

Impact of the COVID-19 Pandemic on Retirement Income Adequacy: Evidence From EBRI's Retirement Security Projection Model[®]

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

AT A GLANCE

The research in this *EBRI Issue Brief* explores the aggregate potential impact of the 2020 market crisis as well as assumptions with respect to future employee and employer behavior in response to the current situation and potential decreases in defined contribution eligibility arising from increased unemployment. The combined impact of all intermediate assumptions (including the investment losses already experienced in the first quarter of 2020) certainly appears to be manageable: The \$3.68 trillion aggregate deficit for all U.S. households ages 35–64 as of January 1, 2020, only increased 4.5 percent or \$166.21 billion. Even the combination of pessimistic assumptions in this analysis only increased the aggregate retirement deficits by 11.2 percent or \$412.77 billion.

Of course, the crisis could result in unexpectedly worse outcomes — market losses could be even greater, plan terminations more common, etc. Further, this analysis is not meant to minimize the potential impact of the current situation on specific individuals who are most affected. A future *EBRI Issue Brief* will focus on the latter. Another *EBRI Issue Brief* will analyze the impact of the Coronavirus Aid, Relief, and Economic Security (CARES) Act on retirement income adequacy, factoring in the potential ability of affected workers to take much bigger loans and withdrawals than they could even during the 2007–2009 financial crisis.

Our analysis finds:

- Market volatility may be the largest factor during this crisis in increasing retirement savings shortfalls and decreasing savings surpluses, especially in a worst-case scenario.
- However, for the youngest workers, permanent termination of the defined contribution (DC) plans under \$10 million in assets could have a large impact.
- Match suspensions by plan sponsors, contribution suspensions by workers, increases in withdrawals, and decreased eligibility do not have as much impact when spread over all U.S. households. (However, they may have a significant influence on those impacted by these factors.)
- While employers and policymakers cannot control market fluctuations, they can be aware of the impact of plan sponsor and participant behavior on retirement income adequacy and develop approaches that can help mitigate damaging behavior today and position plans for robust utilization when the crisis ends.

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

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Impact of the COVID-19 Pandemic on Retirement Income Adequacy: Evidence From EBRI's Retirement Security Projection Model®

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Introduction

The current pandemic represents uncharted territory in many ways. One of them is the impact on the retirement income adequacy of American workers. We know market losses, layoffs, and suspension of defined contribution (DC) company matches are happening, and they will affect American workers' retirement income adequacy. However, it is difficult to gauge their extent and how workers might react in terms of their own reductions in DC plan contributions, hardship withdrawals, or plan loans. Nonetheless, it is tremendously important to understand the range of possible outcomes so that policymakers, plan sponsors, and providers can help workers best navigate this treacherous landscape.

Using its Retirement Security Projection Model® (RSPM), the Employee Benefit Research Institute (EBRI) examined three possible sets of assumptions for the current crisis:

- **Optimistic:** In this set of assumptions, market losses for the year are restricted to half of first quarter 2020 losses, reflecting a restrained economic impact of the pandemic with job losses being modest. This is associated with modest reductions in DC plan contributions by both the plan sponsor and participants as well as only modest increases in withdrawals, as described in greater detail below.
- **Intermediate:** In this set of assumptions, market losses for the year are equivalent to first quarter 2020 losses accompanied by a greater economic impact, accompanied by higher impacts on employers and DC participants, as described below.
- **Pessimistic:** In this set of assumptions, market losses are equivalent to those experienced in the 2007–2009 financial crisis. Economic impact is the most extreme in this set of assumptions, resulting in the highest impact on employers and DC participants, as described below.

Assumptions to support the various scenarios are largely derived from external surveys and other sources. The analysis is intended to provide a framework for understanding the potential impact of the market downturn and plan sponsor as well as participant behavior on retirement deficits (how much people may fall short of their retirement needs) and retirement surpluses (how much savings those who are not simulated to fall short of their retirement needs have at the end of their simulated life-path).

Related EBRI Research

EBRI conducted several studies of the impact of the financial and real estate market crisis of 2007–2009 on retirement income adequacy. In 2009,¹ we focused on the impact of the financial crisis on 401(k) account balances and calculated how long it might take for end-of-year 2008 401(k) balances to recover to their beginning-of-year 2008 levels. At a 5 percent equity rate-of-return assumption, it was estimated that those with the longest tenure with their current employer would need nearly two years at the median to recover but approximately five years at the 90th percentile. At a zero percent equity rate of return, this recovery time increased to approximately 2.5 years at the median and nine to 10 years at the 90th percentile.

In 2010,² we used the Retirement Security Projection Model® to update our analysis of retirement income adequacy for U.S. households between the ages of 35 and 64 and found that the percentage of the population "at risk" for inadequate retirement income decreased by more than 10 percentage points from 2003 to 2010. The key takeaway from this study was that the impact of the increasing prevalence of automatic enrollment after the Pension Protection Act of 2006 (PPA) more than made up for the impact of the financial and real estate market crises.³

In 2011,⁴ we performed a post-crisis assessment of retirement income adequacy for Baby Boomers and found that when looking at all Early Boomer households who 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.

EBRI plans to update these studies for the impact of the current market crisis as data becomes available. The current study uses our simulation model (described in the next section) to provide estimates of the likely impact of investment volatility, employer and employee behavior, and unemployment rates on retirement income adequacy using intermediate sets of assumptions as well as optimistic and pessimistic sets of assumptions.

EBRI's Retirement Security Projection Model[®]

EBRI's RSPM[®] simulates retirement income adequacy for all U.S. households between the ages of 35 and 64. The model reflects the real-world behavior of 27 million 401(k) participants as well as 20 million individuals with individual retirement accounts (IRAs).

RSPM[®] produces three important metrics for evaluating retirement income adequacy:

- Retirement savings shortfalls give the present value of the simulated retirement deficits at retirement age (in 2020 dollars).
- Retirement savings surpluses give the present value of simulated retirement surpluses at retirement age (in 2020 dollars).
- Net retirement savings surpluses give the present value of simulated retirement surpluses less retirement deficits at retirement age (in 2020 dollars).

EBRI Retirement Security Projection Model[®] Methodology

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

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

- Social Security.
- 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 some health insurance and out-of-pocket, health-related expenses, plus stochastic expenses from nursing-home and home-health care (at least until the point such expenses are covered by Medicaid). This version of the model is constructed to simulate retirement income adequacy, as noted above. Alternative versions of the model allow similar analysis for replacement rates, standard-of-living calculations, and other ad hoc thresholds.

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

Underlying Scenarios

Details on the underlying scenarios used for the simulations in this analysis are given on Figure 1. Each scenario consists of an intermediate set of assumptions as well as an optimistic and a pessimistic set of assumptions. Scenario A focuses on investment results only, while scenarios B through E incorporate the investment losses already experienced in the first quarter of 2020 in addition to an assumption with respect to plan sponsor and/or plan participant behavior for:

- Suspension of employer matches to 401(k) plans.
- Reduction of participant contributions for participants in plans where the 401(k) plan matches have been suspended.
- Termination of small 401(k) plans.
- Increase in withdrawal behavior of 401(k) participants.

Scenario F incorporates the investment losses already experienced in the first quarter of 2020 in addition to assumptions with respect to the impact of unemployment on eligibility for defined contribution plans.

Figure 1 Underlying Scenarios

- **Scenario A:** Assumes investment results only, with no behavioral modifications on the part of employees or plan sponsors for each of the following three sets of assumptions:
 - **Optimistic** is half of the 2020 first quarter decline
 - **Intermediate** equals the 2020 first quarter decline
 - **Pessimistic** equals the decline experienced in 2007–2009

- **Scenarios B–F:** These scenarios build on the Intermediate market set of assumptions as follows:

<u>Scenario:</u>	<u>Optimistic</u>	<u>Intermediate</u>	<u>Pessimistic</u>
B: 1 st quarter returns, and % of plan sponsors suspending match for a certain # of years	10% for 1 year	20% for 1 year	40% for 3 years
C: Scenario B and participants in plans with suspended matches also reducing contributions	10% for 1 year	20% for 1 year	40% for 3 years
D: 1 st quarter returns, and a certain percent of plans with <\$10 million in assets terminating	20%	40%	100%
E: 1 st quarter returns, and a one-time increase in withdrawals of a certain percentage	6.6%	13.2%	26.5%
F: 1 st quarter returns, and unemployment causing a 10% decrease in eligibility for a certain number of years	1 year	2 years	3 years

Impact of Investment Losses

The intermediate set of assumptions for Scenario A is based on the investment losses currently experienced in the first quarter of 2020. In other words, we assume the financial market conditions on April 1, 2020, remain constant through the end of 2020.⁵ For the pessimistic set of assumptions, we use the results experienced in the financial crisis of 2007–2009.⁶ The optimistic set of assumptions is simply chosen to be 50 percent of the investment losses experienced for the first quarter of 2020.

Figure 2 shows the impact of these three sets of assumptions on the retirement savings shortfalls (i.e., the present value of retirement deficits for those households simulated to run short of money in retirement). The current aggregate value of retirement savings shortfalls for all U.S. households from the ages of 35–64 was simulated to be \$3.68 trillion as of January 1, 2020. In the case of the intermediate set of assumptions, we find that the retirement deficits would increase 3.7 percent, or an additional \$136.43 billion. In the case of the optimistic set of assumptions, we find that the retirement deficits would increase 2.3 percent, or an additional \$84.98 billion. In the case of the pessimistic set of assumptions, we find that the retirement deficits would increase 9.0 percent, or an additional \$330.88 billion.

Figure 2
Increase in Aggregate Retirement Deficits From 1/1/20 Baseline of \$3.68 Trillion (in billions) Due to Market Volatility, All U.S. Households Ages 35–64, by Set of Assumptions

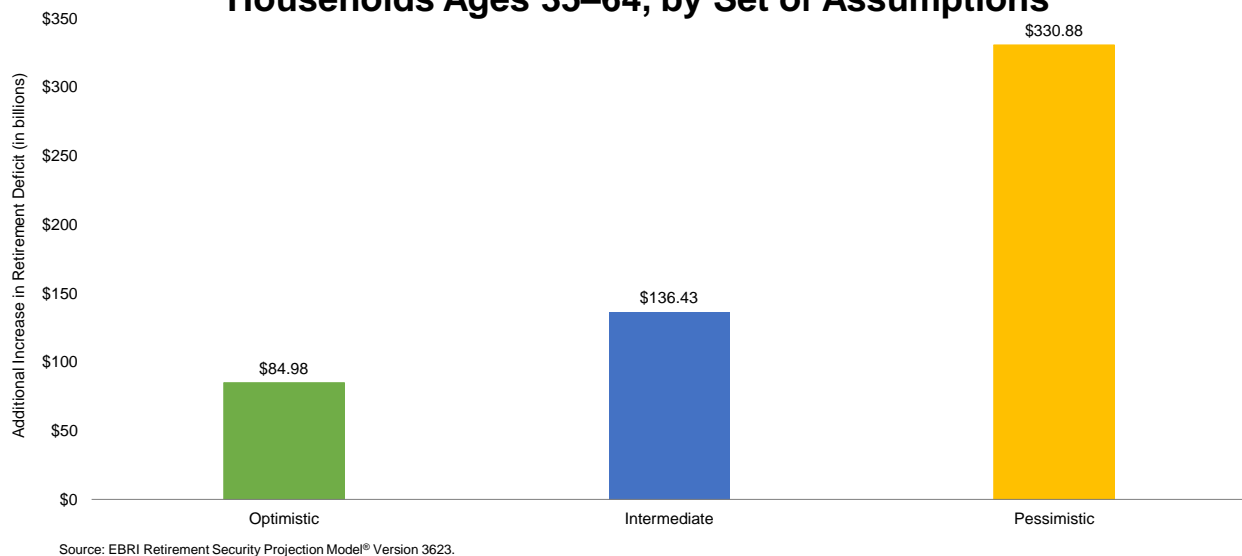


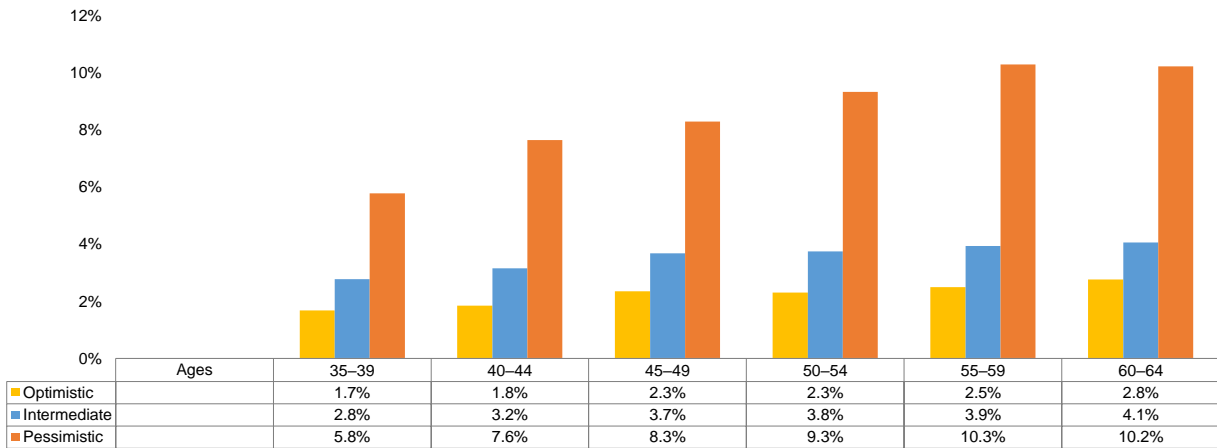
Figure 3 provides additional detail with respect to how the increase in retirement deficits varies by age. At the intermediate set of assumptions, the youngest cohort simulated (those currently ages 35–39) would experience an increase in retirement deficits of only 2.8 percent, whereas those in the oldest cohort (those currently ages 60–64) would have a 4.1 percent increase in retirement deficits. Even though the younger cohorts tend to invest more heavily in equities,⁷ the older cohort has much larger balances (both in absolute terms and as a percentage of their eventual balances at retirement). Moreover, a larger percentage of the “investment losses” suffered in the first quarter of 2020 for younger households would be lost prior to retirement age as a result of leakages.⁸

Figure 3 also shows a larger impact on the older cohort due to the first quarter 2020 investment losses in both the optimistic and pessimistic sets of assumptions. In the case of the optimistic set of assumptions, the youngest cohort is simulated to experience only a 1.7 percent increase in retirement deficits compared with 2.8 percent for the oldest cohort. In the case of the pessimistic set of assumptions, the youngest cohort is simulated to experience only a 5.8 percent increase in retirement deficits compared with 10.2 percent for the oldest cohort.

While the increase in shortfalls under the intermediate set of assumptions in Figure 3 may appear small compared with the overall reduction in the equity market in the first quarter of 2020, it is important to remember that these percentages are an aggregate over all U.S. households — even those not working for employers that sponsor a retirement plan.

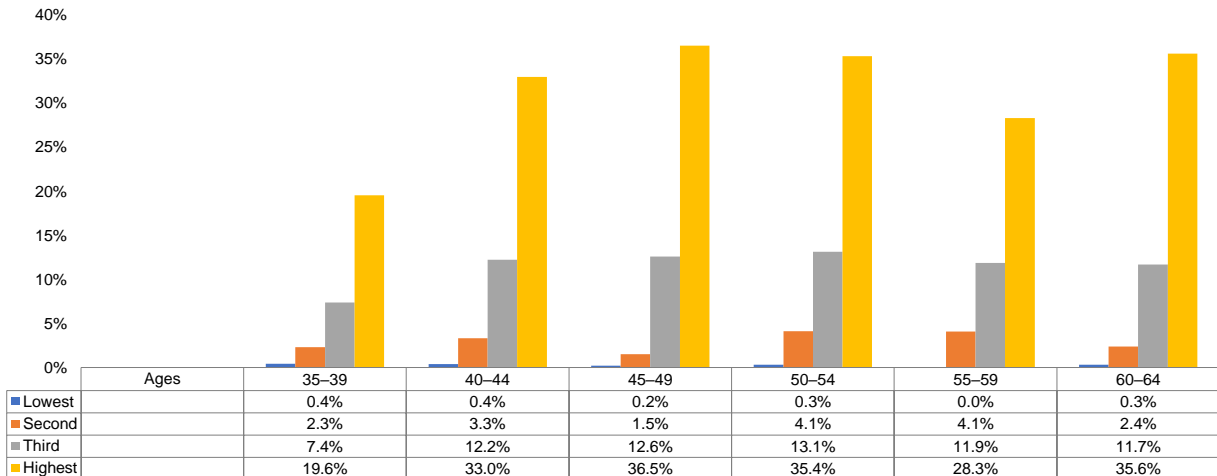
In an attempt to at least partially control for this, Figure 4 looks at the impact of the first quarter 2020 investment losses on retirement deficits as a function of both age and age-specific account balances for defined contribution plans and IRAs combined. For those in the lowest quartile of age-specific account balances, we see that the impact of first quarter 2020 investment losses are de minimis: no more than 0.4 percent regardless of age. The oldest cohort of households in the lowest quartile of age-specific account balances experiences only a 0.3 percent increase in retirement deficits, while those in the second quartile are simulated to have a 2.4 percent increase. In contrast, the oldest cohort in the third quartile is expected to have an 11.7 percent increase in retirement deficits, while those in the highest quartile are simulated to have a 35.6 percent increase.

Figure 3
Scenario A: Increase in Shortfalls Under Various Investment Sets of Assumptions



Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario A: Investment results only, no behavioral modification on the part of employees or sponsors. Optimistic is half of the 2020 first quarter decline. Intermediate equals the 2020 first quarter decline. Pessimistic equals the decline experienced in 2007-2009.

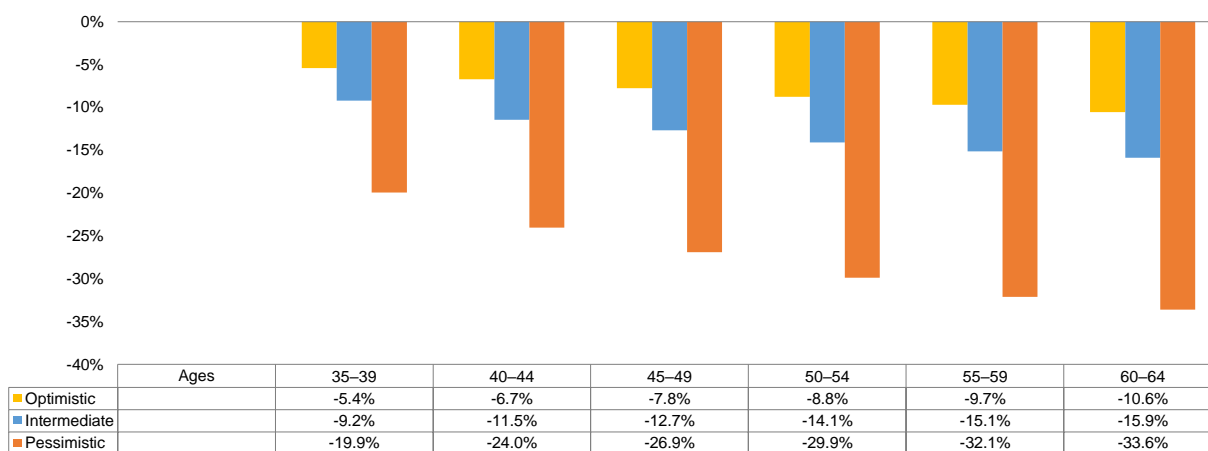
Figure 4
Impact of 1st Quarter Market Volatility on Retirement Savings Shortfalls, by Age-Specific Quartile of Defined Contribution + IRA Balances



Source: EBRI Retirement Security Projection Model® Version 3623. Note: 20Q1 investment results only, no behavioral modification on the part of employees or sponsors.

Although the analysis of retirement deficits in figures 3 and 4 is extremely important for public policy purposes, it represents only approximately 40 percent of households: those who were already expected to fall short of their retirement needs.⁹ The impact of the first quarter 2020 investment losses on the other approximately 60 percent of the households (viz., those NOT simulated to run short of money in retirement) can be seen in Figure 5. In the intermediate set of assumptions, the youngest cohort simulated (those currently ages 35–39) would experience a decrease in retirement savings surpluses (the present value of retirement surpluses) of only 9.2 percent, whereas those in the oldest cohort (those currently ages 60–64) would have a 15.9 percent decrease in retirement surpluses. Figure 5 also shows a larger impact of the first quarter 2020 investment losses on the older cohort for both of the other two sets of assumptions. In the case of the optimistic set of assumptions, the youngest cohort is simulated to experience only a 5.4 percent decrease in retirement surpluses compared with 10.6 percent for the oldest cohort. In the case of the pessimistic set of assumptions, the youngest cohort is simulated to experience a 19.9 percent decrease in retirement surpluses compared with 33.6 percent for the oldest cohort.

Figure 5
Scenario A: Decrease in Surpluses Under Various Investment Sets of Assumptions

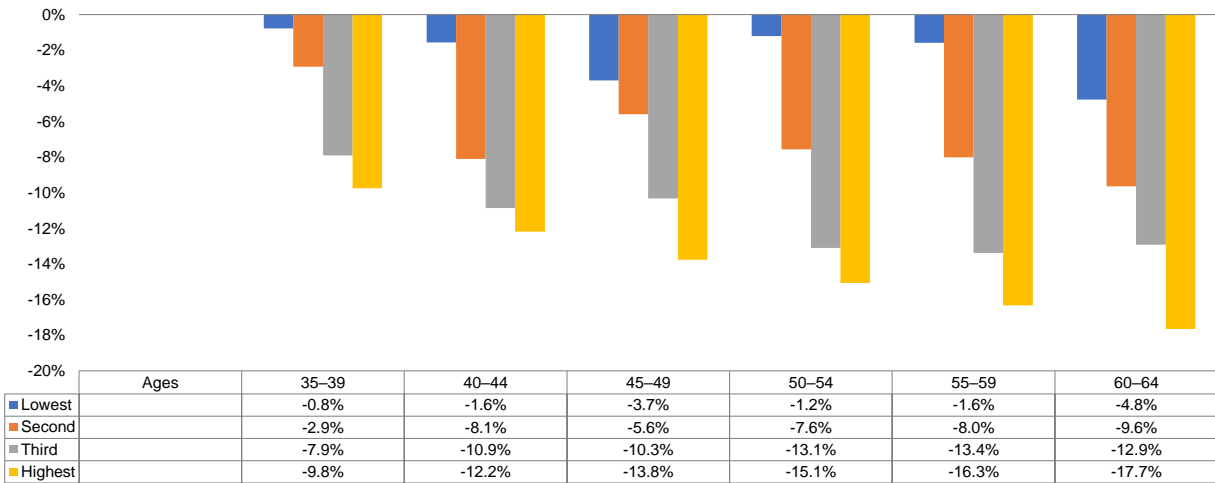


Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario A: Investment results only, no behavioral modification on the part of employees or sponsors. Optimistic is half of the 2020 first quarter decline. Intermediate equals the 2020 first quarter decline. Pessimistic equals the decline experienced in 2007–2009.

Controlling for those with account balances, Figure 6 looks at the impact of the first quarter 2020 investment losses on retirement surpluses as a function of both age and age-specific account balances for defined contribution plans and IRAs combined. The oldest cohort of households in the lowest quartile of age-specific account balances experiences only a 4.8 percent decrease in retirement surpluses, while those in the second quartile are simulated to have a 9.6 percent decrease. The oldest cohort in the third quartile is expected to have a 12.9 percent decrease in retirement surpluses, while those in the highest quartile are simulated to have a 17.7 percent decrease.

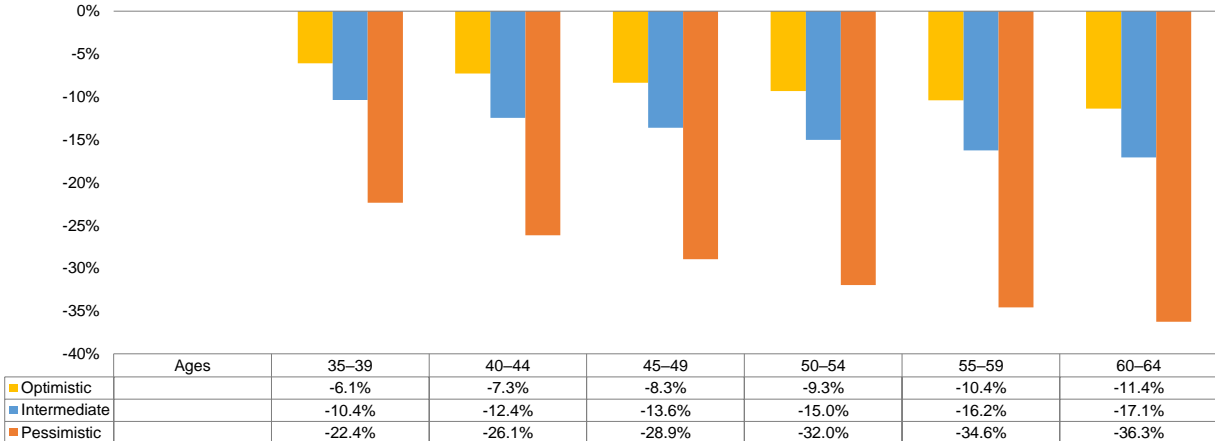
If one is interested primarily in the combined effect of first quarter 2020 investment losses on all U.S. households, the simulated impact can be seen in Figure 7. In the intermediate set of assumptions, the youngest cohort simulated (those currently ages 35–39) would experience a decrease in retirement savings net surpluses (the present value of retirement surpluses minus the present value of retirement shortfalls) of 10.4 percent, whereas those in the oldest cohort (those currently ages 60–64) would have a 17.1 percent decrease in retirement net surpluses. Figure 7 also shows a larger impact of the first quarter 2020 investment losses on the older cohort for both of the other two sets of assumptions. In the case of the optimistic set of assumptions, the youngest cohort is simulated to experience only a 6.1 percent decrease in retirement net surpluses compared with 11.4 percent for the oldest cohort. In the case of the pessimistic set of assumptions, the youngest cohort is simulated to experience a 22.4 percent decrease in retirement net surpluses compared with 36.3 percent for the oldest cohort.

Figure 6
**Impact of 1st Quarter Market Volatility on Retirement Savings Surpluses,
 by Age-Specific Quartile of Defined Contribution + IRA Balances**



Source: EBRI Retirement Security Projection Model® Version 3623. Note: 20Q1 investment results only, no behavioral modification on the part of employees or sponsors.

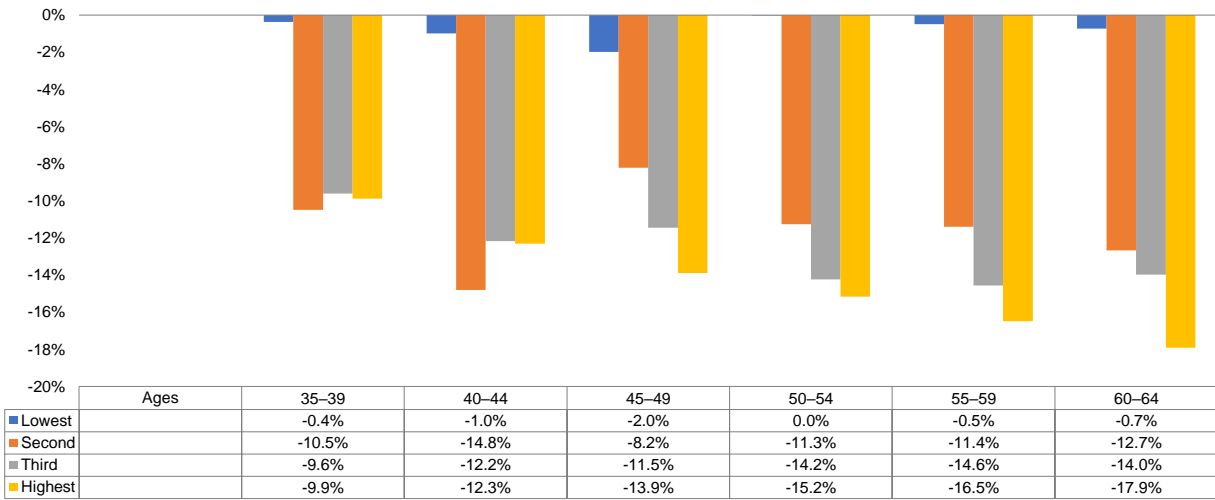
Figure 7
**Scenario A: Decrease in Net Surpluses
 Under Various Investment Sets of Assumptions**



Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario A: Investment results only, no behavioral modification on the part of employees or sponsors. Optimistic is half of the 2020 first quarter decline. Intermediate equals the 2020 first quarter decline. Pessimistic equals the decline experienced in 2007-2009.

Focusing again on those with account balances, Figure 8 looks at the impact of the first quarter 2020 investment losses on retirement net surpluses as a function of both age and age-specific account balances for defined contribution plans and IRAs combined. The oldest cohort of households in the lowest quartile of age-specific account balances experiences only a 0.7 percent decrease in retirement surpluses, while those in the second quartile are simulated to have a 12.7 percent decrease. The oldest cohort in the third quartile is expected to have a 14.0 percent decrease in retirement surpluses, while those in the highest quartile are simulated to have a 17.9 percent decrease.

Figure 8 Impact of 1st Quarter Market Volatility on Retirement Savings Net Surpluses, by Age-Specific Quartile of Defined Contribution + IRA Balances



Source: EBRI Retirement Security Projection Model[®] Version 3623. Note: 20Q1 investment results only, no behavioral modification on the part of employees or sponsors.

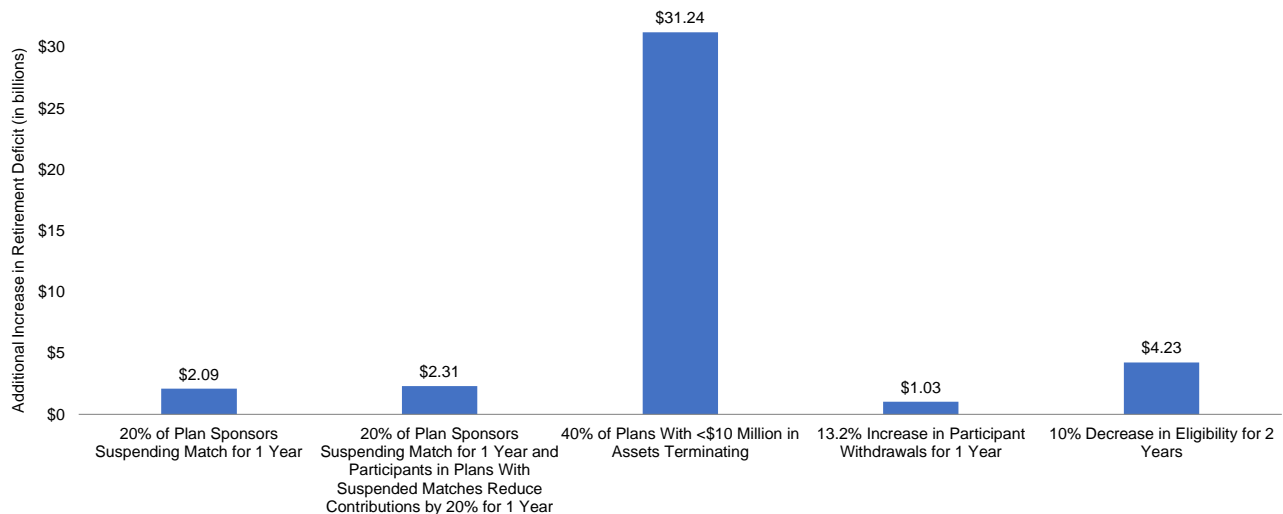
Impact of Plan Sponsors Suspending Employer Matches to 401(k) Plans

Scenario B focuses on the impact of the first quarter 2020 investment losses plus the assumption that a percentage of 401(k) plan sponsors will suspend employer matches to their plans for a number of years. The intermediate set of assumptions in this case is based on a Towers Watson survey of employer reactions to the last financial crisis.¹⁰ We assume that 20 percent of 401(k) plan sponsors will suspend their matches for a single year. The optimistic set of assumptions is that only 10 percent of 401(k) plan sponsors will suspend their matches for a single year, and the pessimistic set of assumptions is that 40 percent of 401(k) plan sponsors will suspend their matches for three years.

Figure 9 shows that the intermediate set of assumptions for this scenario would increase the aggregate retirement deficits by \$2.09 billion. The impact of the pessimistic set of assumptions is shown in Figure 10 and would result in a \$11.29 billion increase, while the impact of the optimistic set of assumptions is shown in Figure 11 and would only be \$1.05 billion.

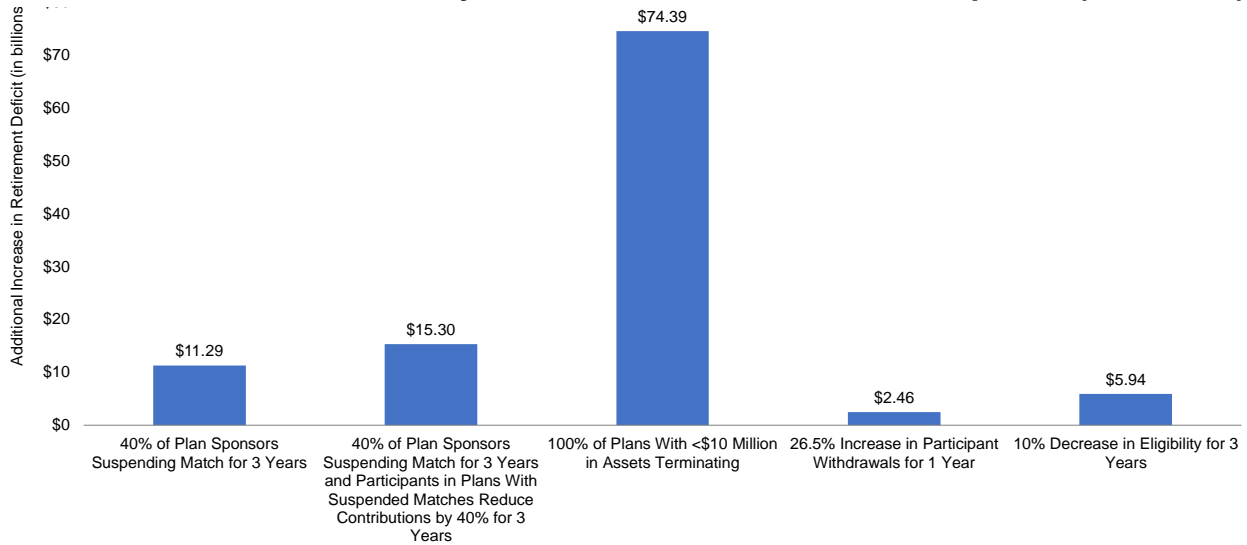
The age-specific impact of this scenario on retirement savings shortfalls, retirement savings surpluses, and retirement savings net surpluses can be found in the appendix (figures 16–18).

Figure 9 Increase in Retirement Deficits Above the \$136 Billion Experienced From 1st Quarter 2020 Market Volatility: *Intermediate* Case Set of Assumptions (in billions)



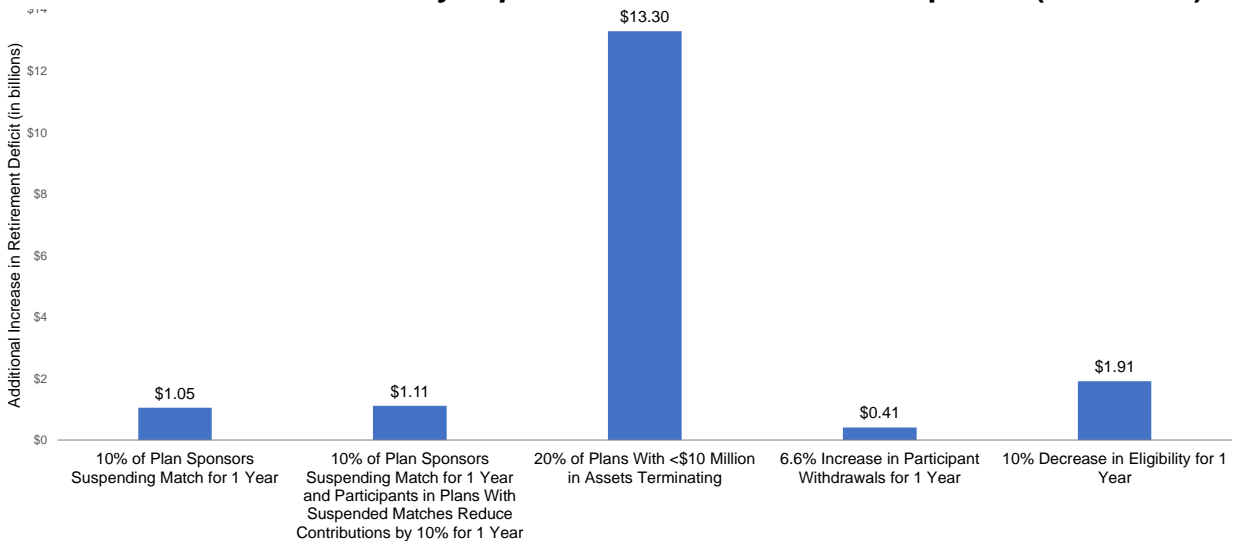
Source: EBRI Retirement Security Projection Model[®] Version 3623.

Figure 10
Increase in Retirement Deficits Above the \$136 Billion Experienced From 1st Quarter 2020 Market Volatility: *Pessimistic* Case Set of Assumptions (in billions)



Source: EBRI Retirement Security Projection Model® Version 3623.

Figure 11
Increase in Retirement Deficits Above the \$136 Billion Experienced From 1st Quarter 2020 Market Volatility: *Optimistic* Case Set of Assumptions (in billions)



Source: EBRI Retirement Security Projection Model® Version 3623.

Impact of Plan Sponsors Suspending Employer Matches to 401(k) Plans Combined With Participants in Those Plans Reducing Employee Contributions

Scenario C adds the potential impact of reduced employee contributions but only for those participants in plans where the sponsor has temporarily suspended matching contributions. The intermediate set of assumptions is based on analysis performed in the last financial crisis and is assumed to translate into a 20 percent reduction in employee contributions for a one-year period only.¹¹ The optimistic set of assumptions is that there will only be a 10 percent reduction for these participants for a single year, and the pessimistic set of assumptions is that there will be a 40 percent reduction for three years.

Figure 9 shows that the intermediate set of assumptions for this scenario would increase the aggregate retirement deficits by \$2.31 billion (or an increase of \$0.22 billion over the \$2.09 billion increase from the impact of the suspension of employer matches alone). The impact of the pessimistic set of assumptions is shown in Figure 10 and would result in a \$15.30 billion increase, while the impact of the optimistic set of assumptions is shown in Figure 11 and would only be \$1.11 billion.

The age-specific impact of this assumption on retirement savings shortfalls, retirement savings surpluses, and retirement savings net surpluses can be found in the appendix (figures 19–21).

Impact of Small Plan Terminations

Scenario D simulates the impact of first quarter 2020 investment losses as well the potential for terminations of small 401(k) plans to modify retirement income adequacy. The intermediate scenario is based on analysis from an American Retirement Association survey, and we assume that 40 percent of plans with assets of less than \$10 million will terminate.¹² The optimistic set of assumptions is that only 20 percent will terminate, and the pessimistic scenario is that all plans with asset levels under that threshold will terminate.

Figure 9 shows that the intermediate set of assumptions for this scenario would increase the aggregate retirement deficits by \$31.24 billion. The impact of the pessimistic set of assumptions is shown in Figure 10 and would result in a \$74.39 billion increase, while the impact of the optimistic set of assumptions is shown in Figure 11 and would be \$13.30 billion.

The age-specific impact of this scenario on retirement savings shortfalls, retirement savings surpluses, and retirement savings net surpluses can be found in the appendix (figures 22–24).

Impact of a One-Time Increase in Withdrawals

Scenario E simulates the impact of first quarter 2020 investment losses as well as a one-time increase in withdrawals for 401(k) participants. The intermediate set of assumptions is based on analysis from an Investment Company Institute time series, and we assume that there will be a one-time increase in the individual withdrawal probabilities of 13.2 percent.¹³ The optimistic set of assumptions is that the one-time increase will be half of that amount (6.6 percent), and the pessimistic set of assumptions is that the one-time increase will be twice that amount (26.5 percent).

Figure 9 shows that the intermediate set of assumptions for this scenario would increase the aggregate retirement deficits by \$1.03 billion. The impact of the pessimistic set of assumptions is shown in Figure 10 and would result in a \$2.46 billion increase, while the impact of the optimistic set of assumptions is shown in Figure 11 and would be \$0.41 billion.

The age-specific impact of this scenario on retirement savings shortfalls, retirement savings surpluses, and retirement savings net surpluses can be found in the appendix (figures 25–27).

Impact of a Decrease in Defined Contribution Eligibility as a Result of Unemployment

Scenario F simulates the impact of the first quarter 2020 investment losses as well as a decrease in defined contribution eligibility arising from an increase in unemployment. Although the official unemployment rate for April 2020 is not currently available, given the massive increase in the number of people filing for unemployment insurance in the last three weeks, it appears that there is approximately a 10 percentage point increase in the unemployment rate compared with the beginning of 2020. The intermediate set of assumptions is that there will be a decrease in the eligibility rates for defined contribution plans of 10 percent for the next two years. The optimistic set of assumptions is that this decrease will only last one year, and the pessimistic set of assumptions is that it will last three years.

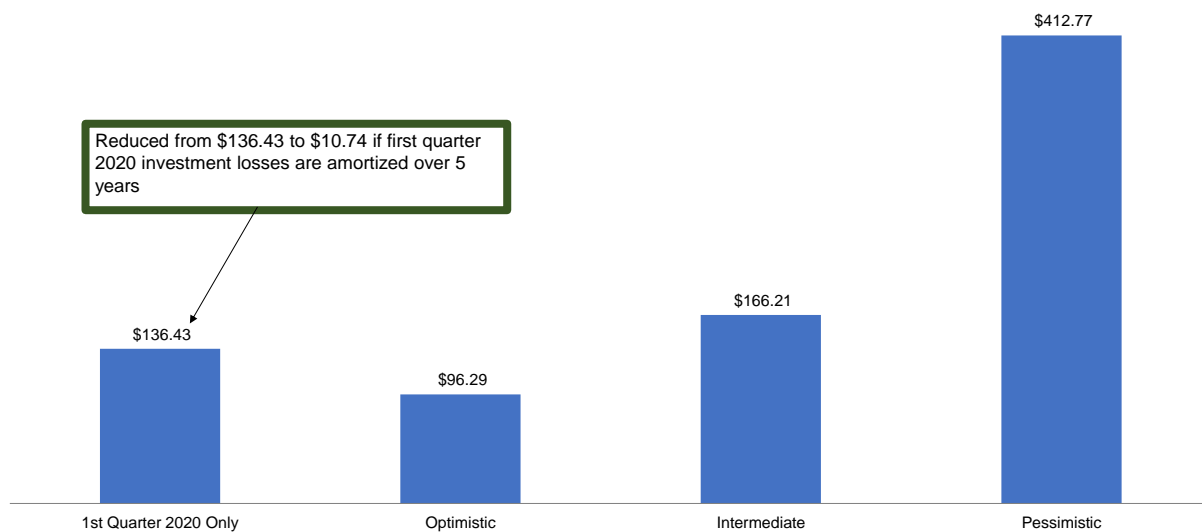
Figure 9 shows that the intermediate set of assumptions for this scenario would increase the aggregate retirement deficits by \$4.23 billion. The impact of the pessimistic set of assumptions is shown in Figure 10 and would result in a \$5.94 billion increase, while the impact of the optimistic set of assumptions is shown in Figure 11 and would be \$1.91 billion.

The age-specific impact of this scenario on retirement savings shortfalls, retirement savings surpluses, and retirement savings net surpluses can be found in the appendix (figures 28–30).

Aggregate Impact of All Scenarios: Optimistic, Intermediate, and Pessimistic

Figure 12 shows the aggregate impact of all the scenarios mentioned above when combined with the investment losses already experienced in the first quarter of 2020. As mentioned earlier, the aggregate retirement deficits for all U.S. households ages 35–64 (\$3.68 trillion) would be increased by 3.7 percent or \$136.43 billion based on these investment losses alone.¹⁴ However, if the impact of each of the intermediate sets of assumptions for scenarios B through F were added to these investment losses, the aggregate retirement deficits would increase by 4.5 percent or \$166.21 billion. In contrast, if all of the optimistic assumptions were used (including the assumption that the investment losses for 2020 are only half of what was experienced in the first quarter of the year), the aggregate retirement deficit would increase by 2.6 percent or \$96.29 billion. However, if all of the pessimistic assumptions were realized (including investment losses at the same rate as that experienced during the previous crisis), the aggregate deficits would increase by 11.2 percent or \$412.77 billion.

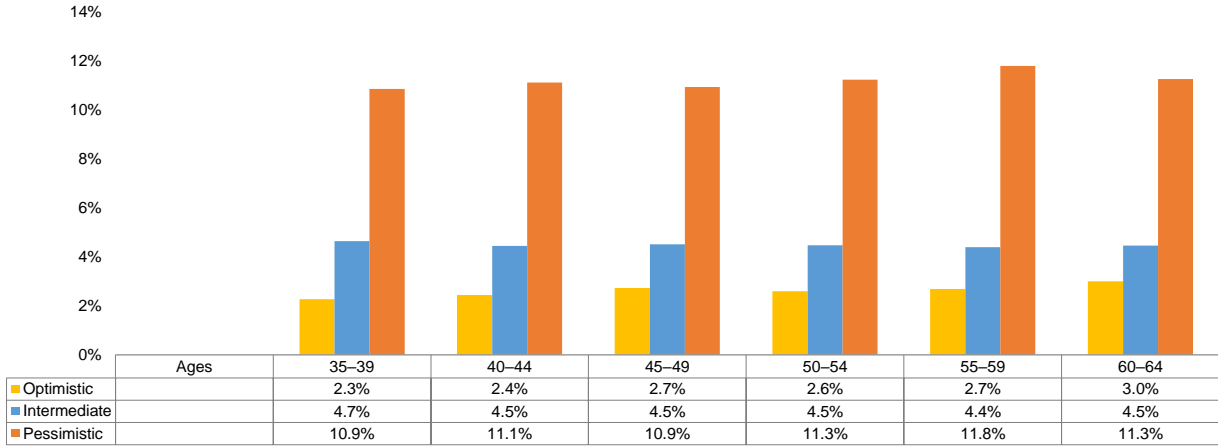
Figure 12
**Increase in Aggregate Retirement Deficits From 1/1/20 Baseline of \$3.68 Trillion
 (in billions) All U.S. Households Ages 35–64, by Set of Assumptions**



Source: EBRI Retirement Security Projection Model® Version 3623.

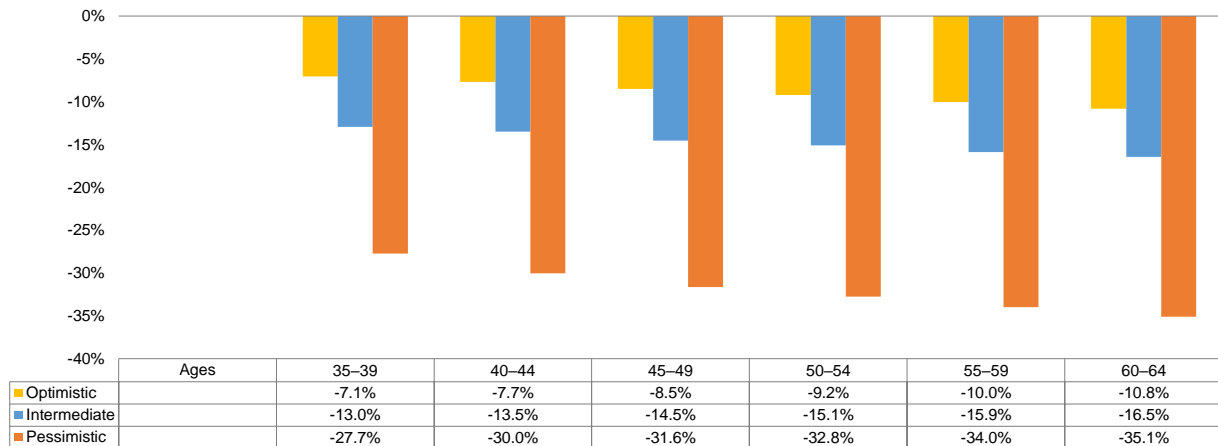
Figure 13 shows the aggregate increase in retirement deficits by age. At the intermediate set of assumptions, the impact appears to be age invariant with the larger impact of investment losses for older cohorts being offset by the larger impact of small plan terminations for the younger cohorts. Figure 14 shows the aggregate decrease in retirement surpluses by age. When we focus on the portion of the U.S. households simulated to NOT run short of money in retirement, we see there is a larger impact on the older cohorts (for all three of the assumption vectors). Finally, Figure 15 shows the aggregate decrease in retirement net surpluses by age. Again, the impact of all three sets of assumptions is larger for older cohorts.

Figure 13
Aggregate Increase in Shortfalls, by Set of Assumptions



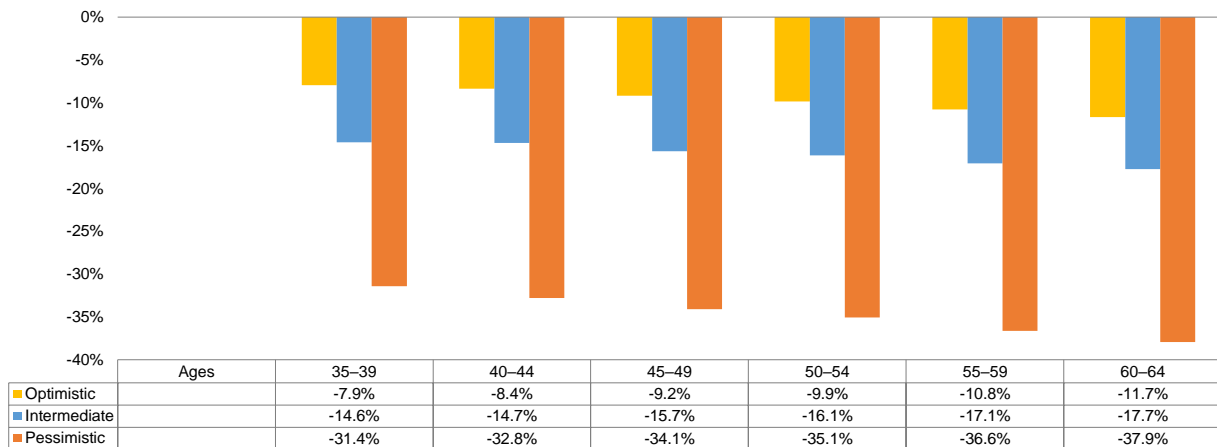
Source: EBRI Retirement Security Projection Model® Version 3623. Note: All scenarios combined: Pessimistic, Intermediate, Optimistic.

Figure 14
Aggregate Decrease in Surpluses, by Set of Assumptions



Source: EBRI Retirement Security Projection Model® Version 3623. Note: All scenarios combined: Pessimistic, Intermediate, Optimistic.

Figure 15
Aggregate Decrease in Net Surpluses, by Set of Assumptions



Source: EBRI Retirement Security Projection Model® Version 3623. Note: All scenarios combined: Pessimistic, Intermediate, Optimistic.

Conclusion

The research in this *EBRI Issue Brief* explored the aggregate impact of the 2020 market crisis as well as assumptions with respect to future employee and employer behavior in response to the current situation and potential decreases in defined contribution eligibility arising from increased unemployment. The combined impact of all intermediate assumptions (including the investment losses already experienced in the first quarter of 2020) certainly appears to be manageable: The \$3.68 trillion aggregate deficit for all U.S. households ages 35–64 only increased 4.5 percent or \$166.21 billion. Even the combination of pessimistic sets of assumptions in this analysis only increased the aggregated retirement deficits by 11.2 percent or \$412.77 billion.

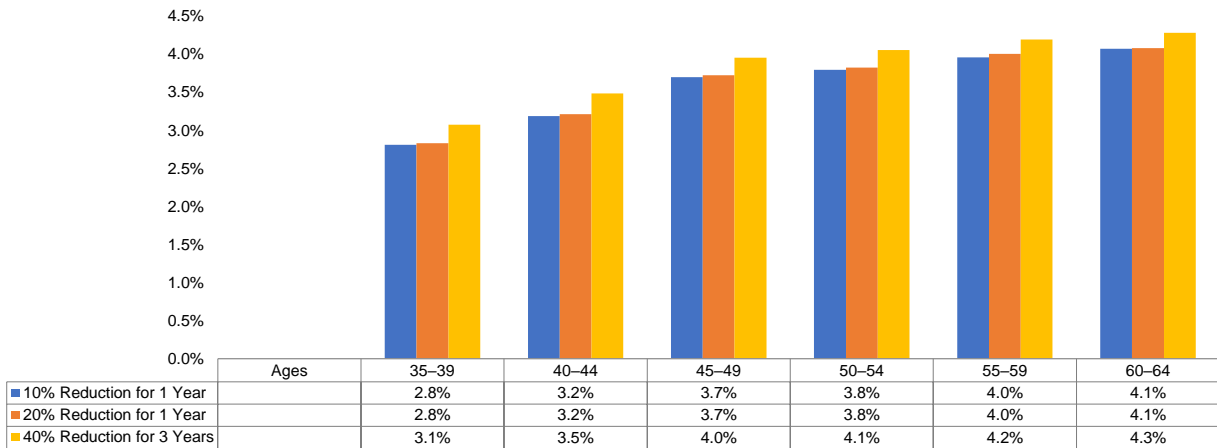
Market volatility is clearly the largest factor driving decreases in retirement income adequacy, especially in a worst-case scenario. In contrast, match suspensions by plan sponsors, contribution suspensions by workers, increases in withdrawals, and decreased eligibility do not have as much impact when spread over all U.S. households. Of course, that is not to say they may not have a very significant influence on those impacted by these factors.

While employers and policymakers cannot control market fluctuations, they can be aware of the impact of plan sponsor and participant behavior on retirement income adequacy and develop approaches that can help mitigate damaging behavior today and position plans for robust utilization when the crisis ends.

A future *EBRI Issue Brief* will analyze the impact of the Coronavirus Aid, Relief, and Economic Security (CARES) Act on retirement income adequacy, factoring in the ability of affected workers to take much bigger loans and withdrawals than they could even during the 2007–2009 financial crisis.

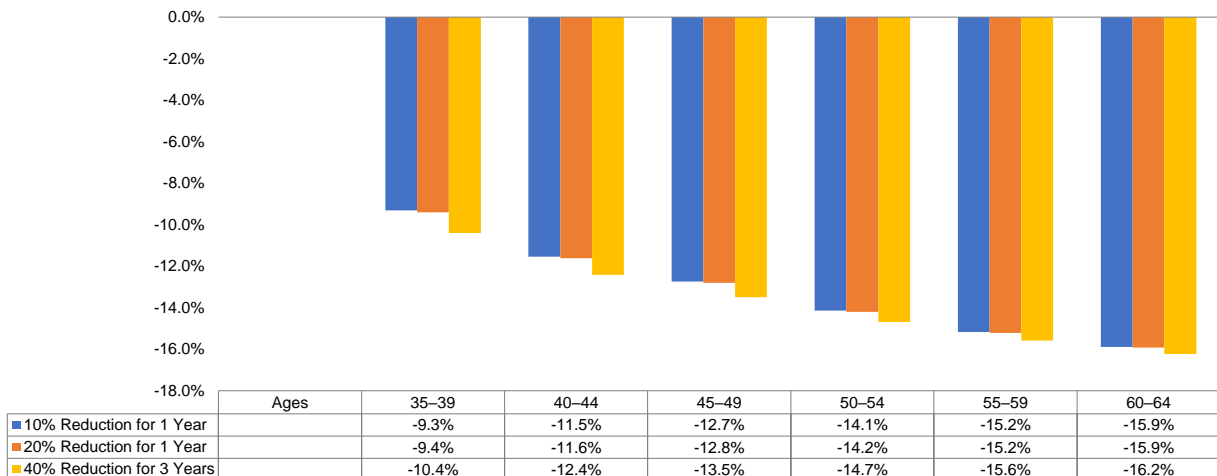
Appendix: Impact of Individual Scenarios by Age

Figure 16
Scenario B: Increase in Shortfalls Due to Plan Sponsors Reducing Matching Contributions for a Given Period of Time



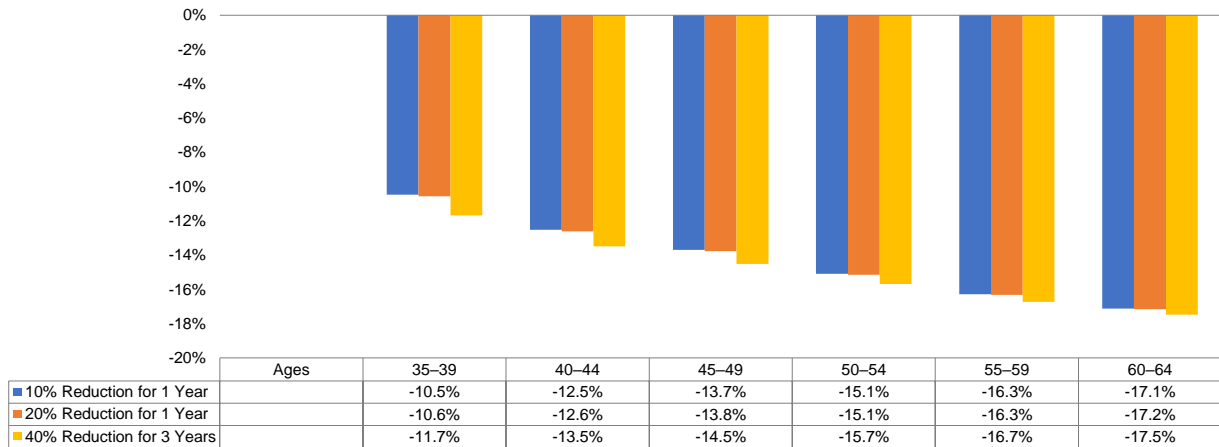
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario B: Use 20Q1 investment returns but X percent of sponsors suspend matches for Y years.

Figure 17
Scenario B: Decrease in Surpluses Due to Plan Sponsors Reducing Matching Contributions for a Given Period of Time



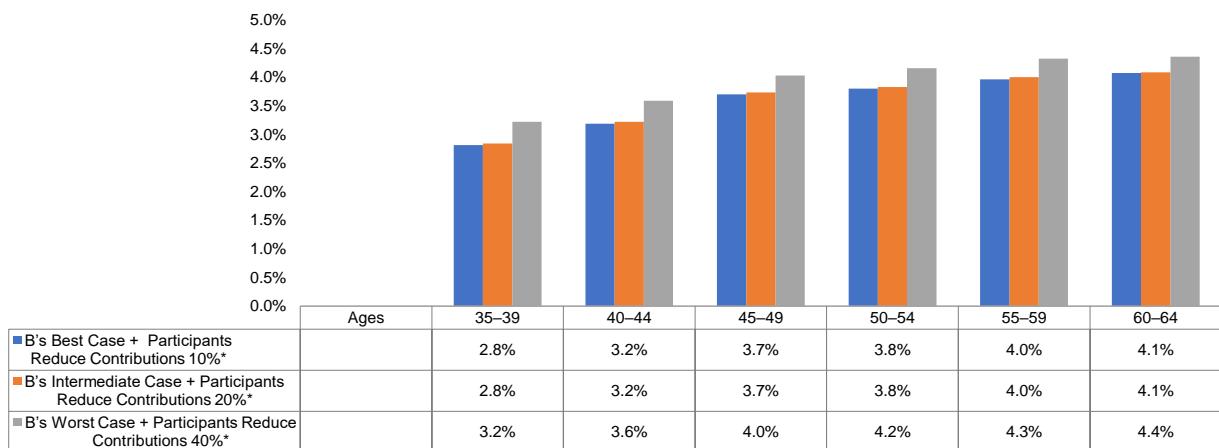
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario B: Use 20Q1 investment returns but X percent of sponsors suspend matches for Y years.

Figure 18
Scenario B: Decrease in Net Surpluses Due to Plan Sponsors Reducing Matching Contributions for a Given Period of Time



Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario B: Use 20Q1 investment returns but X percent of sponsors suspend matches for Y years.

Figure 19
Scenario C: Increase in Shortfalls Due to Plan Sponsor and Participant Contribution Changes



Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario C: Same as B with X percent of sponsors suspending contributions for Y years and their participants reducing contributions by Z percent.

*Participants in plans with suspended matching contributions.

Figure 20
Scenario C: Decrease in Surpluses Due to Plan Sponsor and Participant Contribution Changes



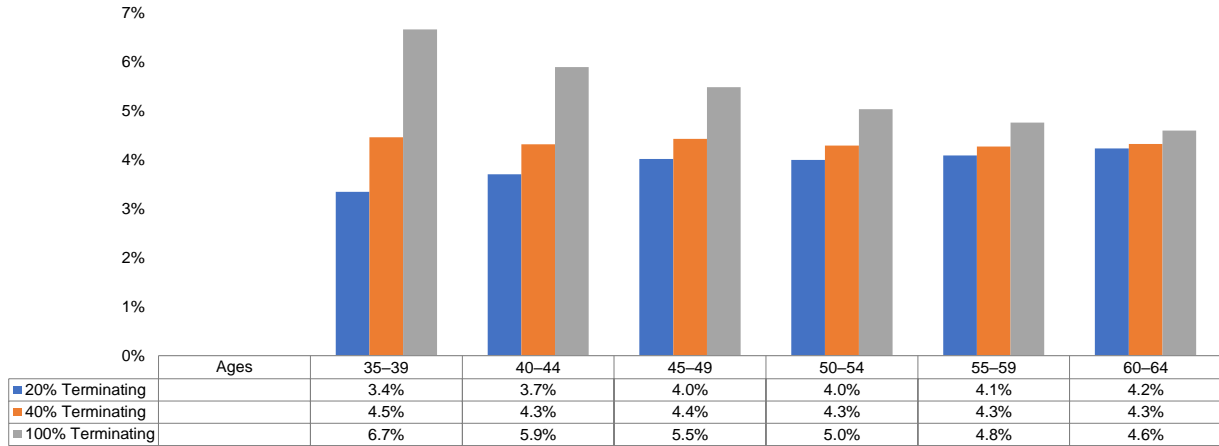
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario C: Same as B with X percent of sponsors suspending contributions for Y years and their participants reducing contributions by Z percent.
 *Participants in plans with suspended matching contributions.

Figure 21
Scenario C: Decrease in Net Surpluses Due to Plan Sponsor and Participant Contribution Changes



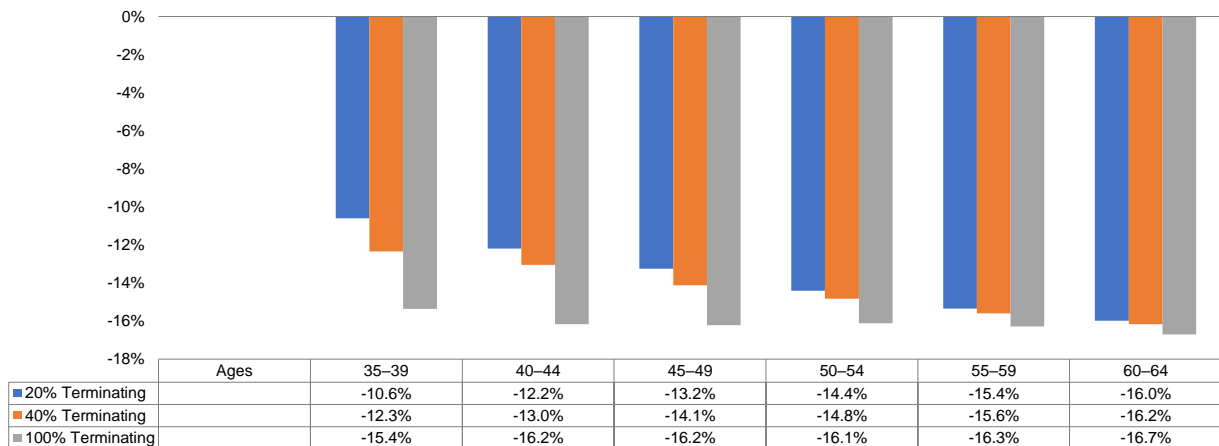
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario C: Same as B with X percent of sponsors suspending contributions for Y years and their participants reducing contributions by Z percent.
 *Participants in plans with suspended matching contributions.

Figure 22
Scenario D: Increase in Shortfalls Due to a Certain Percentage of Plans With <\$10 Million in Assets Terminating*



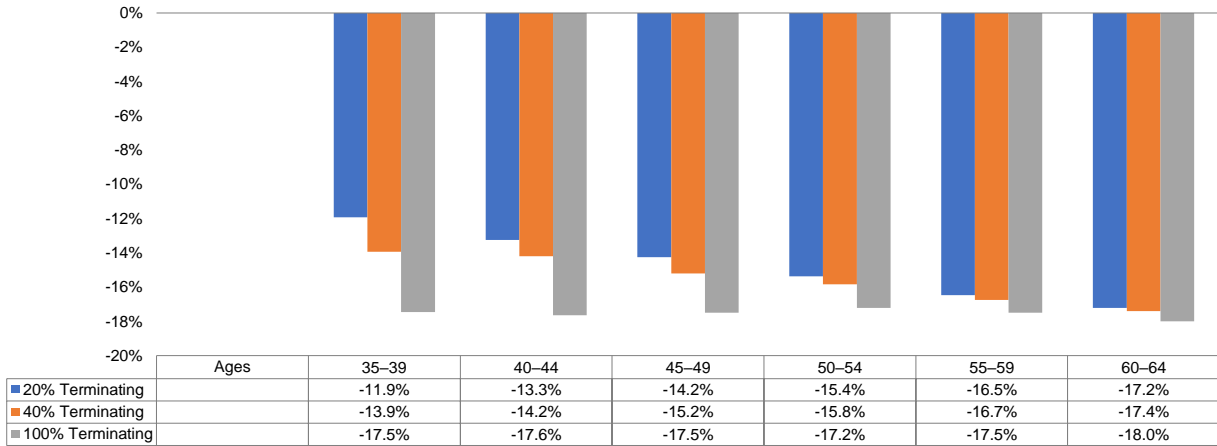
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario D: Use 20Q1 investment returns but X percent of plans with less than \$10 million in assets permanently terminate the plan.
 *Assumes 1st Quarter 2020 returns.

Figure 23
Scenario D: Decrease in Surpluses Due to a Certain Percentage of Plans With <\$10 Million in Assets Terminating*



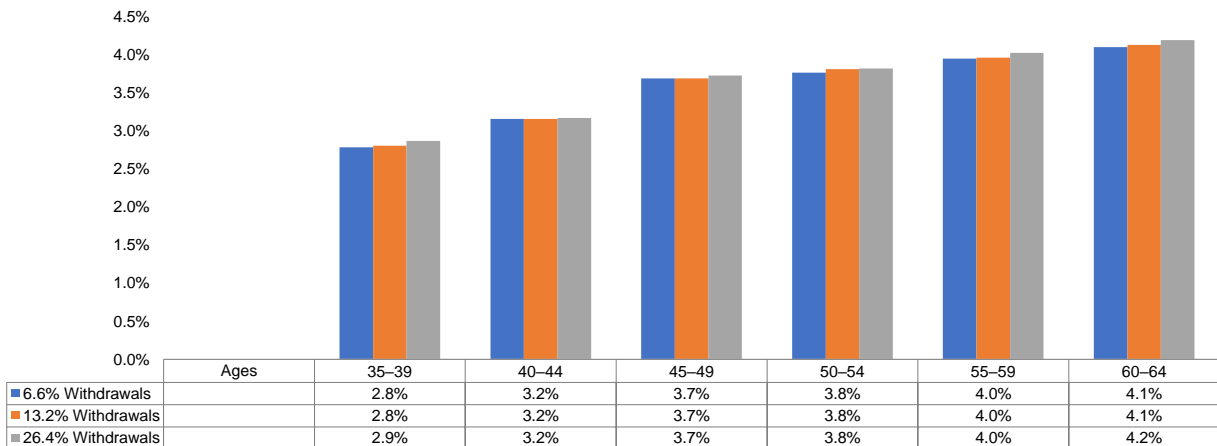
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario D: Use 20Q1 investment returns but X percent of plans with less than \$10 million in assets permanently terminate the plan.
 *Assumes 1st Quarter 2020 returns.

Figure 24
Scenario D: Decrease in Net Surpluses Due to a Certain Percentage of Plans With <\$10 Million in Assets Terminating*



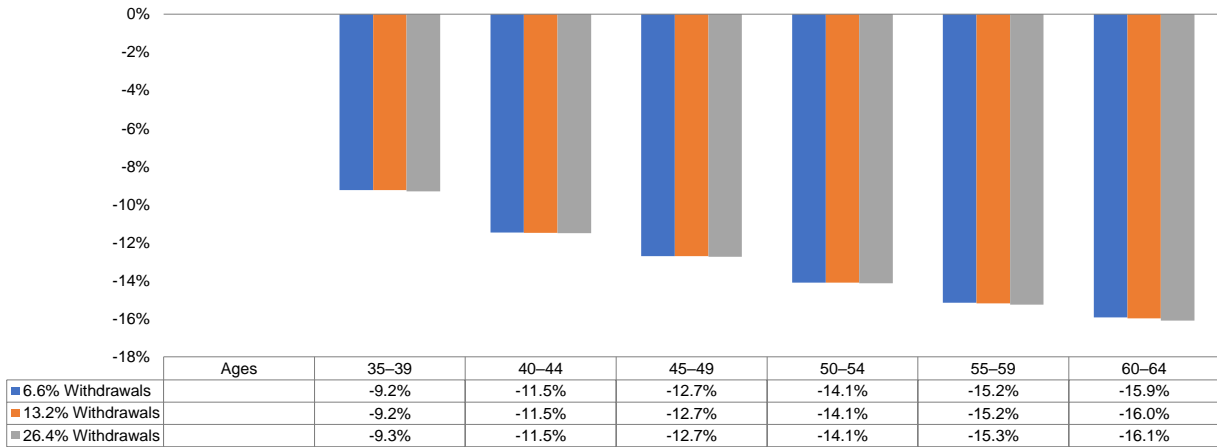
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario D: Use 20Q1 investment returns but X percent of plans with less than \$10 million in assets permanently terminate the plan.
 *Assumes 1st Quarter 2020 returns.

Figure 25
Scenario E: Increase in Shortfalls Due to a One-Time Increase in Participant Withdrawals*



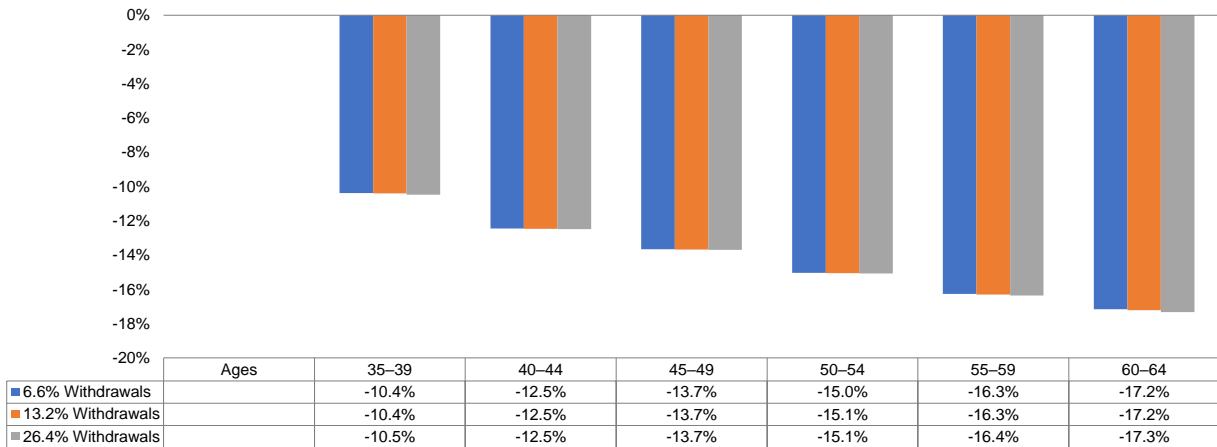
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario E: Use 20Q1 investment returns but assume a one-time increase in total withdrawal of X percent.
 *Assumes 1st Quarter 2020 returns.

Figure 26
Scenario E: Decrease in Surpluses Due to a One-Time Increase in Participant Withdrawals*



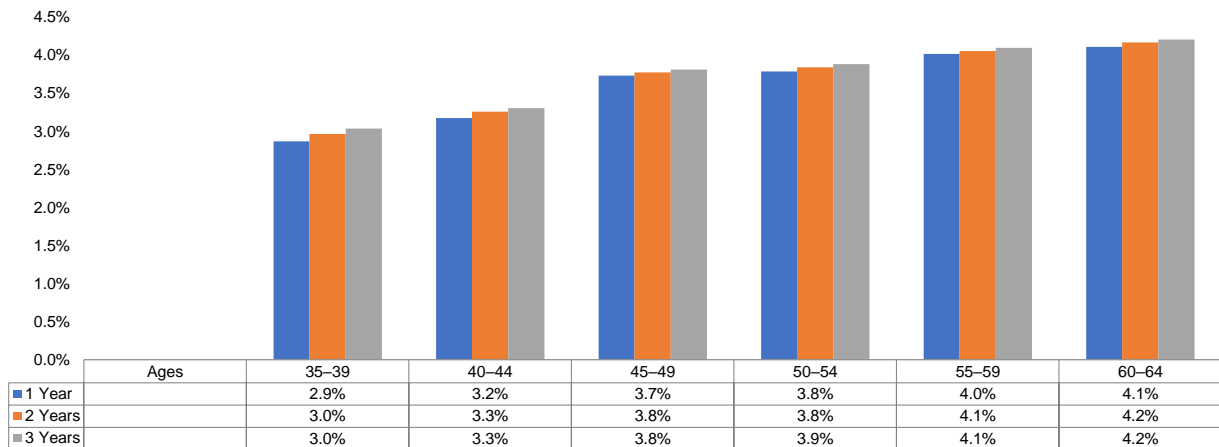
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario E: Use 20Q1 investment returns but assume a one-time increase in total withdrawal of X percent.
 *Assumes 1st Quarter 2020 returns.

Figure 27
Scenario E: Decrease in Net Surpluses Due to a One-Time Increase in Participant Withdrawals*



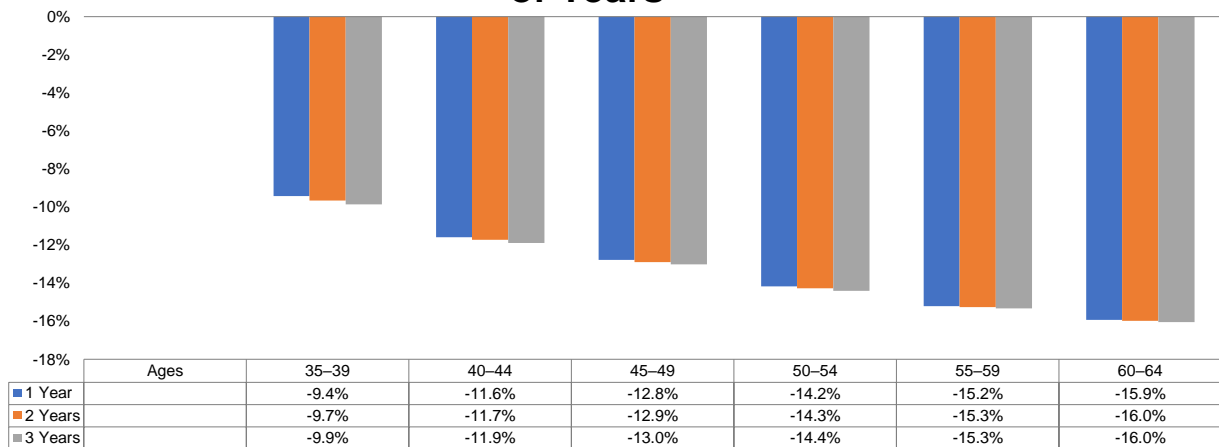
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario E: Use 20Q1 investment returns but assume a one-time increase in total withdrawal of X percent.
 *Assumes 1st Quarter 2020 returns.

Figure 28
Scenario F: Increase in Shortfalls Due to Unemployment Causing a 10 Percent Decrease in Eligibility for a Certain Number of Years*



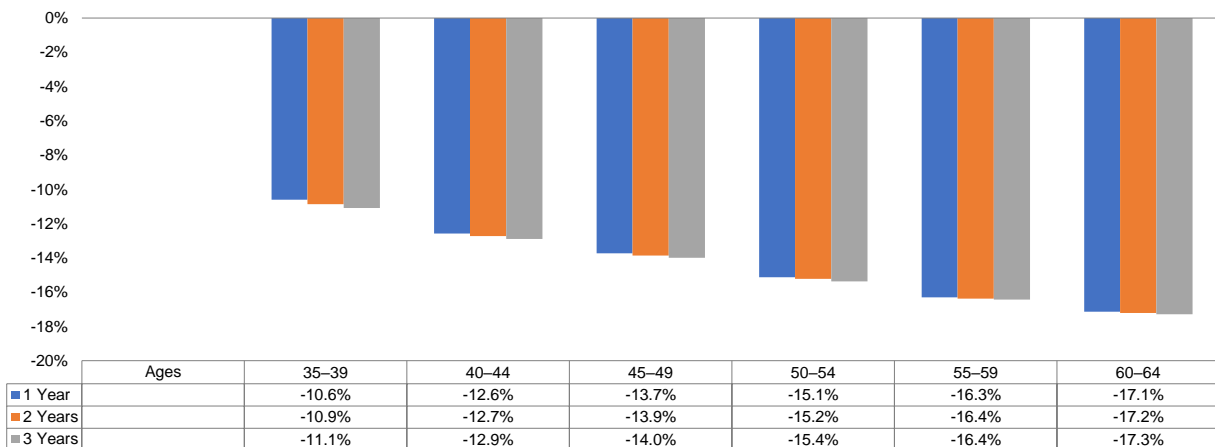
Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario F: Use 20Q1 investment returns but unemployment causes a 10 percent decrease in eligibility for X years.
 *Assumes 1st Quarter 2020 returns.

Figure 29
Scenario F: Decrease in Surpluses Due to Unemployment Causing a 10 Percent Decrease in Eligibility for a Certain Number of Years*



Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario F: Use 20Q1 investment returns but unemployment causes a 10 percent decrease in eligibility for X years.
 *Assumes 1st Quarter 2020 returns.

Figure 30
Scenario F: Decrease in Net Surpluses Due to Unemployment Causing a 10 Percent Decrease in Eligibility for a Certain Number of Years*



Source: EBRI Retirement Security Projection Model® Version 3623. Note: Scenario F: Use 20Q1 investment returns but unemployment causes a 10 percent decrease in eligibility for X years.
 *Assumes 1st Quarter 2020 returns.

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VanDerhei, Jack, Sarah Holden, Luis Alonso, and Steven Bass. "401(k) Plan Asset Allocation, Account Balances, and Loan Activity in 2016," *EBRI Issue Brief*, no. 458, and *ICI Research Perspective*, Vol. 24, no. 6 (September 2018).

Endnotes

¹ VanDerhei (2009).

² VanDerhei and Copeland (2010).

³ For additional analysis of the impact of PPA on retirement balances for 401(k) participants, see VanDerhei and Copeland (2008).

⁴ VanDerhei (2011).

⁵ The S&P 500 index declined by 24.2 percent in the first quarter of 2020.

⁶ The S&P 500 index declined by 50.7 percent between July 20, 2007, and March 13, 2009.

⁷ VanDerhei, Holden, Alonso, and Bass (2018) reported that, as of year-end 2016 data from the EBRI/ICI 401(k) Database, participants in their 20s had an equity allocation of 79.5 percent, while those in their 60s had an equity allocation of 55.4 percent. Equities include equity funds, company stock, and the equity portion of balanced funds.

⁸ See VanDerhei (2014) for additional detail.

⁹ For 2019, EBRI found that 40.6 percent of all U.S. households where the head of the household was between 35 and 64, inclusive, were projected to run short of money in retirement. That was down by 1.7 percentage points vs. 2014. See VanDerhei (March 2019) for more detail.

¹⁰ A Towers Watson (2011) study in January 2011 found that since late 2008, 13 percent of respondents have suspended their match, and 5 percent have reduced their match.

¹¹ VanDerhei (November 2009).

¹² Adams (2020).

¹³ Holden and Schrass (2019). NB: This is NOT saying that withdrawal probabilities increase by that percentage.

¹⁴ It is interesting to note that this increase in retirement deficits would be reduced from \$136.43 billion to only \$10.74 billion if the first quarter 2020 investment losses were amortized over the next five years.