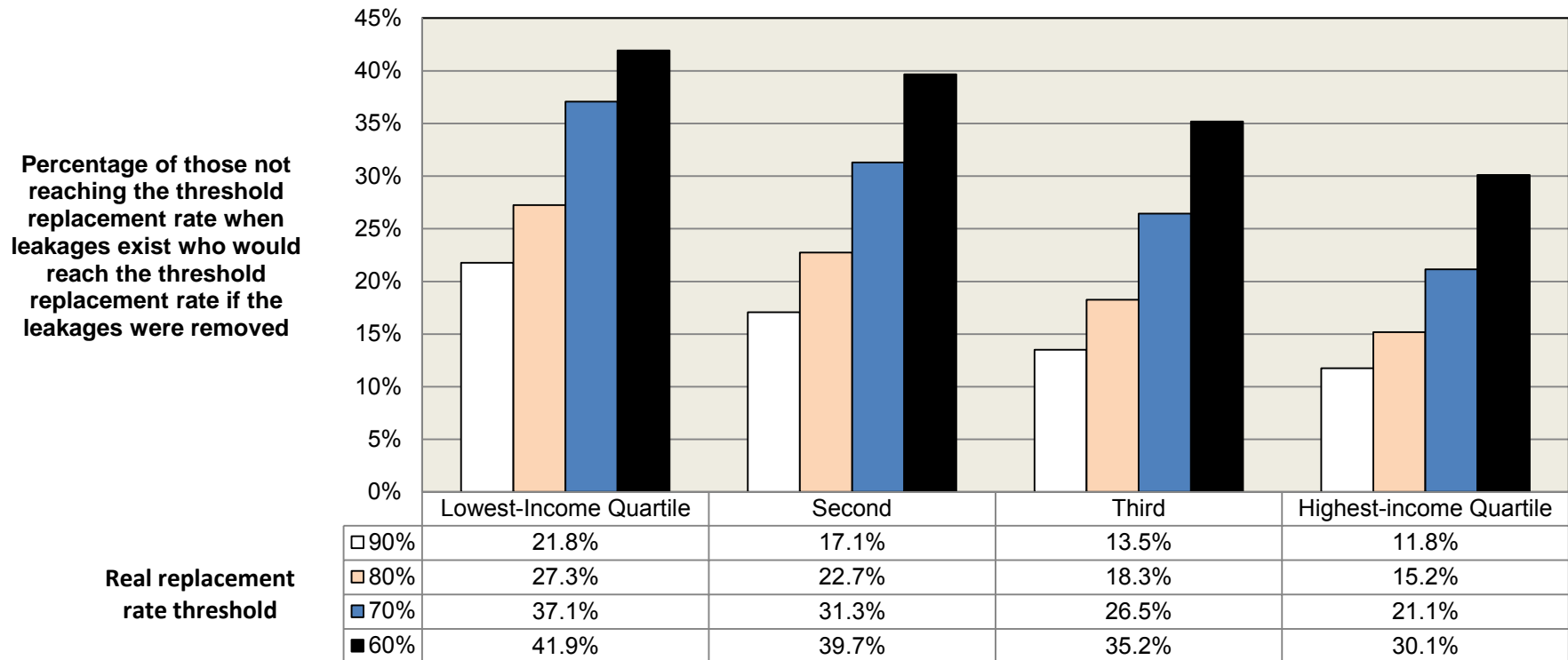
Source: EBRI Retirement Security Projection Model,® version 2107–2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 5

**Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation**

Comparison scenarios: **No leakages vs. all leakages** (cashouts, hardship withdrawals with 6-month suspension of contributions and loan defaults)



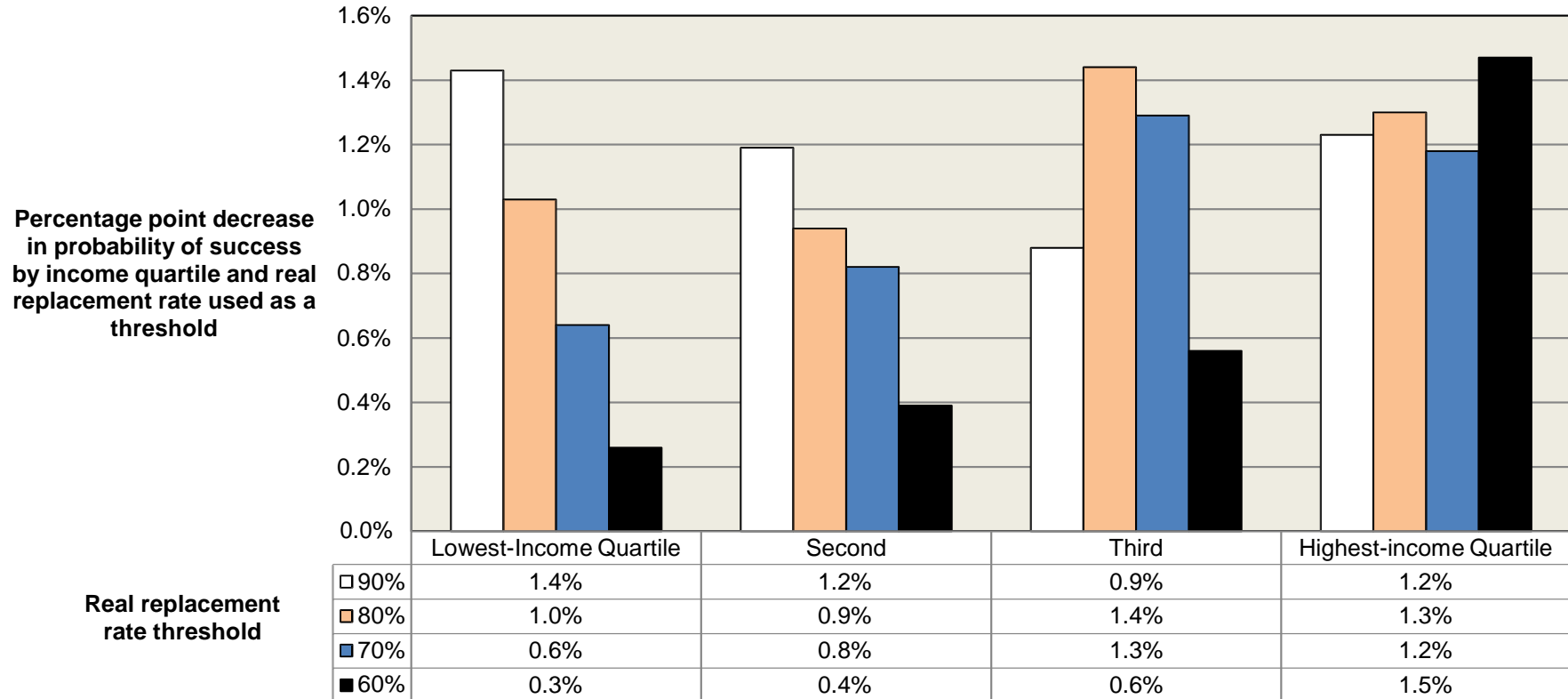
Source: EBRI Retirement Security Projection Model,® version 2107–2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 6

**Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation**

Comparison scenarios: **No leakages vs loan defaults**



Source: EBRI Retirement Security Projection Model,® version 2107–2115.

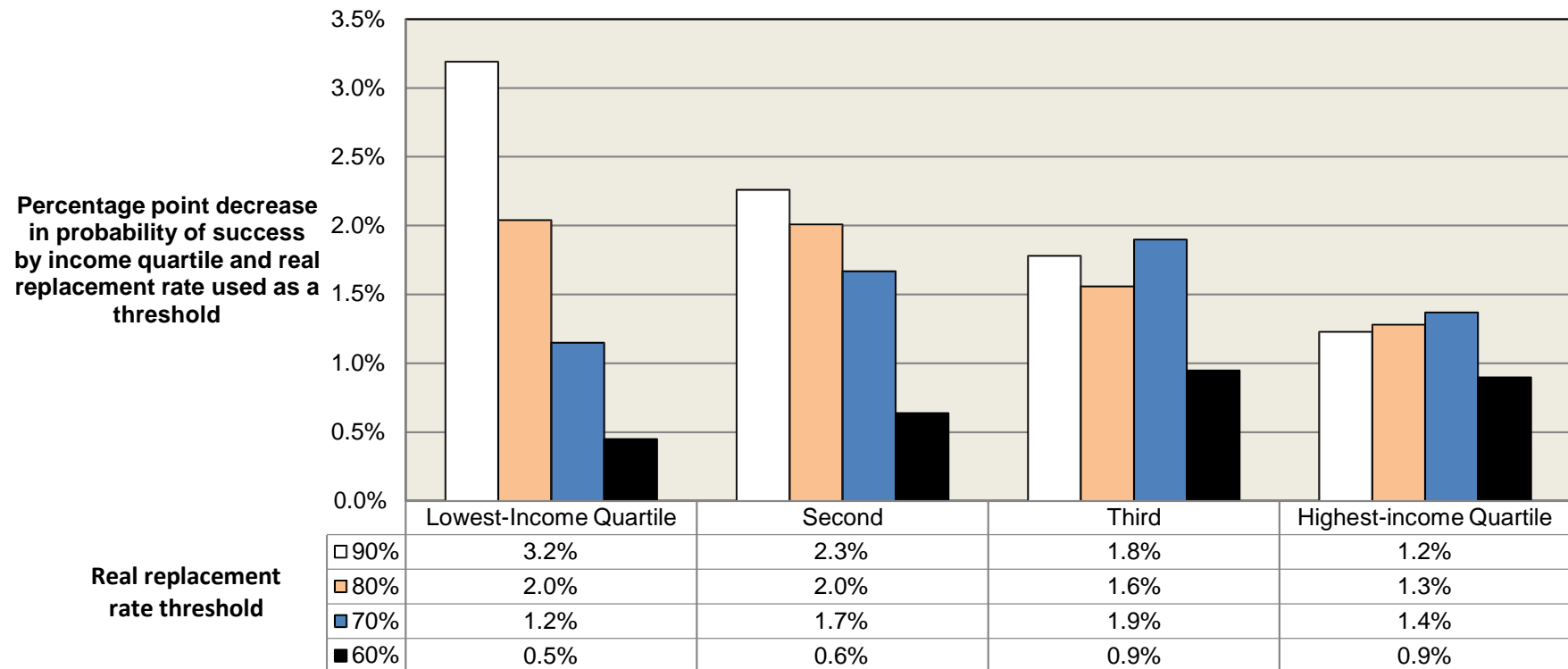
\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)



Figure 7

## Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation

Comparison scenarios: **No leakages vs. hardship withdrawals with 6-month suspension of contributions**



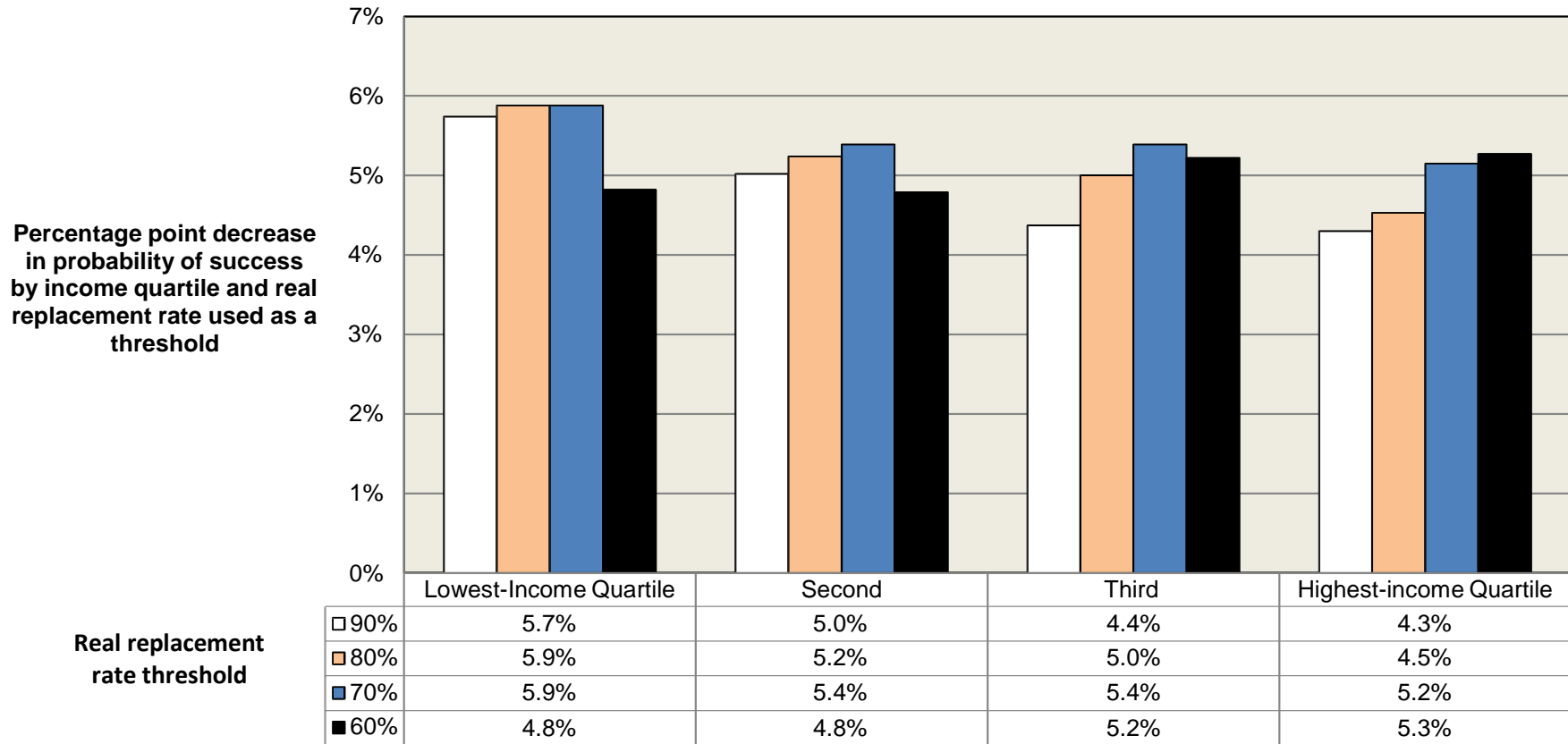
Source: EBRI Retirement Security Projection Model,® version 2107–2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 8

**Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation**

Comparison scenarios: **No leakages vs. cashouts at job change**



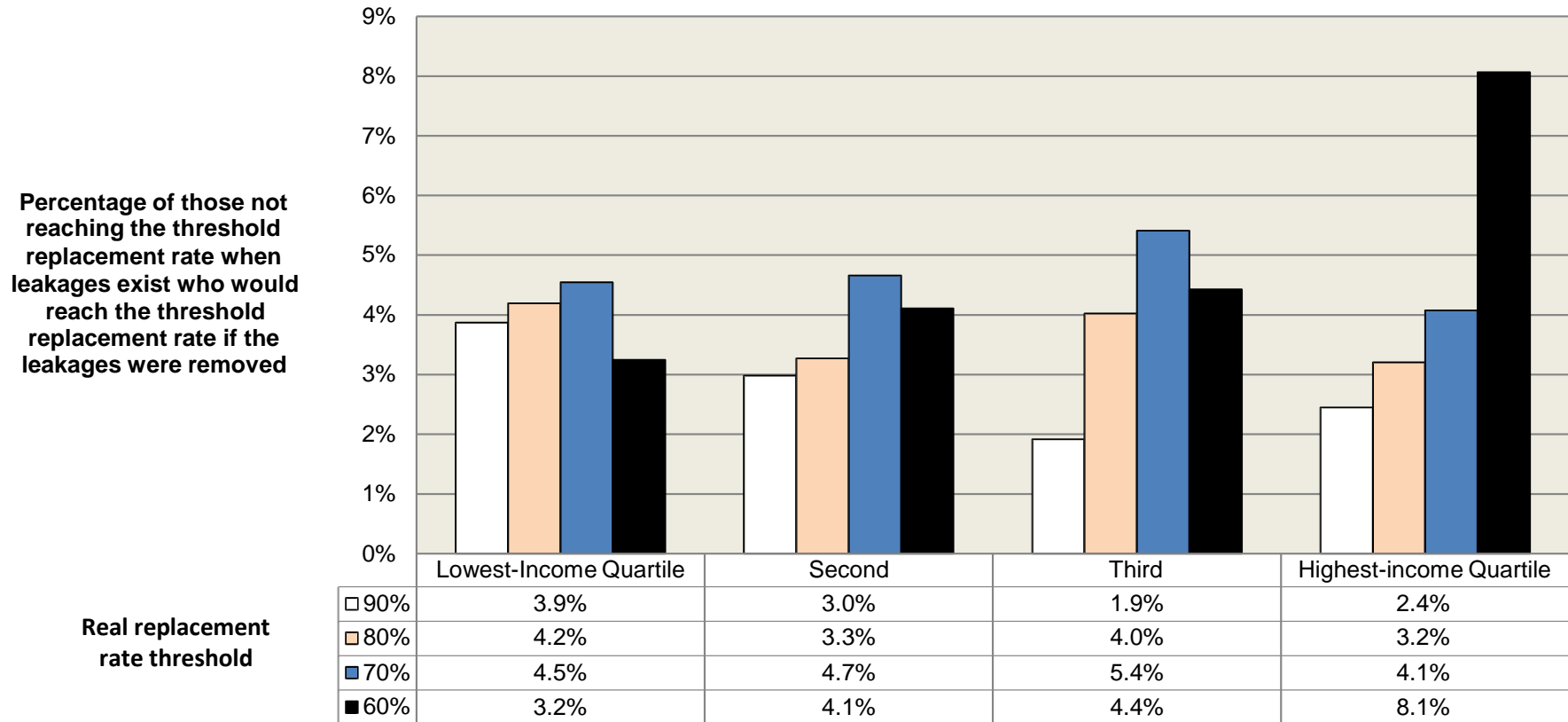
Source: EBRI Retirement Security Projection Model,® version 2107–2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 9

**Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation**

Comparison scenarios: **No leakages vs. loan defaults**



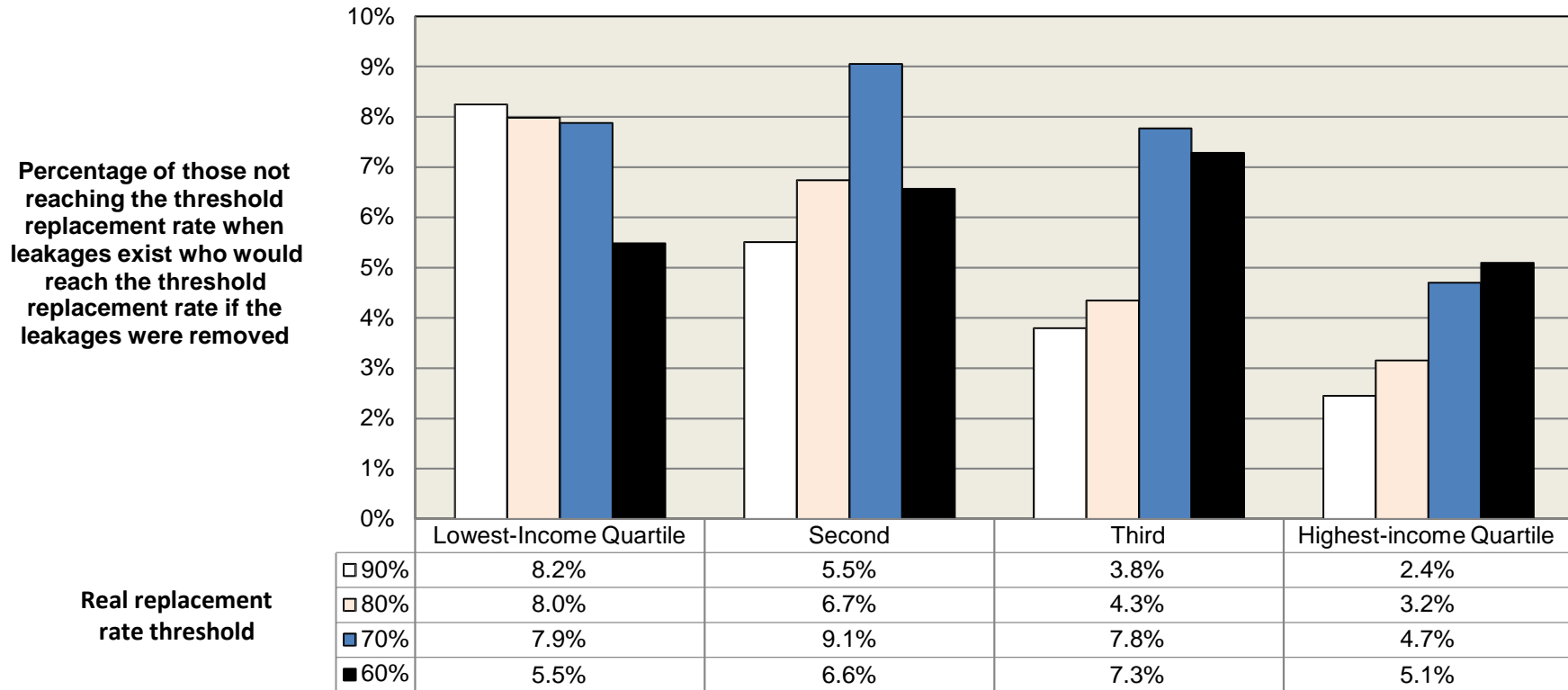
Source: EBRI Retirement Security Projection Model,<sup>®</sup> version 2107–2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 10

**Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation**

Comparison scenarios: **No leakages vs. hardship withdrawals with 6-month suspension of contributions**



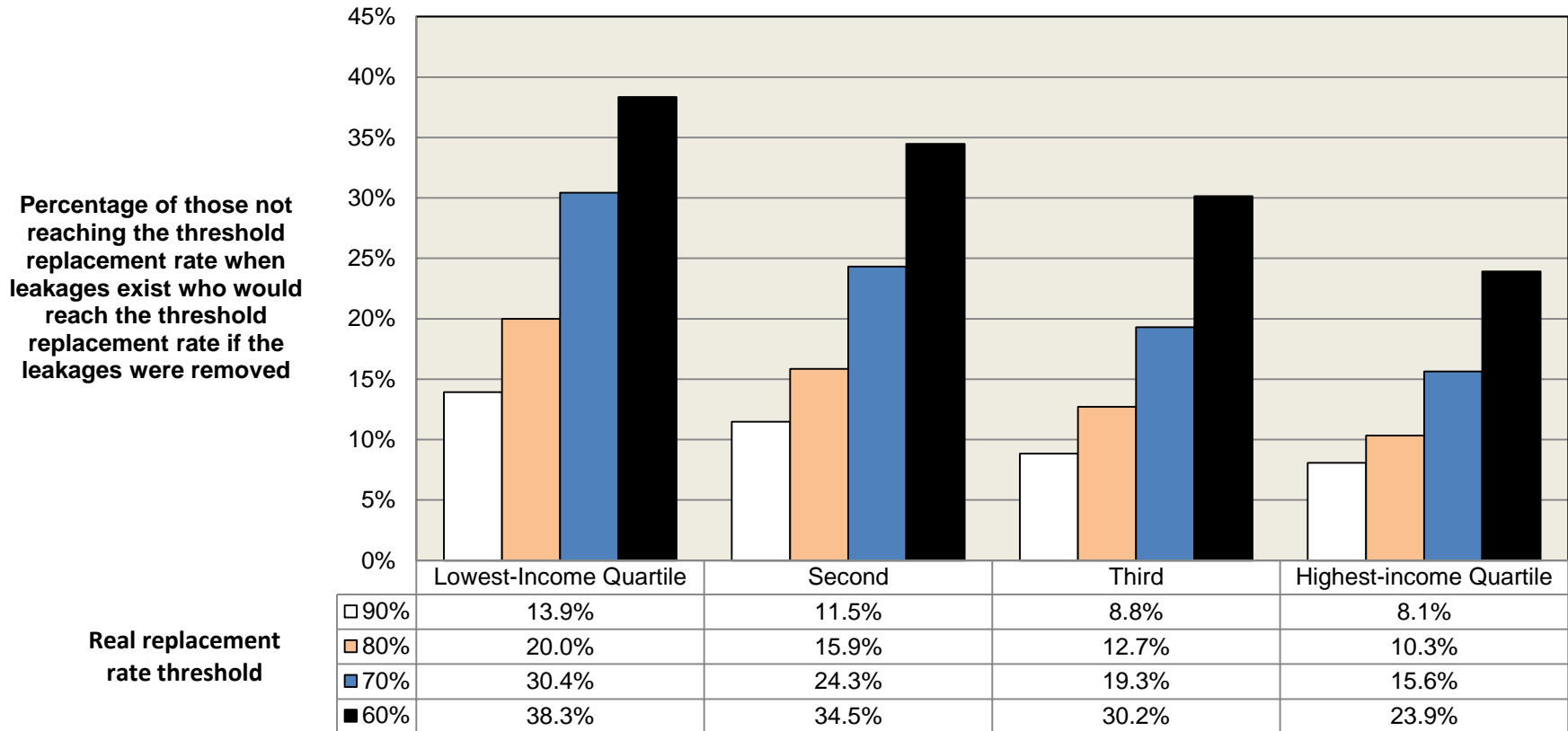
Source: EBRI Retirement Security Projection Model,® version 2107–2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)

Figure 11

## Impact of Leakages for Automatic Enrollment Plans Assuming No Participant Behavior Change for Participation, Contribution or Asset Allocation

Comparison scenarios: **No leakages vs cashouts at job change**



Source: EBRI Retirement Security Projection Model,® version 2107 - 2115.

\* "Success" is defined as achieving an X percent real replacement rate from Social Security and 401(k) accumulations combined as defined in VanDerhei and Lucas (2010) where X = 60, 70, 80 or 90. The population simulated consists of workers currently ages 25–29 who will have more than 30 years of simulated eligibility for participation in a 401(k) plan. Workers are assumed to retire at age 65 and all 401(k) balances are converted into a real annuity at an annuity purchase price of 18.62. Plans are assumed to have automatic escalation with a 1 percent of annual compensation increase and 3 percent default contribution rates. Employees are assumed to revert their level of contributions to the default rate when they participate in a new plan and opt-out of automatic escalation in accordance with the probabilities in VanDerhei (September 2007)