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Can America Afford Tomorrow's Retirees: Results From the EBRI-ERF Retirement Security Projection Model

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Issue Brief

- American retirees will have at least $45 billion less in retirement income in 2030 than what they will need to cover basic expenditures and any expense associated with an episode of care in a nursing home or from a home health care provider. The aggregate deficit in retiree income during the decade ending 2030 will be at least $400 billion. These findings are from a new analysis by the Employee Benefit Research Institute (EBRI) in collaboration with the Milbank Memorial Fund, known as the EBRI-ERF Retirement Security Projection Model, contained in this *EBRI Issue Brief*.

- Some future retirees could avert a personal shortfall by increasing their savings rate. In some instances, saving an additional 5 percent of compensation for the remainder of one's career would be adequate to achieve this result. But this is a virtual impossibility for the majority of older, low-income single women, where needed additional savings would exceed 25 percent of compensation.

- Achieving a 90 percent confidence level for sufficient retirement income would require added savings of no more than 10 percent for median couples above the lowest income quartile born since 1945. Added savings of no more than 5 percent would assure a 75 percent certainty for these groups.

- The odds of having sufficient income to afford basic expenditures throughout retirement with an additional savings of 5 percent of compensation are significantly higher for those in the youngest cohorts. This ranges from a low of approximately 30 percent for those in the lowest income quartiles that are on the verge of retirement to more than 85 percent for those with above median income in the 1961–1965 birth cohort.

- The President's Commission on Pension Policy recommended a mandatory savings plan in 1981. The President's Commission on Social Security Reform recommended individual accounts for Social Security in 2002. Although the analysis presented here did not explicitly model reform proposals for mandatory individual accounts, the results illustrate how Social Security reforms that would cut current law benefits would interact with a mandatory additional savings of 5 percent of compensation.

- Despite growing interest in mechanisms that allow retirees to turn their housing equity into income, neither annuitizing the value of their residence, nor selling it when required to provide added income, significantly moderates the projected problem.

- When other parameters are held constant, couples fare best and single women worst.

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Introduction

America's elderly face an income shortfall between 2020 and 2030 of at least $400 billion—including at least $45 billion in 2030 alone—just in their ability to cover basic living expenses and any expense associated with an episode of care in a nursing home or from a home health care provider, which is usually substantially below their pre-retirement standard of living.[1] This shortfall is between the amount required for the elderly to afford basic expenditures for the remainder of their life and the income and benefits they are actually projected to have (Social Security, Medicare, Medicaid, employment-based defined benefit and contribution plans (401(k) plans), and individual retirement accounts (IRAs)), according to this study by the Employee Benefit Research Institute (EBRI) in collaboration with the Milbank Memorial Fund.

This study follows previous studies using similar methodology for the states of Kansas, Massachusetts and Oregon conducted by EBRI and Milbank in collaboration with officials from those states. This *Issue Brief* presents preliminary estimates of the first attempt to use this model on a national basis.

Much has been written about the limited saving done by most Americans, and these new findings underline the consequences. This gap will exist if Americans' current patterns of using tax-preferred retirement savings vehicles continue and government programs for elderly Americans remain in their present form. Any reforms of Social Security that reduce future benefits without reducing taxes would expand the gap.

The new findings suggest that while many middle-income and upper-income Americans could provide for their own future by saving more, this remedy is beyond the reach of most lower-income individuals. Some upper-income Americans, those most likely to have nonretirement savings accounts, may have already accumulated sufficient savings, but they appear to be a small minority.

The study forecasts the dollar magnitude of shortfalls that may result in potential demands on public, charitable, and family resources beyond those already promised to allow the elderly to afford the same basic expenses for the duration of their life. For individuals, it sends a message to start saving now, and quantifies the additional needed savings beyond those already accrued and expected to be accrued in tax-preferred savings vehicles. The projected baseline national aggregate shortfall presupposes no change in individual behavior or in public programs for elderly retirement income and health care. However, the shortfall could not feasibly be entirely eliminated simply by increased personal savings, because many families do not earn enough to make the required savings. These demands would be at least $17 billion greater by 2030 than they are projected to be in 2004 (Figure 1).

Most at risk are single women in the lowest income quartile, who simply lack the resources to save enough for retirement. In most scenarios, they would have to save an improbable amount exceeding 25 percent of their annual pay in addition to current savings within tax-preferred retirement savings vehicles until they reach retirement age to afford basic expenditures during their retirement years. On the other hand, couples and those in the top income quartile are often estimated to have a gap that could be closed fairly easily.

This study provides analysis based on age, marital status, and income calculating the average deficit between the amount needed to fund basic expenditures and retirement income a family (couple or single) will have in retirement. The odds of having sufficient income to afford these basic expenditures with added savings of 5 percent of compensation is significantly higher for those in the youngest cohorts. This ranges from a low of approximately 30 percent for those in the lowest income quartiles near retirement to more than 85 percent for those with above-average income in the 1961–1965 birth cohort. It also considers the largest nonretirement

Figure 1
National Retirement Savings Shortfall for Population Age 65 and Over
(by Housing Equity Scenario[a])
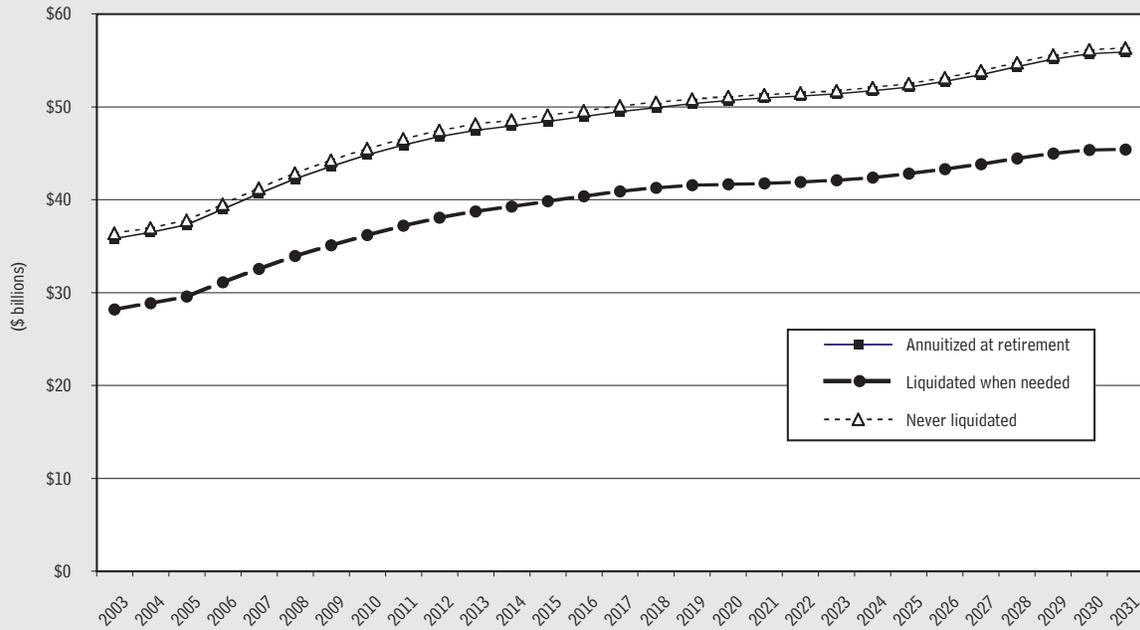
Source: EBRI-ERF Retirement Security Projection Model.

[a] Assuming status quo for Social Security benefits and that current retirees are similar to the oldest cohort of current workers.

specific asset most families have—housing equity—for its effects on this shortfall through annuitization of the equity or a lump-sum payment of it when needed to pay expenses.

An illustrative example involves individuals achieving a 90 percent chance that income will be sufficient to afford basic expenditures during one's retirement years without liquidating housing equity (Figure 3). The figure shows:

• Most couples in the top two income quartiles born after 1945 can achieve this goal by annually saving an additional 5 percent of earnings.

• The median single male born prior to 1951 who is in the bottom two income quartiles would have to save an additional 15 percent of earnings, at a minimum.

Results

How Much More Must Be Saved to Afford the Simulated Postretirement Expenses?

The primary objective of this *Issue Brief* is to combine the simulated retirement income and wealth with the simulated retiree expenditures to determine how much each family unit would need to save today (as percentage of their current wages) to maintain a pre-specified "comfort level" (i.e., confidence level) that they will be able to afford the simulated expenses for the remainder of the lifetime of the family unit (i.e., death of second spouse in a family). We report these savings rates by age cohort, family status (at retirement) and gender. Six five-year birth cohorts are simulated. The oldest group was born in the period 1936 to 1940 inclusive while the youngest group was born in the period 1961 to 1965 inclusive. Three combinations of gender/family status at retirement were reported: family, single male, and single female. In addition, the relative income was reported by estimating lifetime income quartiles (from 2002 though retirement age) for each of the 18 combinations of birth

Source: EBRI-ERF Retirement Security Projection Model.
[a] 25% = 25% or more.

Source: EBRI-ERF Retirement Security Projection Model.
[a] 25% = 25% or more.

cohort and gender/family status at retirement.

It is important to note that within each of the groups modeled there will undoubtedly be significant percentages in the zero category as well as those at levels beyond which anyone could reasonably assume more than a de minimis number of individuals could possibly save. We account for these situations in two ways. First, we report medians for each of the groups. In other words, the numbers presented in Figures 2–19 provide a number representing the estimate for the 50th percentile when ranked by percentage of compensation. Second, we limit the reported values to 25 percent of compensation under the assumption that few, if any, family units would be able to contribute in excess of this percentage on a continuous basis until retirement age.

It is also important to note that these percentages merely represent savings that need to be generated in addition to what retirement income and/or wealth is simulated by the model. Therefore, if the family unit is already generating savings for retirement that is not included in defined benefit or defined contribution plans, IRAs, Social Security and/or net housing equity, that value needs to be deducted from the estimated percentages.

After the retirement income and wealth was simulated for each family unit, we simulated 1,000 observations (from retirement age until death of the individual for single males and single females or the second person to die for families) and computed the present value of the aggregated deficits at retirement age. At that point, we rank ordered the observations in terms of the present value of the deficits and determined the 75th and 90th percentiles of the distribution. Next we determined the future simulated retirement income accumulated to retirement age and used this information to determine the percentage of compensation that would need to be saved to have sufficient additional income to offset the present value of accumulated deficits for the 75th and 90th percentiles of the distribution.

Figure 2 shows the median percentage of compensation that must be saved each year until retirement for a 75 percent confidence level when combined with simulated retirement wealth, assuming current Social Security benefits and that housing equity is never liquidated.

For example, all gender/family combinations in the first two income quartiles for the oldest birth cohort are at the 25 percent of compensation threshold. For those in the highest income quartile for this birth cohort, the percentages of compensation needed to be saved are 23.8 percent for singe females, 13.9 percent for single males, and 6.1 percent for families.

Figure 3 shows the median additional savings required to provide retirement adequacy in 9 out of 10 simulated life paths. In this case, nearly all of the gender/family status at retirement combinations for the first three income quartiles of the earliest birth cohort are at the threshold (the median for families in the third quartile is estimated at 24.8 percent of compensation). Those in the highest income quartile for this birth cohort all have requirements that would prove difficult if not impossible to implement: single females are estimated to now need to save more than 25 percent of compensation, single males 22.1 percent of compensation, and families 10.1 percent of compensation.

Figure 4 provides the same analysis as Figure 2; however it is now assumed that any net housing equity is annuitized at age 65. For an example of the impact of this additional retirement income source, the median for the single males in the fourth income quartile for the 1936–1940 birth cohort was estimated to be 13.9 percent in Figure 2 (assuming housing equity is never liquidated) while it is estimated to be 13.0 percent in Figure 4. Figure 5 provides similar results for the 90 percent confidence level.

Figure 6 provides another alternative to Figure 2, this time assuming that housing equity is liquidated as needed. This appears to have a greater impact on the amount of compensation that individuals will need to save to produce a specific level of confidence. For
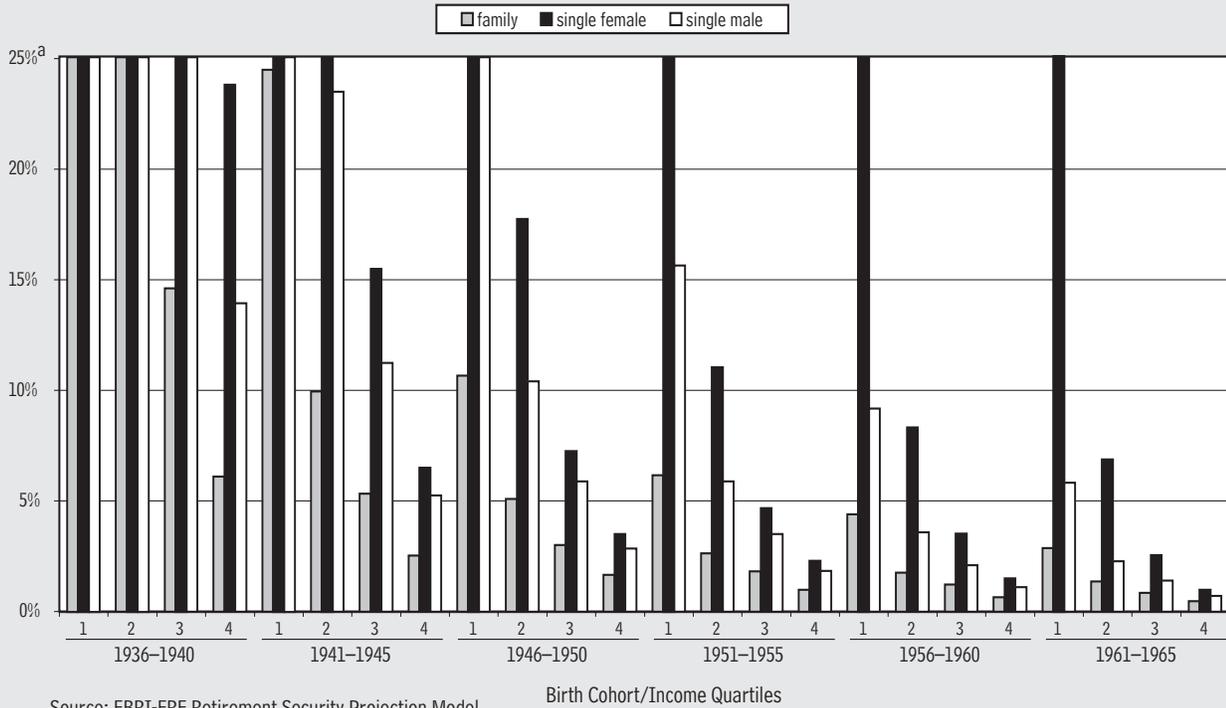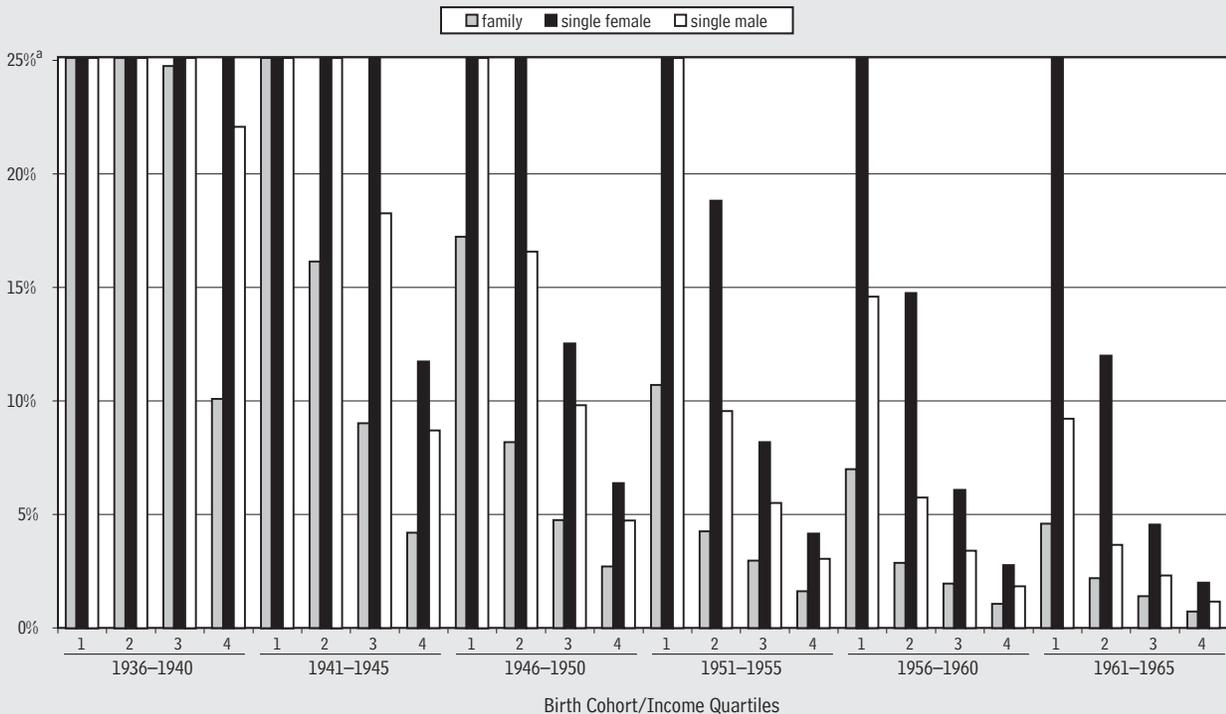
Figure 4

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES CURRENT SOCIAL SECURITY AND HOUSING EQUITY IS ANNUITIZED AT 65)

Birth Cohort/Income Quartiles
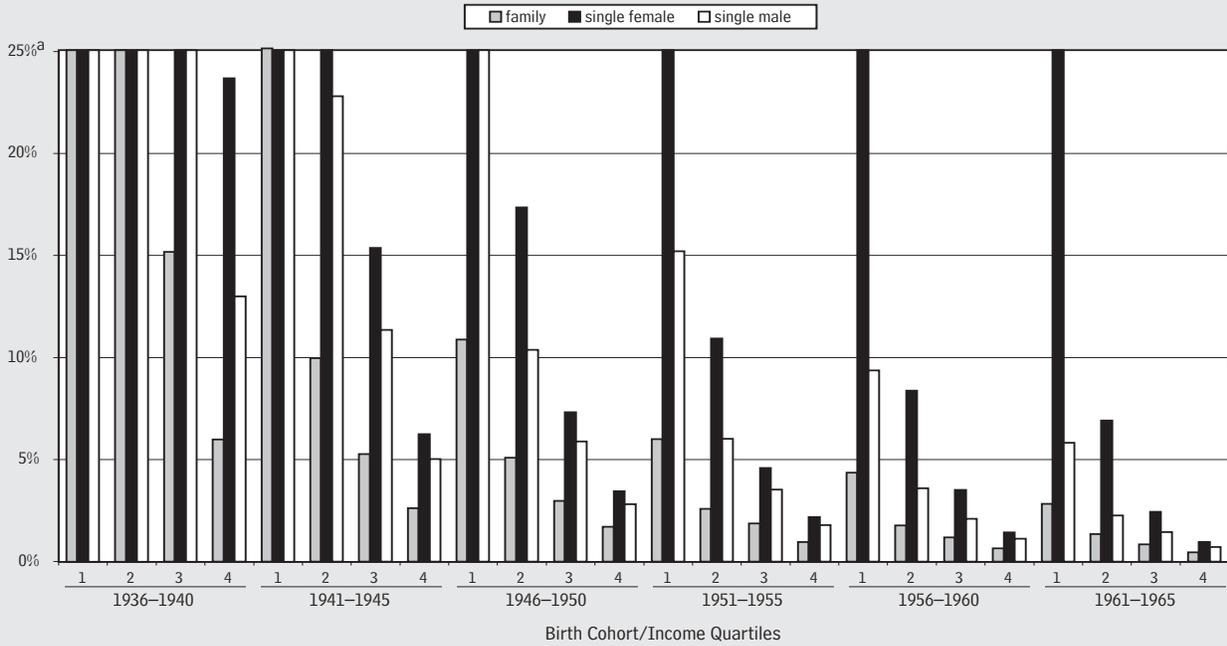
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

Figure 5

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES CURRENT SOCIAL SECURITY AND HOUSING EQUITY IS ANNUITIZED AT 65)

Birth Cohort/Income Quartiles

Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

example, the median for the single males in the fourth income quartile for the 1936–1940 birth cohort mentioned above was estimated to be 10.8 percent in Figure 6. Figure 7 provides similar results for the 90 percent confidence level.

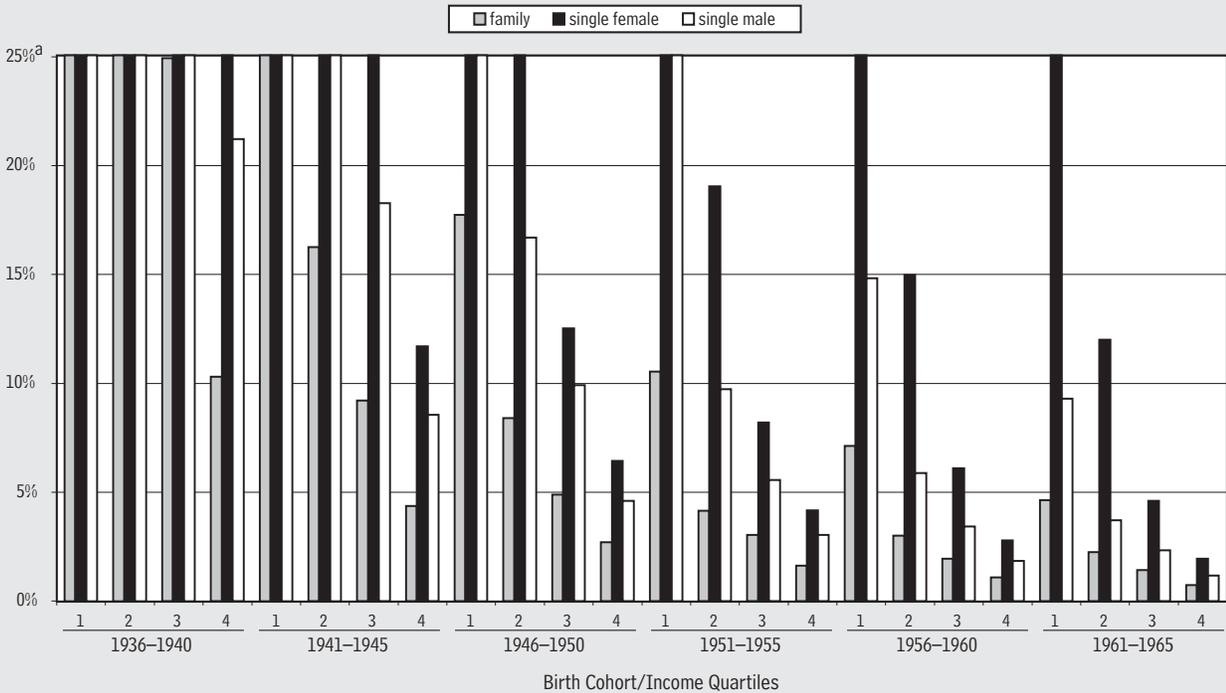The impact of moving to a reduced Social Security benefits scenario, assuming housing equity is never liquidated, can be seen by comparing Figure 12 with Figure 2.[2] Given their increased reliance on Social Security benefits as a portion of their overall retirement income, one would expect to observe a larger increase in the median compensation percentages for single females than for single males and for those in the lower income quartiles, cet. par. Comparing the unconstrained groupings in the 1941–45 birth cohort shows this is exactly what is occurring in the model. For example, the median for single females versus the single males in the third and fourth income quartiles for this birth cohort shows the following increases (in percentages) as a result of moving to the reduced Social Security benefits:

Income Quartile	Single Female	Single Male
3	15.9-15.5=0.4	11.5-11.2=0.3
4	6.8-6.5=0.3	5.4-5.2=0.2

Theoretically, there is an indeterminate impact of birth cohort upon the increase in compensation percentages required to offset the reduced Social Security benefits. Even though the younger birth cohorts experience a larger reduction in benefits, this will be offset by the fact that they have a longer period of time for their savings to accumulate.

The impact of moving to a Social Security reform scenario based on increasing the normal retirement age (NRA) and increasing payroll taxes assuming housing equity is never liquidated can be seen by comparing Figure 14 with Figure 2.[3] One would expect a similar, but less severe, impact as in the previous reform scenario. Comparing the same four groups as above shows

the following increases (in percentages) as a result of moving to the reduced Social Security benefits:

Income Quartile	Single Female	Single Male
3	15.7-15.5=0.2	11.2-11.2=0.0
4	6.6-6.5=0.1	5.2-5.2=0.0

The following index identifies which figure the reader should consult for a particular combination of Social Security reform and housing equity scenarios (each combination is represented by two figures, one denoting the medians percentage of compensation required for a 75 percent confidence level and the other the percentages for a 90 percent confidence level):

	Status of Social Security		
Treatment of Housing Equity	Current Social Security	Increased Taxes and Normal Retirement Age	Reduced Benefit Reform
Housing Never Liquidated	Figures 2 and 3	Figures 14 and 15	Figures 12 and 13
Housing Annuitized at Age 65	Figures 4 and 5	Figures 16 and 17	Figures 10 and 11
Housing Liquidated as Needed	Figures 6 and 7	Figures 18 and 19	Figures 8 and 9

Figure 20 provides another way of illustrating which cohorts may be the most vulnerable to inadequate financial resources in retirement. This figure starts with the baseline scenario described above (current Social Security benefits and no liquidation or annuitization of net housing equity) and assumes that each worker contributes an additional 5 percent of compensation from 2003 until retirement age to supplement his or her Social Security and tax-qualified retirement plans. The percentage of each cohort estimated to have sufficient retirement income and/or wealth to cover the simulated

Figure 6

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES CURRENT SOCIAL SECURITY AND HOUSING EQUITY LIQUIDATED AS NEEDED)

Birth Cohort/Income Quartiles
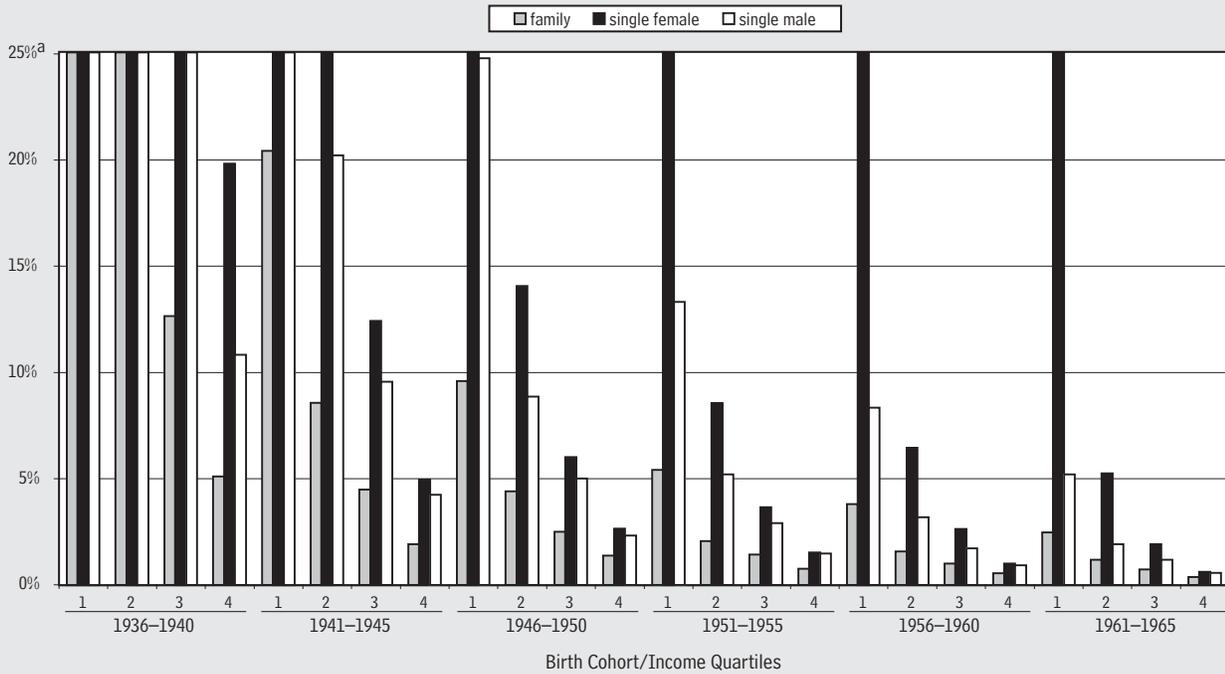
Source: EBRI-ERF Retirement Security Projection Model.
a 25% = 25% or more.

Figure 7

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES CURRENT SOCIAL SECURITY AND HOUSING EQUITY LIQUIDATED AS NEEDED)

Birth Cohort/Income Quartiles
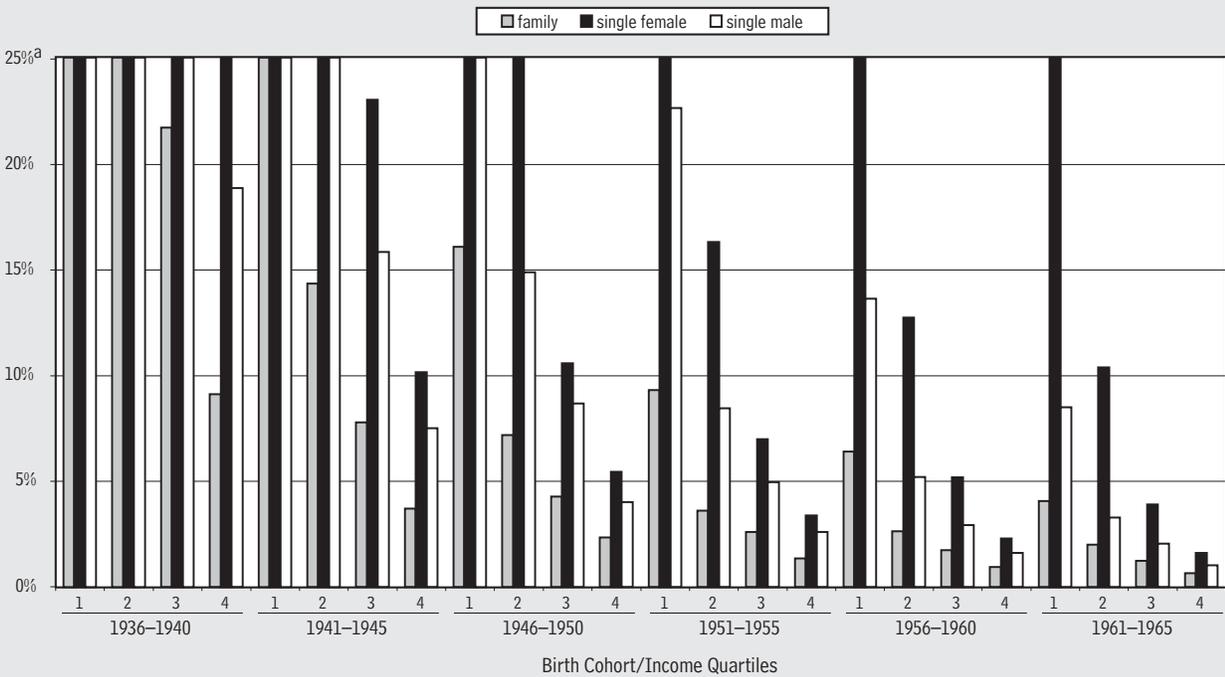
Source: EBRI-ERF Retirement Security Projection Model.
a 25% = 25% or more.

retirement expenses described earlier is displayed. For example, approximately 30 percent of the simulated life-paths for the lowest income quartile for those in the 1936–1940 birth cohort would be expected to have sufficient retirement resources. However, at least 85 percent of the simulated life-paths for the third or fourth income quartiles for those in the 1961–1965 birth cohort would be sufficient. This is in large part due to the fact that the younger cohorts will have additional years to accumulate the additional 5 percent of compensation. For each birth cohort, the lower income quartiles are in more risk of insufficient retirement income than their higher paid counterparts. Moreover, single females tend to exhibit more vulnerability than single males while families are typically the least vulnerable.

Figure 21 illustrates the impact of moving from the status quo for Social Security benefits to the reduced benefits Social Security reform described above. When the percentages in this figure are compared to those in Figure 20, the largest impact is experienced by single females with the lowest income in the 1961–1965 birth cohort (a reduction of 3.3 percentage points). The large impact on this cohort would be expected given that the simulated Social Security benefit reduction is assumed to increase over time and that low-income workers depend more on Social Security benefits. However, the Social Security reform scenario is also estimated to reduce the percentage of those with sufficient retirement income by at least 2.5 percentage points for most of the first income quartiles, regardless of gender and family status.

Aggregate Deficits

Nominal annual deficits were simulated for all residents age 65 and over after Medicaid reimbursements assuming status quo for Social Security benefits and that current retirees are similar to the oldest cohort of current workers (Figure 1). The results varied by housing equity scenario: the annual deficit for 2003 was estimated to be $36.3 billion if housing equity is never

liquidated, $35.8 billion if all housing equity is annuitized at age 65 and $28.1 billion if housing equity was liquidated as needed to meet potential deficits. By the year 2031, the corresponding values are estimated to have increased to be $56.3 billion if housing equity is never liquidated, $55.9 billion if all housing equity is annuitized at age 65, and $45.4 billion if housing equity was liquidated as needed to meet potential deficits.

Conclusion

The EBRI-ERF Retirement Security Projection Model has previously been used to analyze retirement security for future generations of retirees in Oregon, Kansas and Massachusetts. This *Issue Brief* presents preliminary estimates of the first attempt to use this model on a national basis to estimate the amount of money that today's workers will need to save to have sufficient retirement income and/or wealth to afford basic retirement expenditures plus the potentially catastrophic costs of nursing home and home health care.

We have purposely structured many of our assumptions to provide conservative estimates of the amounts that would be needed to be saved while employees are working to alleviate any deficits. For example, we have assumed in this version of the model that all employees continue to work until age 65, even though there has been a long-term trend toward earlier retirement (albeit one that seems to be reversing in recent years). We have also assumed that individual account balances are "self-annuitized" over a period of time that expands the individual and/or family life expectancy by five years, even though there appears to be limited evidence that this type of buffer is actually contemplated by retirees as a risk-reduction devices.

Even with these conservative biases built in, the numbers appear troubling for some age cohorts and almost fatalistic for others. The good news is that if

Figure 8

**PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES**
(ASSUMES REDUCED BENEFITS SOCIAL SECURITY AND HOUSING EQUITY LIQUIDATED AS NEEDED)

Birth Cohort/Income Quartiles
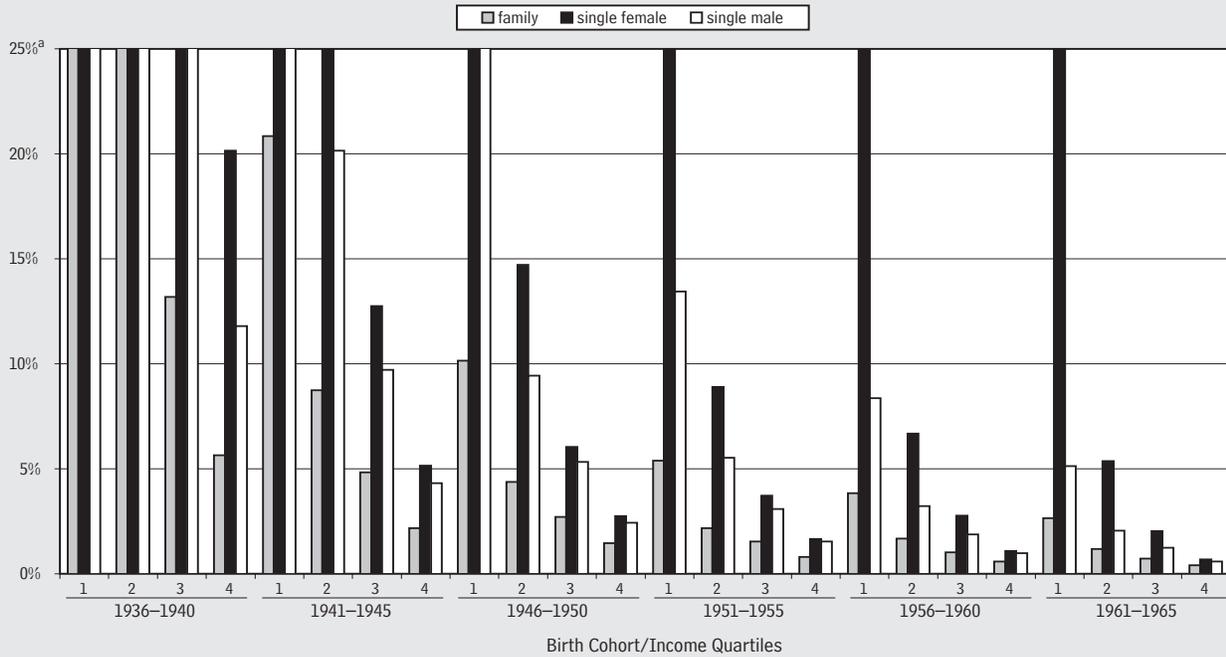
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

Figure 9

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES REDUCED BENEFITS SOCIAL SECURITY AND HOUSING EQUITY LIQUIDATED AS NEEDED)

Birth Cohort/Income Quartiles
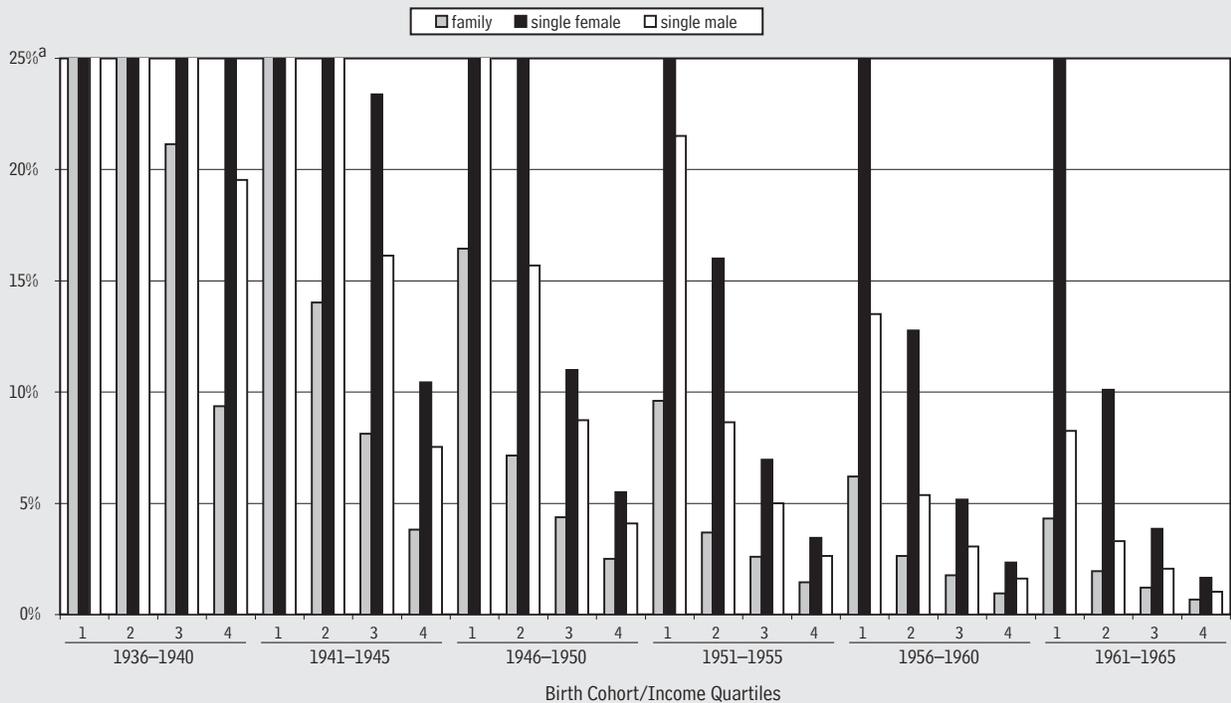
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

many of the younger cohorts begin saving a reasonable amount to supplement their Social Security and qualified retirement plans now, they have a good chance of providing themselves with reasonable assurance that they will at least be able to cover basic retirement expenditures. However, changes in public policy and additional resources from families and charities would be required to provide adequate retirement income for retirees with greater longevity who suffer serious and persistent chronic disease. Our estimates include both the status quo for Social Security benefits as well as two reform scenarios that would decrease benefits for future generations.

As we continue our simulation efforts with this model, we hope to pursue other public policy avenues relevant to economic security for retirees. For example, we hope to be able to integrate empirical data on long-term care insurance purchases into the model within the next year that will allow us to determine the impact of these policies on an individual's prospects for adequate retirement income, as well as the potential benefits to federal and state governments via the likely reduction in Medicaid expenditures.

Both for individuals and for public policy makers, being able to quantify the extent of the impending shortfall in basic retirement income adequacy has obvious implications. For those lucky enough to be young and disciplined at saving, getting started now is likely to assure them a comfortable retirement. Since there are many who are old (or nearing retirement age) and in the lower-income brackets, public resources are likely to be called upon either directly or indirectly to deal with their inability to finance their old age. Knowing the extent of the future problem will at least enable policy makers to try to prepare to deal with these issues when they arrive.

The Analysis: Estimating Current and Future Accrued Benefits and Account Balances From the EBRI-ERF Model

The EBRI-ERF model is based on a six-year time series of administrative data from more than 10 million 401(k) participants and more than 30,000 plans, as well as a time series of several hundred plan descriptions used to provide a sample of the various defined benefit and defined contribution plan provisions applicable to plan participants. In addition, several public surveys based on participants' self-reported answers (the Survey of Consumer Finances [SCF], the Current Population Survey [CPS], and the Survey of Income and Program Participation [SIPP]) were used to model participation, wages, and initial account balance information.

This information is combined with U.S. Department of Labor Form 5500 data to model participation and initial account balance information for all defined contribution participants, as well as contribution behavior for non-401(k) defined contribution plans. Asset allocation information is based on previously published results of the EBRI/ICI Participant-Directed Retirement Plan Data Collection Project and employee contribution behavior to 401(k) plans is provided by an expansion of a method based on both employee demographic information as well as plan matching provisions.

A combination of Form 5500 data and self-reported results were also used to estimate defined benefit participation models; however, it appears information in the latter is rather unreliable with respect to estimating current and/or future accrued benefits. Therefore, a database of defined benefit plan provisions for salary-related plans was constructed to estimate benefit accruals.

Figure 10

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES

(ASSUMES REDUCED BENEFITS SOCIAL SECURITY AND HOUSING EQUITY IS ANNUITIZED AT 65)

Birth Cohort/Income Quartiles
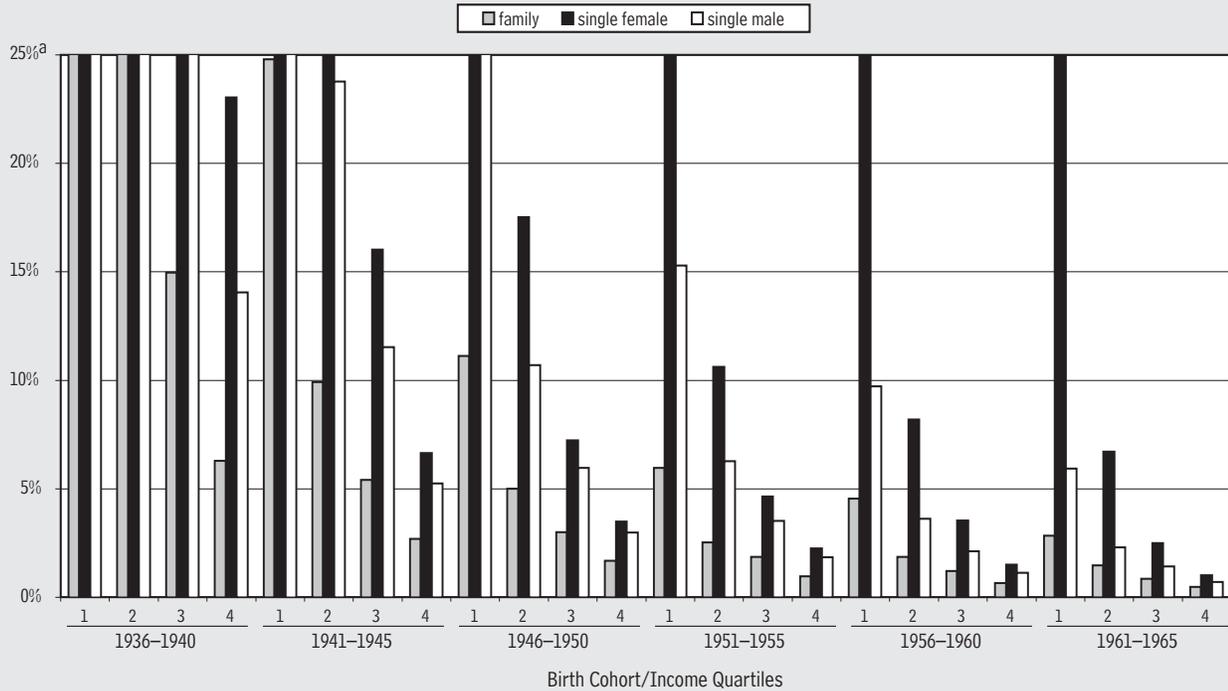
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

Figure 11

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES

(ASSUMES REDUCED BENEFITS SOCIAL SECURITY AND HOUSING EQUITY IS ANNUITIZED AT 65)

Birth Cohort/Income Quartiles
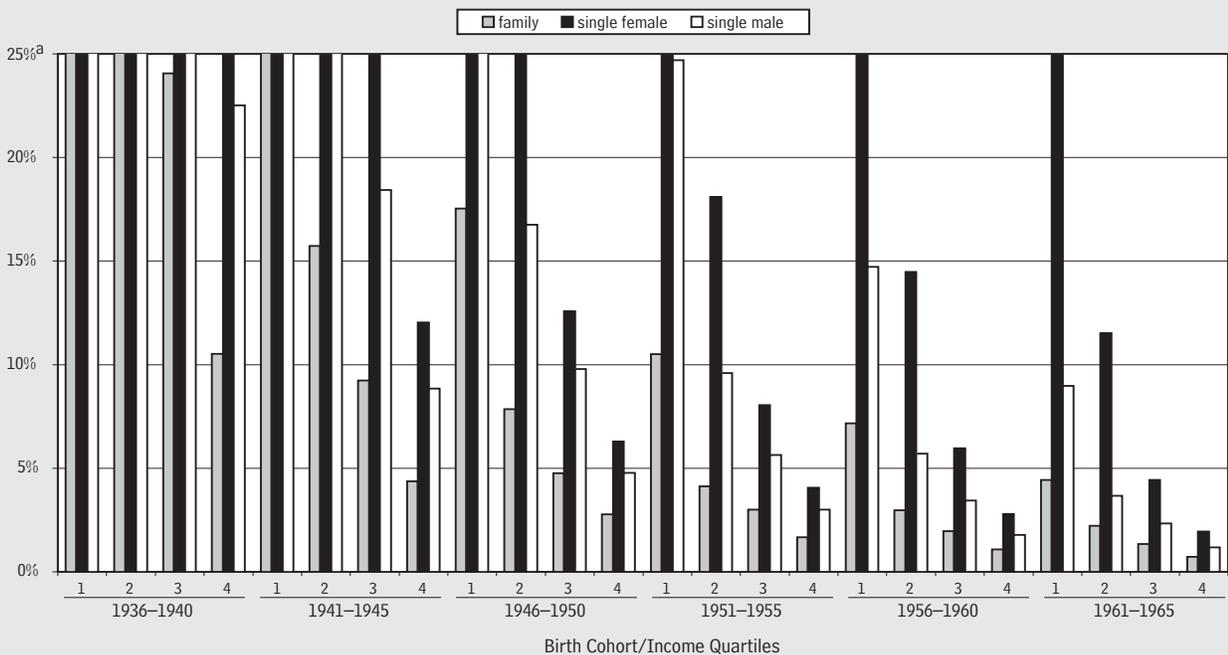
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

Combinations of self-reported results were used to initialize IRA accounts. Future IRA contributions were modeled from SIPP data, while future rollover activity was assumed to flow from future separation from employment in those cases in which the employee was participating in a defined contribution plan sponsored by the previous employer. Industry data are used to estimate the relative likelihood that the balances are rolled over to an IRA, left with the previous employer, transferred to a new employer, or used for other purposes.

Defined Benefit Plans

A stochastic job duration algorithm was estimated and applied to each individual in the EBRI-ERF model to predict the number of jobs held and age at each job change. Each time the individual starts a new job, the EBRI-ERF model simulates whether or not it will result in coverage in a defined benefit plan, a defined contribution plan, both, or neither. If coverage in a defined benefit plan is predicted, time series information from the Bureau of Labor Statistics (BLS) is used to predict what type of plan it will be.[4]

While the BLS information provides significant detail on the generosity parameters for defined benefit plans, preliminary analysis indicated that several of these provisions were likely to be highly correlated (especially for integrated plans). Therefore, a time series of several hundred defined benefit plans per year were coded to allow for assignment to the individuals in the EBRI-ERF model.[5]

Although the Tax Reform Act of 1986 at least partially modified the constraints on integrated pension plans by adding Sec. 401(l) to the Internal Revenue Code, it would appear that a significant percentage of defined benefit sponsors have retained Primary Insurance Amount (PIA)-offset plans. In order to estimate the offset provided under the plan formulae, the EBRI-ERF model computes the employee's Average Indexed Monthly Earnings, Primary Insurance Amount, and covered compensation values for the birth cohort.

Defined Contribution Plans

Initial Account Balances—Previous studies on the EBRI/ICI Participant-Directed Retirement Plan Data Collection Project have analyzed the average account balances for 401(k) participants by age and tenure. Recently published results[6] show that the year-end 1999 average balance ranged from $4,479 for participants in their 20s with less than three years of tenure with their current employer to $198,595 for participants in their 60s who have been with the current employer for at least 30 years (thereby effectively eliminating any capability for IRA rollovers).

Unfortunately, the EBRI/ICI database does not currently provide detailed information on other types of defined contribution plans nor does it allow analysis of defined contribution balances that may have been left with previous employers. The EBRI-ERF model uses self-reported responses for whether an individual has a defined contribution balance to estimate a participation model and the reported value is modeled as a function of age and tenure.

Contribution Behavior—Previous research on employee contribution behavior to 401(k) plans has often been limited by lack of adequate data. This is primarily due to the types of matching formulae utilized by sponsors. While these formulae are often complicated due to the desire of sponsors to provide sufficient incentives to non-highly compensated employees to contribute in order to comply with technical nondiscrimination testing, this complexity makes it virtually impossible to appropriately analyze the employee's behavior if one is forced to observe either aggregate plan data or use information on the plan contribution formulae provided by the participant.

With the exception of studies based on administrative data, employee contribution behavior is typically assumed to be a function of employee demographic data and perhaps an employee's estimate of the employer matching rate or a proxy based on Form 5500 data. However, a significant percentage of the employee contribution behavior appears to be determined by plan-specific provisions. For example, the percentage of

Figure 12

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES REDUCED BENEFITS SOCIAL SECURITY AND HOUSING EQUITY IS NEVER LIQUIDATED)

Birth Cohort/Income Quartiles
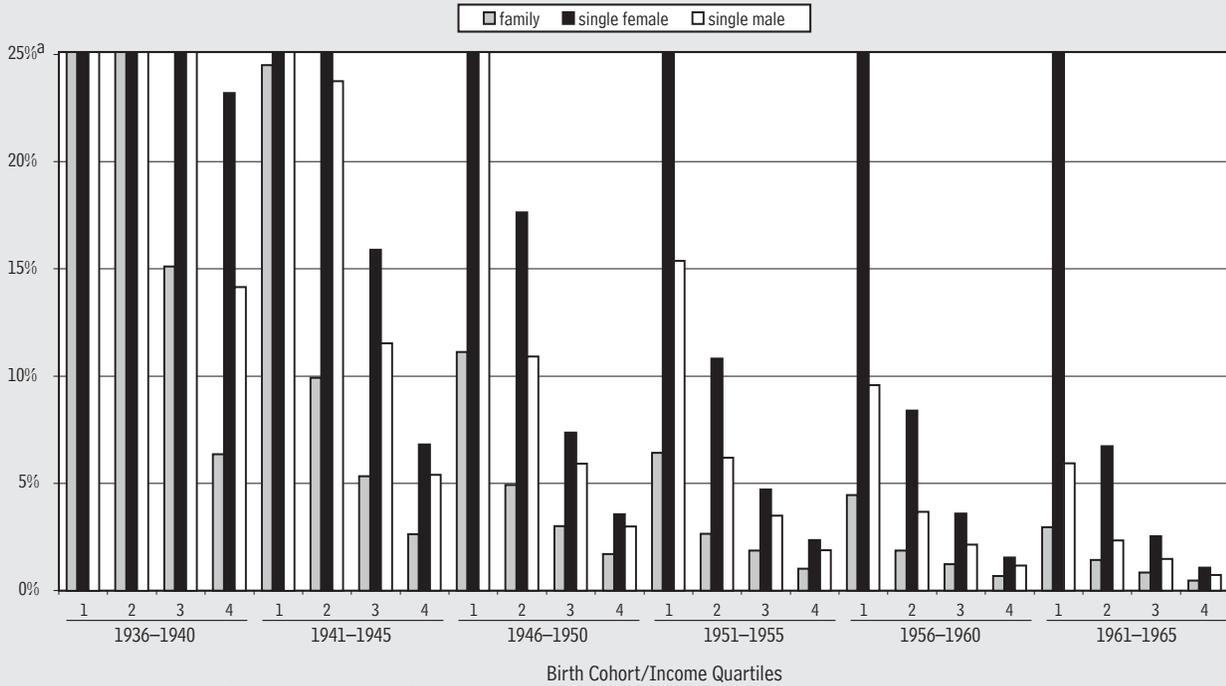
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

Figure 13

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(ASSUMES REDUCED BENEFITS SOCIAL SECURITY AND HOUSING EQUITY IS NEVER LIQUIDATED)

Birth Cohort/Income Quartiles
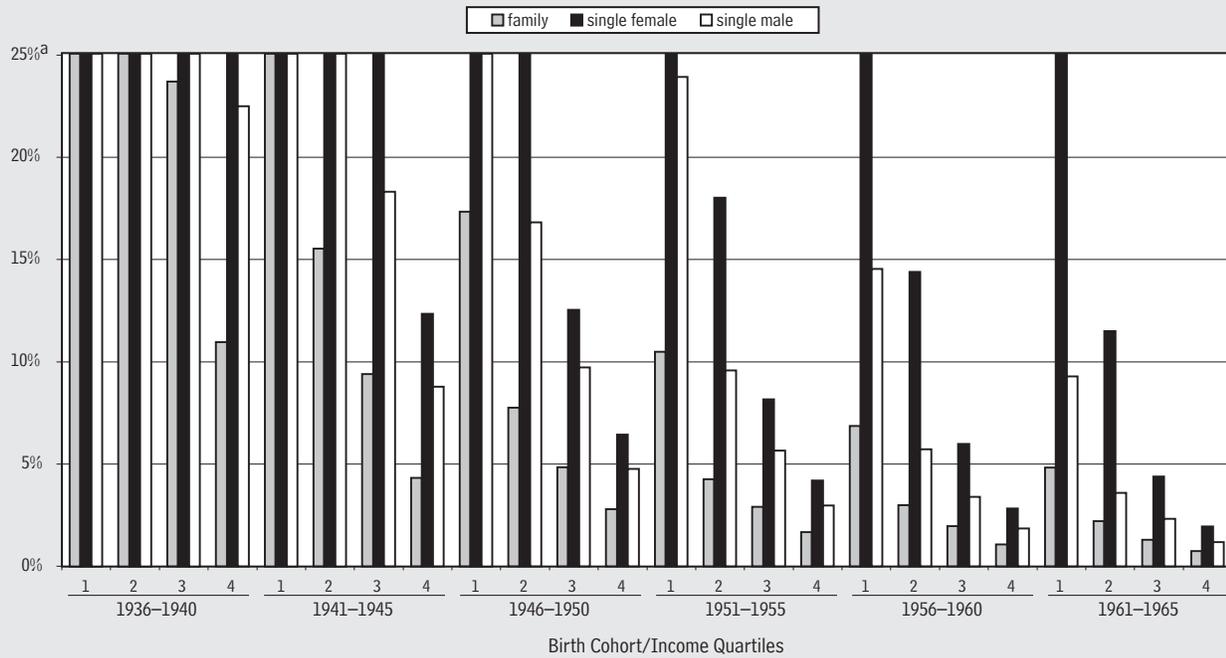
Source: EBRI-ERF Retirement Security Projection Model.

[a] 25% = 25% or more.

employees contributing up to either the maximum amount of compensation matched, the 402(g) limit, or the plan maximum was studied by EBRI in 1996. It would appear that well over 50 percent of the employee contribution is explained by these "corner points" which would not be picked up in the data described above.

Recently, EBRI provided preliminary findings[7] introducing new methodology to expand the usefulness of modeling these data, as well as a better understanding of contribution behavior by 401(k) plan participants. We utilize a sequential response regression model to allow for the differing incentives faced by the employees at various levels of contributions. Based on findings from 137 distinct matching formulae, we have estimated a behavioral model that is able to control for the tendency of employers to substitute between the amount they match per dollar of employee contribution and the maximum percentage of compensation they are willing to match. We decompose employee contribution behavior into a series of 1 percent of compensation intervals and therefore are able to model not only the marginal incentives to contribute at that interval but also the "option value" that making the contribution at that interval provides for the employee.

Contribution behavior for defined contribution plans other than 401(k) plans is estimated from self-reported responses to public survey data.

Investment Returns—Although the EBRI-ERF model has been designed to generate investment rates of return on a stochastic basis, for purposes of this analysis we are presenting the results obtained from running it in a deterministic mode. We adopt the same asset-specific rates of return that were used in the Social Security Administration's Model of Income in the Near Term (MINT) model.[8]

Additional Assumptions For Retirement Income

Projecting Social Security Benefits

Three different Social Security scenarios are used to estimate the Social Security benefit levels of the total retirement income. Each of the scenarios under the intermediate assumptions within the 2000 Social Security Trustee's Report meet the 75-year actuarial balance standard established by Congress. The estimates are generated from the SSASIM policy simulation model. This model is able to replicate actuarial balance and benefit estimates of the Social Security actuaries' model. In addition, SSASIM allows for the changing of numerous policy parameters, including the normal retirement age, the PIA factors, and the Old Age and Survivors Insurance (OASI) and Disability Insurance (DI) tax rates.

Given the projected financial condition of the Social Security program,[9] we ran two reform scenarios designed to ensure 75-year solvency of the program. Under the first alternative, benefits were reduced.[10] Under the second alternative, both the Social Security normal retirement age and the tax rates were increased.[11]

Housing

Although it is not clear from the literature that retirees can be counted on to liquidate this source of wealth, we simulated whether households would be expected to have net housing equity at retirement, and if so, its expected value. Under the baseline scenario, we assumed that retirees would not use their net housing equity to supplement their retirement income in any way (including housing equity loans). Our second scenario assumed any net housing equity is annuitized at retirement.

Figure 14
PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(INCREASED TAXES/NRA[a] SOCIAL SECURITY AND HOUSING EQUITY IS NEVER LIQUIDATED)

Birth Cohort/Income Quartiles
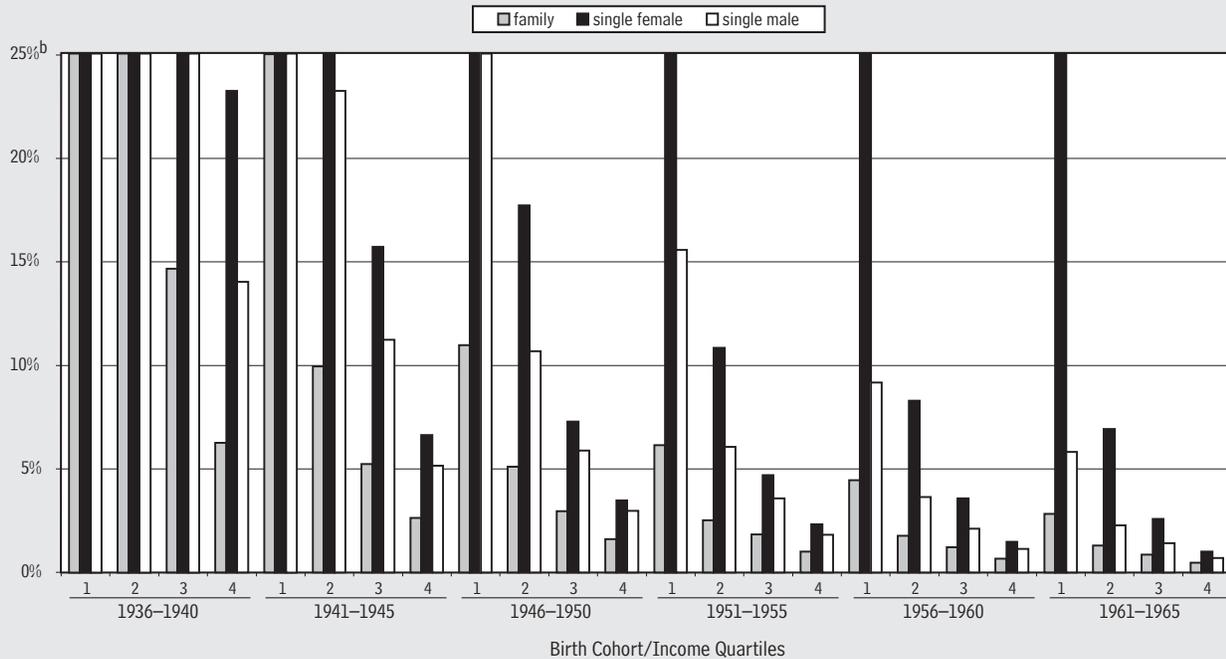
Source: EBRI-ERF Retirement Security Projection Model.
[a] Normal retirement age.
[b] 25% = 25% or more.

Figure 15
PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(INCREASED TAXES/NRA[a] SOCIAL SECURITY AND HOUSING EQUITY IS NEVER LIQUIDATED)

Birth Cohort/Income Quartiles
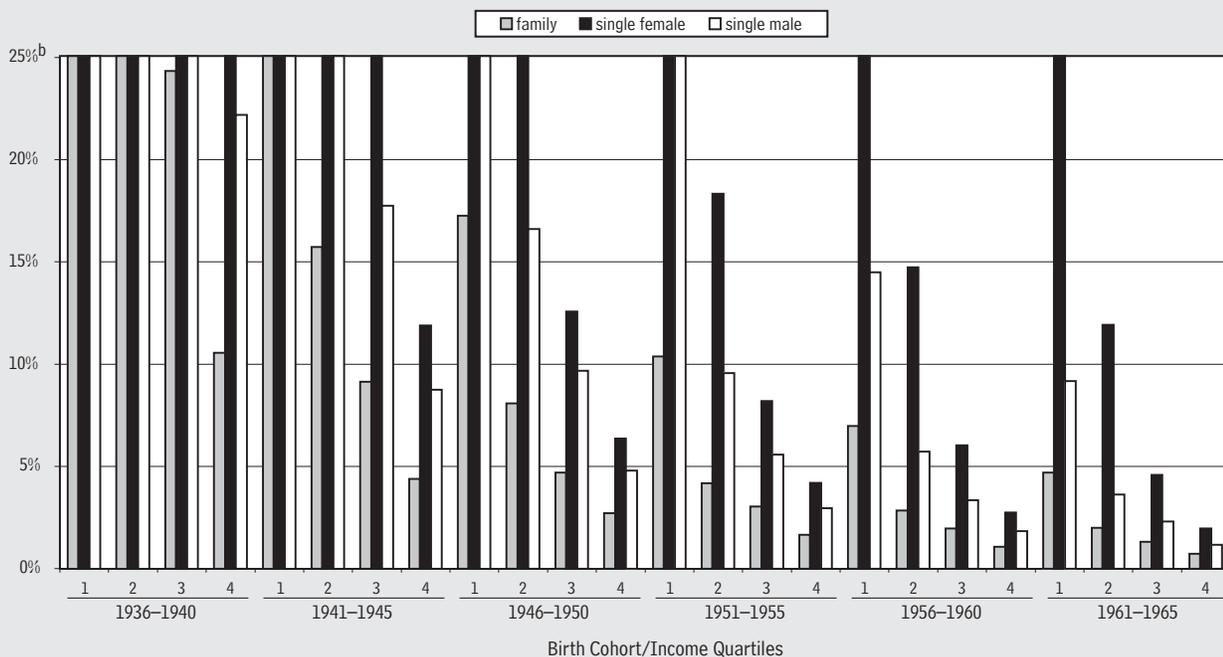
Source: EBRI-ERF Retirement Security Projection Model.
[a] Normal retirement age.
[b] 25% = 25% or more.

Given the stochastic nature of the analysis we were also able to model a third scenario where we assume that housing equity is not liquidated until the time it is first needed to mitigate an annual deficit. At that point we assume any residual value is invested in the same manner as an individual account retirement plan.

Expenditure Assumptions

The expenditures used in the model for the elderly consist of two components—deterministic and stochastic expenses. The deterministic expenses include those expenses that the elderly incur from a basic need or want of daily life, while the stochastic expenses in this model are exclusively health-event related—e.g., an admission to a nursing home or the commencement of an episode of home health care—that occur only for a portion, if ever, during retirement, not on an annual basis.

Deterministic Expenses

The deterministic expenses are broken down into seven categories—food, apparel and services (dry cleaning, haircuts), transportation, entertainment, reading and education, housing, and basic health expenditures. Each of these expenses is estimated for the elderly (65 or older) by family size (single or couple) and family income (less than $15,000, $15,000 to $29,999, and $30,000 or more in 2002 dollars) of the family/individual.

The estimates are derived from the 2000 Consumer Expenditure Survey (CES) conducted by the Bureau of Labor Statistics of the U.S. Department of Labor. The survey targets the total noninstitutionalized population (urban and rural) of the United States and is the basic source of data for revising the items and weights in the market basket of consumer purchases to be priced for the Consumer Price Index. CES data provide detailed data on expenditures and income of consumers, as well as the demographic characteristics of those consumers. The survey does not provide state estimates, but it does provide regional estimates. Thus, the estimates are broken down into four regions—Northeast, Midwest, South, and West—to account for the differences in the cost of living across various parts of the country.[12] Consequently, an expense value is calculated using actual experience of the elderly for each region, family size, and income level by averaging the observed expenses for the elderly within each category meeting the above criteria. The housing expenses are further broken down by whether the elderly own or rent their home. The basic health expenditure category has additional data needs besides just the CES.

Health—The basic health expenditures are estimated using a somewhat different technique and are comprised of two parts. The first part uses the CES as above to estimate the elderly's annual health expenditures that are paid out-of-pocket or are not reimbursed (covered) or at least not fully reimbursed by Medicare and/or private Medigap health insurance, e.g., prescription drugs.

The second part contains insurance premium estimates, including Medicare Part B premiums, and is not income related. All of the elderly are assumed to participate in Part B, and the premium is determined annually by the Medicare program and is the same nationally. For the Medigap insurance premium, we assume all of the elderly purchase a Medigap policy. A regional estimate is derived from a 2000 survey done by Weiss Ratings Inc. that received average quotes for three popular types of Medigap policies (A, F, and J) in 47 states and the District. The estimates are calculated from the three policy types averaged over the states in the respective regions to arrive at the estimate for each region.

This approach is taken for two reasons. First, sufficient quality data do not exist for the matching of retiree medical care (as well as the generosity of and cost of the coverage) and Medigap policy use to various characteristics of the elderly. Second, the health status

Figure 16

Percentage of Added Compensation That Must Be Saved Annually Until Retirement For a 75% Chance of Covering Basic Retirement Expenses
(increased taxes/NRA[a] Social Security and housing equity is annuitized at 65)
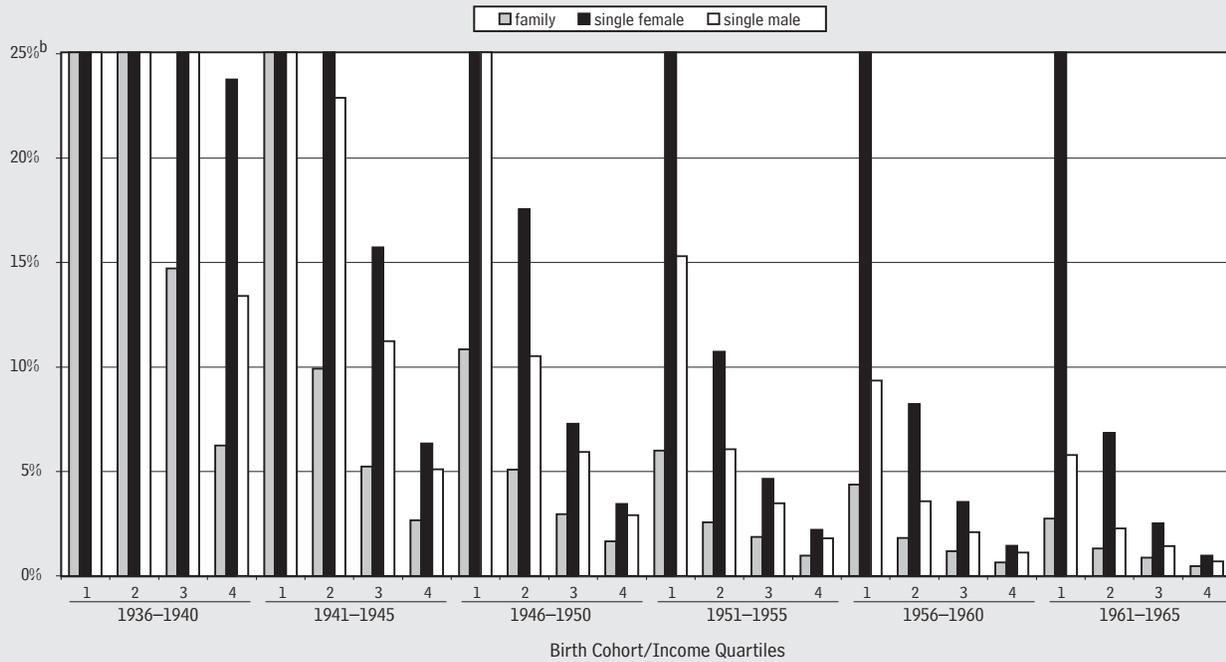
Birth Cohort/Income Quartiles

Source: EBRI-ERF Retirement Security Projection Model.
[a] Normal retirement age.
[b] 25% = 25% or more.

Figure 17

Percentage of Added Compensation That Must Be Saved Annually Until Retirement For a 90% Chance of Covering Basic Retirement Expenses
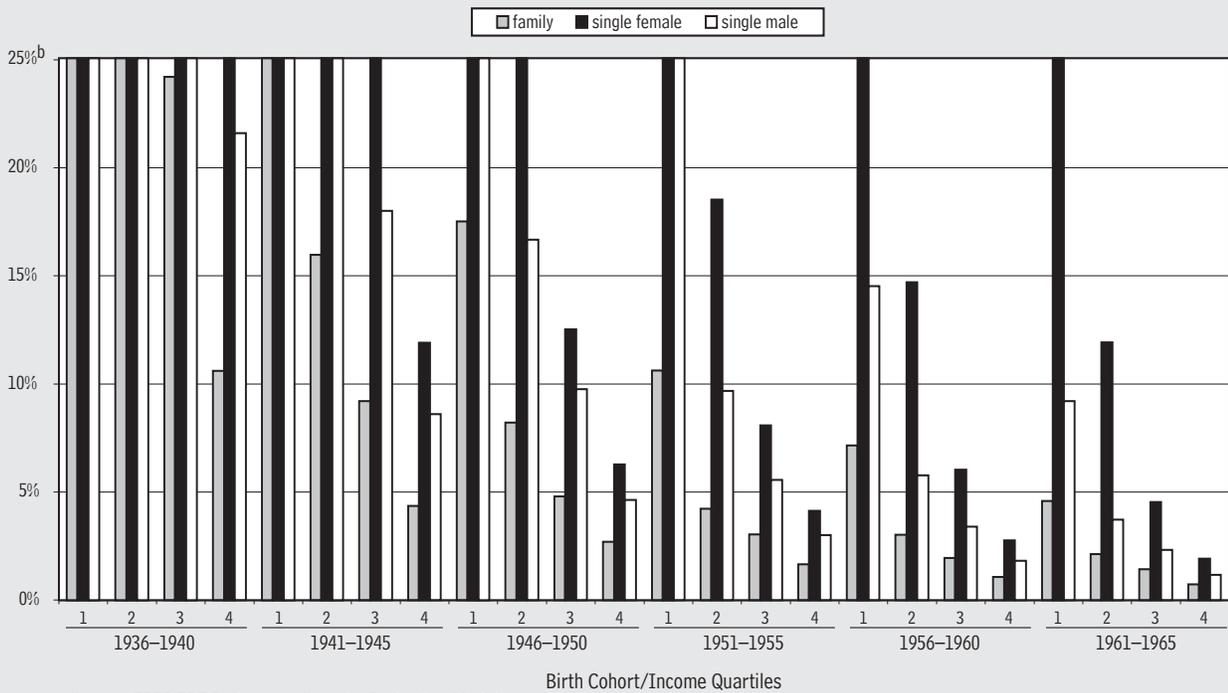(increased taxes/NRA[a] Social Security and housing equity is annuitized at 65)

Birth Cohort/Income Quartiles

Source: EBRI-ERF Retirement Security Projection Model.
[a] Normal retirement age.
[b] 25% = 25% or more.

of the elderly at the age of 65 is not known, let alone over the entire course of their remaining life. Thus, by assuming everyone has a standard level of coverage eliminates trying to differentiate among all possible coverage types as well as determining whether the sick or healthy have the coverage. Therefore, averaging of the expenses over the entire population should have offsetting effects in the aggregate.

The total deterministic expenses for elderly individuals or families is then the sum of the value in all the expense categories for family size, family income level, and region of the individual or family. These expenses make up the basic annual (recurring) expenses for the individual or family. However, if the individual or family meet the income and asset tests for Medicaid, Medicaid is assumed to cover the basic health care expenses (both parts), not the individual or family. Furthermore, Part B premium relief for the low-income elderly (not qualifying for Medicaid) is also incorporated.

Stochastic Expenses

The second component of health expenditures is the result of simulated health events that would require long-term care in a nursing home or home-based setting for the elderly. Neither of these simulated types of care would be reimbursed by Medicare because they would be for custodial (not rehabilitative) care. The incidence of the nursing home and home health care and the resulting expenditures on the care are estimated from the 1999 National Nursing Home Survey (NNHS) and the 2000 National Home and Hospice Care Survey (NHHCS). NNHS is a nationwide sample survey of nursing homes, their current residents and discharges that was conducted by the National Center for Health Statistics from July through December 1999. The NHHCS is a nationwide sample survey of home health and hospice care agencies, their current and discharge patients that was conducted by the National Center for Health Statistics from August through December 2000.

For determining whether an individual has these expenses, the following process is undertaken. An individual reaching the Social Security normal retirement age has a probability of being in one of four possible assumed "health" statuses:

1) Not receiving either home health or nursing home care,
2) Home health care patient,
3) Nursing home care patient,
4) Death,

based upon the estimates of the use of each type of care from the surveys above and mortality. The individual is randomly assigned to each of these four categories with the likelihood of falling into one of the four categories based upon the estimated probabilities of each event. If the individual does not need long-term care, no stochastic expenses are incurred. Each year, the individual will again face these probabilities (the probabilities of being in the different statuses will change as the individual becomes older after reaching age 75 then again at age 85) of being in each of the four statuses. This continues until death or the need for long-term care.

For those that have a resulting status of home health care or nursing home care, their duration of care is simulated based upon the distribution of the durations of care found in the NNHS and NHHCS. After the duration of care for a nursing home stay or episode of home health care, the individual will have a probability of being discharged to one of the other three statuses based upon the discharge estimates from NNHS and NHHCS, respectively. The stochastic expenses incurred are then determined by the length of the stay/number of days of care times the per diem charge estimated for the nursing home care and home health care, respectively, in each region.

For any person without the need for long-term care, this process repeats annually. The process repeats for individuals receiving home health care or nursing home care at the end of their duration of stay/care and subsequently if not receiving the specialized care again at their next birthday. Those who are simulated to die, of

Figure 18

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 75% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
(INCREASED TAXES/NRA[a] SOCIAL SECURITY AND HOUSING EQUITY IS LIQUIDATED AS NEEDED)
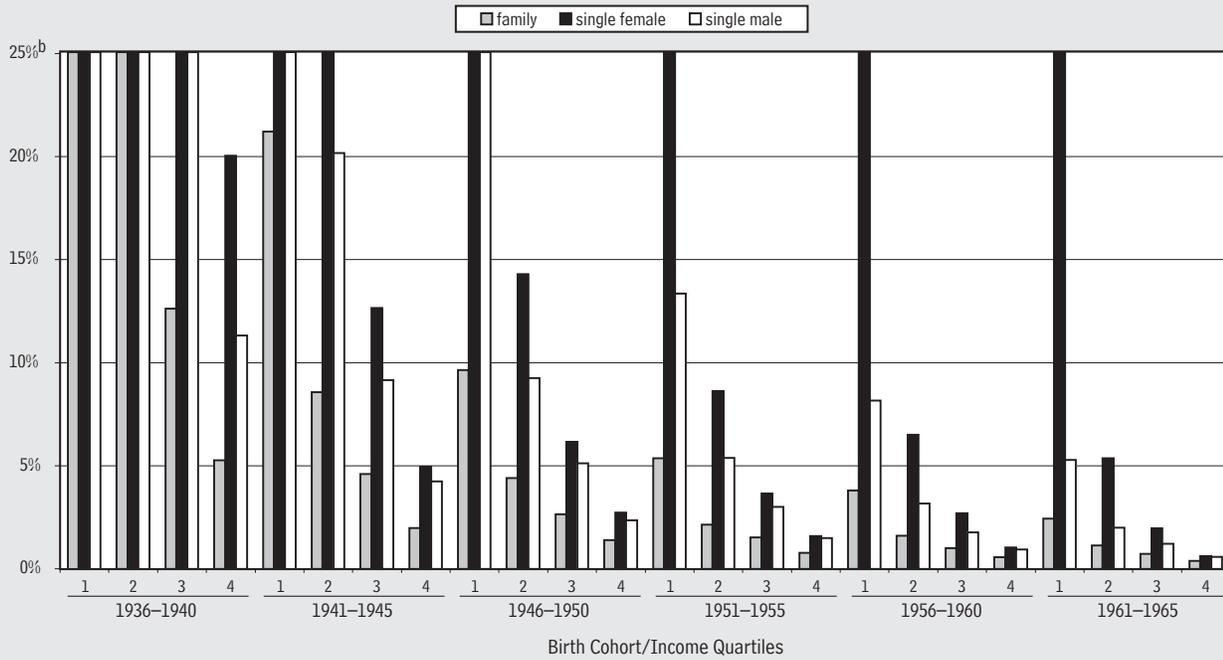
Source: EBRI-ERF Retirement Security Projection Model.
[a] Normal retirement age.
[b] 25% = 25% or more.

Figure 19

PERCENTAGE OF ADDED COMPENSATION THAT MUST BE SAVED ANNUALLY UNTIL RETIREMENT FOR A 90% CHANCE OF COVERING BASIC RETIREMENT EXPENSES
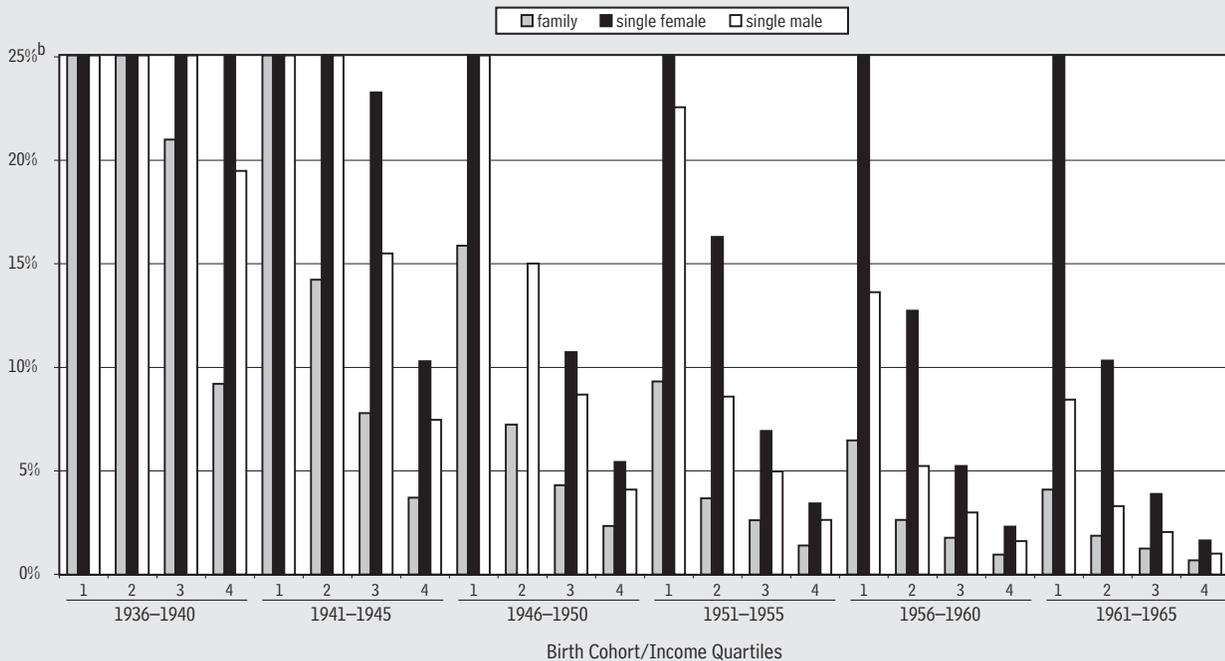(INCREASED TAXES/NRA[a] SOCIAL SECURITY AND HOUSING EQUITY IS LIQUIDATED AS NEEDED)

Source: EBRI-ERF Retirement Security Projection Model.
[a] Normal retirement age.
[b] 25% = 25% or more.

course, are not further simulated.

As with the basic health care expenses, the qualification of Medicaid by income and asset levels is considered to see how much of the stochastic expenses must be covered by the individual to determine the individual's final expenditures for the care. Only those expenditures attributable to the individual—not the Medicaid program—are considered as expenses to the individual and as a result in any of the "deficit" calculations.

Total Expenditures

The elderly individual or families' expenses are then the sum of their assumed deterministic expenses based upon their demographic characteristics plus any simulated stochastic expenses that they may have incurred. In each subsequent year of life, the total expenditures are again calculated in this manner. The base year's expenditure value estimates excluding the health care expenses are adjusting annually using the assumed general inflation rate of 3.3 percent from the 2001 OASDI Trustees Report, while the health care expenses are adjusted annually using the 4.0 percent medical consumer price index that corresponds to the June 2002–June 2003 level.[13, 14]

Background

Nations around the world are cutting social insurance benefit promises and watching the economic status of the elderly decline. This is the result of the rapid growth of the proportion of the population over age 65, and the unwillingness to raise taxes to finance pay-as-you-go programs. It is also the result of delaying analysis and action.

The United States is 20 years behind other industrialized nations in the aging of its population. There is still time to undertake analysis and to take necessary actions. For government, this would allow smaller changes now, versus bigger changes later. For business, early action increases the likelihood of future retirees having income and assets to spend in this consumer-driven economy. While the nation must face these issues as a whole, they also will present challenges for states and localities, and for public-sector and private-sector decision makers. Yet, analysis of future economic well-being of the retired population at the state level has been very limited due to the unavailability of the necessary data and/or models to perform the analysis.

The Employee Benefit Research Institute and the Milbank Memorial Fund, working with the governor of Oregon, set out to see if this situation could be addressed for Oregon. The results made it clear that major decisions lie ahead if the state's population is to have adequate resources in retirement.

Subsequent to the release of the Oregon study, it was decided that the approach could be carried to other states as well. Kansas and Massachusetts were chosen as the second and third states for analysis. Results of the Kansas study were presented to the state's Long-Term Care Services Task Force on July 11, 2002, and the results of the Massachusetts study were presented on Dec. 1, 2002.

The Employee Benefit Research Institute's Education and Research Fund (EBRI-ERF) Retirement

Figure 20

PERCENTAGE OF RETIREES ESTIMATED TO HAVE SUFFICIENT RETIREMENT INCOME/WEALTH BY SAVING 5% OF COMPENSATION EACH YEAR FROM 2003 UNTIL RETIREMENT
(ASSUMES CURRENT SOCIAL SECURITY BENEFITS)

Birth Cohort/Income Quartiles
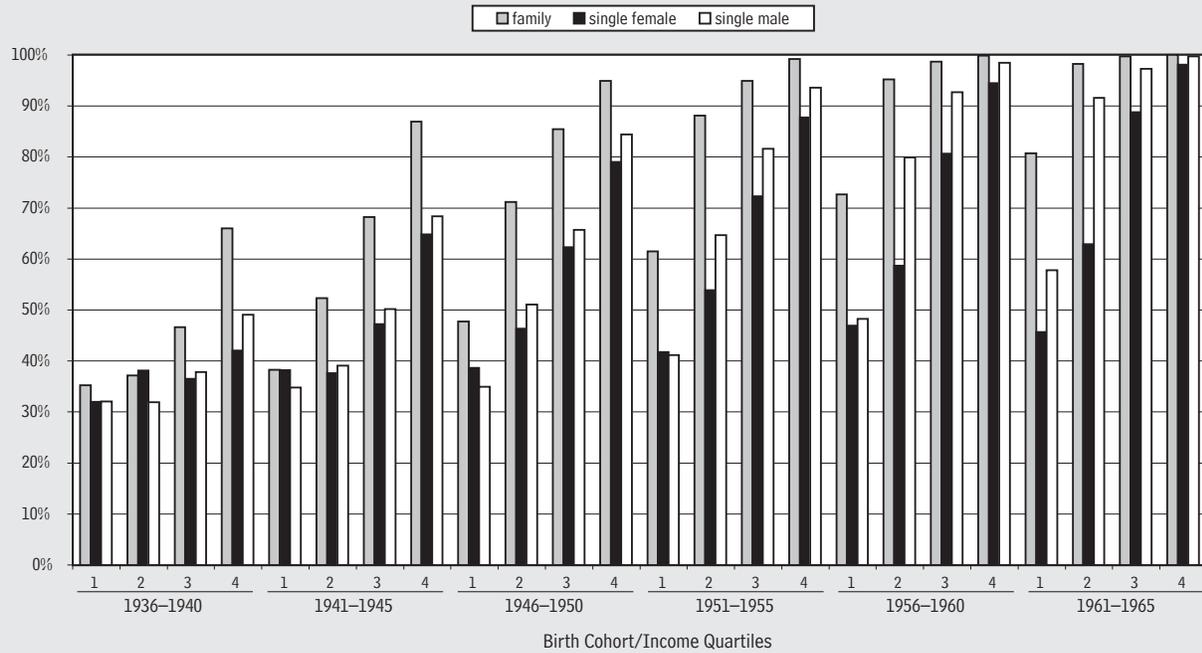
Source: EBRI-ERF Retirement Security Projection Model. Assumes current Social Security and housing equity is never liquidated.

a The model includes the possibility of chronic long-term home health care and nursing home expenses.

Figure 21

PERCENTAGE OF RETIREES ESTIMATED TO HAVE SUFFICIENT RETIREMENT INCOME/WEALTH BY SAVING 5% OF COMPENSATION EACH YEAR FROM 2003 UNTIL RETIREMENT
(ASSUMING REDUCED SOCIAL SECURITY BENEFITS)

Birth Cohort/Income Quartiles
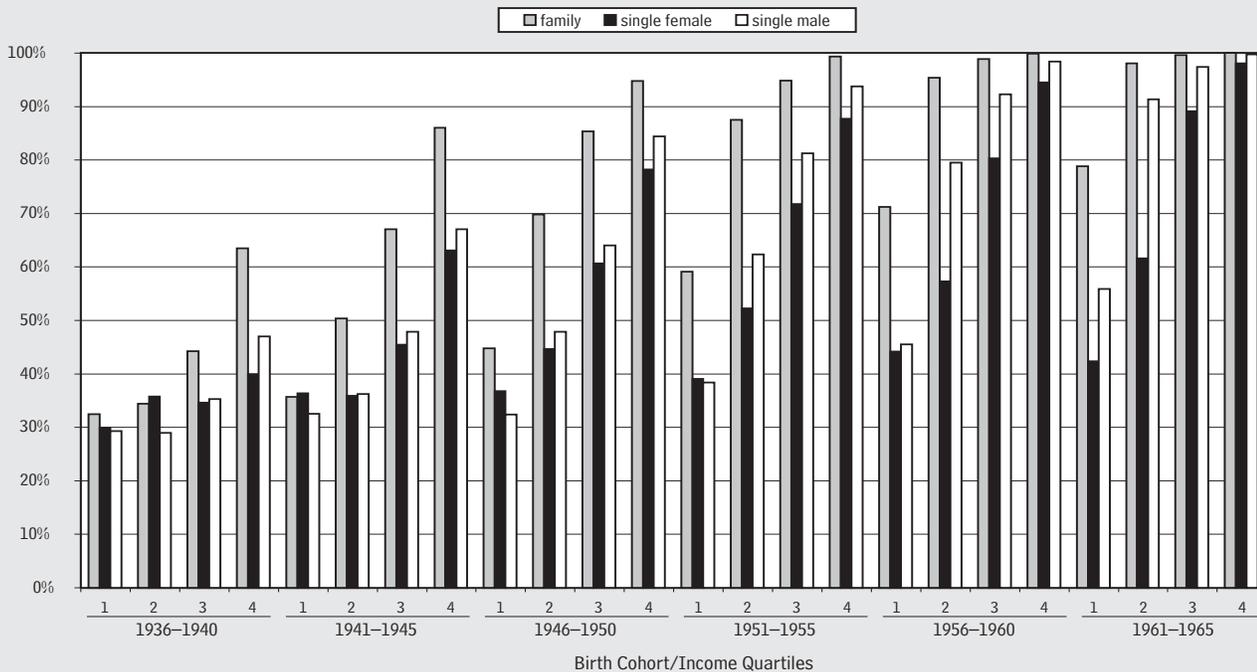
Source: EBRI-ERF Retirement Security Projection Model. Assumes reduced benefits Social Security and housing equity is never liquidated.

a The model includes the possibility of chronic long-term home health care and nursing home expenses.

Security Projection Model was used to estimate the accrued benefits earned and assumed to be retained by defined benefit participants as well as the annual retirement income that could be produced from the balances of any defined contribution plan, cash balance plan, and/or individual retirement account (IRA) of the state's residents at Social Security normal retirement age. We added to this amount the expected retirement income from Social Security under current law as well as under two reform options (described in detail below).

In an attempt to provide an approximation of the aggregate amount of additional money that would be needed to provide basic expenditures, we have estimated the deficits that are likely to be produced by comparing projected retirement income with projected retirement expenses (both deterministic and stochastic) over the simulated lifetime of each future retiree. These deficits approximate the additional money that would be required in addition to the retirement income and wealth already projected from defined benefit and defined contribution retirement plans, IRAs, Social Security, and (under some of the output presented below) liquidation and/or annuitization of housing net worth to cover the projected expenses of maintaining the families' economic standard of living. The present value of any deficits are accumulated annually and then averaged for all retirees in the same birth cohort and gender/family categories.

Previous Studies

While there have been several studies that have attempted to project retirement income and wealth,[15] there have been few attempts to reconcile this with the uncertain amount and duration of retiree expenditures. Moore and Mitchell (1997) estimated how much Health and Retirement Study (HRS) respondents age 51 to 61 would need to save from the current year until retirement assuming they wanted to preserve preretirement consumption levels after retirement. They found that the savings requirement for the median family would be 7 percent of compensation if the retirement age was 65. As expected, they found tremendous heterogeneity among families with respect to the required savings rate.

Another approach was followed by Engen, Gale, and Uccello (1999) using both HRS and the Survey of Consumer Finances (SCF). Using a theoretical model, the authors estimated the ratio of a household's wealth to its earnings as benchmarks to evaluate savings adequacy. Using intermediate wealth measures, the authors estimated that 59.7 percent of the SCF households exceeded the simulated median wealth-to-earnings ratio in 1992. While this model includes the capacity for sensitivity analysis on an ad-hoc increase in simulated retirement needs and/or life expectancy, there is no attempt to empirically estimate the incidence, duration or cost of potentially catastrophic medical costs.

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Endnotes

[1] The basic level of expenditures for each family is determined by the level of income that their accumulated retirement account and program wealth can produce annually assuming they live to their average life expectancy plus five years. This basic level is by no means necessarily equivalent to their pre-retirement expenditures but in many cases significantly above the poverty threshold. These expenditures include food, apparel and services, transportation, housing, health, entertainment, and reading and education. The basic expenditure levels increase with retirement income in relation to the following thresholds: less than $15,000, $15,000 to $29,999, and $30,000 or more (in 2000 dollars).

[2] This provides a comparison at the 75 percent confidence level. The impact at the 90 percent confidence level may be obtained by comparing Figure 13 with Figure 3.

[3] This provides a comparison at the 75 percent confidence level. The impact at the 90 percent confidence level may be obtained by comparing Figure 15 with Figure 3.

[4] The model is currently programmed to allow the employee to participate in a nonintegrated career average plan; an integrated career average plan; a five-year final average plan without integration; a three-year final average plan without integration; a five-year final average plan with covered compensation as the integration level; a three-year final average plan with covered compensation as the integration level; a five-year final average plan with a PIA offset; a three-year final average plan with a PIA offset; a cash balance plan; or a flat benefit plan.

[5] BLS information was utilized to code the distribution of generosity parameters for flat benefit plans.

6 Sarah Holden and Jack VanDerhei, "401(k) Plan Asset Allocation, Account Balances, and Loan Activity in 1999," *EBRI Issue Brief* no. 230 (Employee Benefit Research Institute, February 2001).

7 Jack VanDerhei and Craig Copeland, "A behavioral model for predicting employee contributions to 401(k) plans." North American Actuarial Journal (First Quarter, 2001).

8 MINT assumes a CPI growth rate of 3.50 percent, a real rate of return for stocks of 6.98 percent, and a real rate of return for bonds of 3.00 percent. It subtracts 1 percent from each of the stock and bond real rates of return to reflect administrative cost (See Eric Toder et al., Modeling Income in the Near Term: Projections of retirement Income Through 2020 for the 1931–1960 Birth Cohorts, Final Report, SSA Contract No: 600-96-27332 (Washington, DC: The Urban Institute, 1999).

9 The present Social Security program has been shown to be financially unsustainable in the future without modification to the current program. For additional detail, see Craig Copeland, Jack VanDerhei, and Dallas Salisbury, "Social Security Reform: Evaluating Current Proposals," *EBRI Issue Brief*, no. 210 (Employee Benefit Research Institute, June 1999).

10 This scenario involves gradually reducing the benefits of those starting to receive retirement and survivor's benefits. The reduction starts immediately and reaches 10 percent of present law benefits in 2010, 15 percent in 2016, and 22 percent in 2022.

11 Under this reform alternative, the normal retirement age continues its increase from 65 to 67 but at a faster pace than under current law. Thereafter, the normal retirement age is indexed to longevity (currently assumed to be one month every two years). An increase from 10.6 percent to 12.35 percent in 2030 and to 13.50 percent in 2050 of the OASI tax rate completes the proposal.

12 The Northeast region includes the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. The Midwest region includes the states of Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. The South region includes the states of Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas; while the West region includes the states of Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and Hawaii.

13 The 2003 OASDI Trustees report subsequently reduced the assumed general inflation rate to 3.0 percent. The actuaries at the Center for Medicare & Medicaid Services developed a personal health care chain-type index that is a composite index of health care prices in the overall health care economy, which they predict will rise at a 3.5 percent level annually from 2004–2008 and 3.9 percent annually from 2009–2012.

14 While the medical consumer price index only accounts for the increases in prices of the health care services, it does not account for the changes in the number and/or intensity of services obtained. Thus, with increased longevity, the rate of health care expenditure growth will be significantly higher than the 4.0 percent medical inflation rate, as has been the case in recent years.

15 Wolff (2002) argues that, among near-retirees in 1998, only those with wealth holdings above $1 million saw consistent increases in retirement wealth (after inflation) compared with their counterparts in 1983. However, this study fails to project defined contribution plan balances at retirement, whereas it does project the present value of Social Security and defined benefit plan benefits at retirement.

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