

**Testimony for the
House Education and Labor Committee**

*The Impact of the Financial Crisis
on Workers' Retirement Security*

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2175 Rayburn HOB, Washington, DC

Presented by:

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Impact of the Current Financial Crisis on Retirement Security

By Jack VanDerhei, EBRI

Mr. Chairman and members of the committee, thank you for your invitation to testify today on the impact of the financial crisis on retirement security. I am Jack VanDerhei, research director of the Employee Benefit Research Institute. EBRI is a nonpartisan research institute that has been focusing on retirement and health benefits for the past 30 years. EBRI does not take policy positions and does not lobby.

Although there is no clear definition of the time period for the “current financial crisis,” this testimony defines it as the first nine months of 2008. During that time, major equity indexes were negative, with the S&P 500 Index losing 19.29 percent. Fixed-income investments fared much better during this period, with the Lehman Aggregate Index gaining 0.63 percent and three-month T-bills gaining 1.54 percent.

The impact of the current financial crisis on defined benefit (pension) plans is impossible to quantify, but it is obvious that a marked reduction in funding ratios and/or increase in volatility may make continued sponsorship of these plans less attractive under some forms of pension accounting modifications. Moreover, the Pension Protection Act of 2006 (PPA) has established specific restrictions with respect to freezing of accruals, plan amendments and lump-sum distributions as a function of funding ratios. Recent estimates from Watson Wyatt projected that pension plans would be 84 percent funded as of Sept. 24, down from 91 percent in the second quarter.¹

Considerably more is known about the immediate impact of the current financial crisis on defined contribution plan (primarily 401(k)) participants. It should be emphasized that while older employees have average equity allocations that are lower than their younger counterparts (and hence are thought by some to be less vulnerable to negative returns in the equity markets), their average account balances are significantly larger and therefore have more to lose in a significant downturn.

Research has shown that a worker’s age is a major factor in his or her ability to recover from an economic downturn. Holden and VanDerhei (2002) simulated the likely impact of a major bear market—defined as three consecutive years of a –9.3 percent annual return—on the overall (nominal) replacement rates that could be provided by “401(k) accumulations” as a function of when the downturn occurred during the employee’s tenure with the plan sponsor.

Based on a median replacement rate of about 51 percent of final income, the modeled three-year downturn would result in a lower replacement rate for 401(k) participants in the lowest-income quartile of only –3.2 percentage points at the beginning of their career, or –7.5 percentage points for those in mid-career (ages 39–41), or –13.4 percent for those at the end of their career.²

However, building and/or modifying a simulation model that is able to quantify the likely impact of a market downturn on eventual retirement income is a lengthy process. Consequently, attention is typically focused on how a decline in the financial markets has impacted the average defined contribution plan balances. For purposes of this testimony, EBRI has taken the most recent information in the EBRI/ICI 401(k) database (year-end 2006) and used employee-specific information as well as financial market indexes³ to estimate the percentage change in average account balances among the 2.2 million

¹ “DB plan funding and DC allocations steady,” *Pensions and Investments*, Sept. 29, 2008.

² For 401(k) participants in the highest income quartile, the median replacement rate decreased by 3.7 percentage points if the market downturn would occur at the beginning of the career. The decrease was estimated to be 10.4 percentage points if it took place at the middle of the career. If the market downturn took place at the end of the career, the estimated decrease was 17.7 percent. These percentage point decreases for this group were based on a median replacement rate of 67.2 percent of final income, assuming a regular stochastic simulation of equity returns.

³ For purposes of this analysis, investment returns were proxied by one of the following three index returns: S&P 500 Index, Lehman Aggregate Index or three-month T-bills. These asset classes were assumed to have fees of 45, 45 and 75 basis points, respectively.

401(k) participants present from year-end 1999 through year-end 2006, by age and tenure for three different periods:

- January 1, 2008, through October 1, 2008 (Figure 1);
- January 1, 2007, through October 1, 2008 (Figure 2); and
- January 1, 2000, through October 1, 2008 (Figure 3).

This “consistent sample” of 401(k) participants was created several years ago in the annual analysis of EBRI/ICI 401(k) data to provide an estimate of changes in average annual account balances that was not biased downward by job turnover of 401(k) participants.

For this analysis, contributions in 2007 and the first nine months of 2008 were assumed to be equal to the participant’s 2006 contributions, adjusted for changes in average national wage during that period. Loan and withdrawal behavior were estimated based on 2006 experience for similar employees. These estimates will be biased if asset allocation of current contributions, or contribution, loan or withdrawal behavior has changed since 2006 (presumably in response to the fluctuations in the financial markets).

However, Hewitt Associates, LLC, has recently stated that participants “appear to be taking a long-term investment strategy for their 401(k) retirement assets by choosing an asset allocation and staying with it,” and that net transfer activity was “consistently low.”⁴ Fidelity has also reported that participants did not increase their borrowings from 401(k) accounts in 2007 and the first half of 2008.⁵ However, hardship withdrawals are on the rise in the first half of 2008 compared with the first half of 2007.⁶

Figure 1 shows that for the first nine months of 2008, the percentage loss in average account balances among 401(k) participants in the consistent sample varies from a low of –7.2 percent for the oldest cohort (age 56–65 in 2006) with the shortest tenure with the 401(k) sponsor (six to 10 years in 2006), to a high of –11.2 percent for the youngest cohort with 21–30 years of tenure. The reason that this particular group has the lowest average loss is a function of the reduced equity exposure they take (on average), as well as the larger ratio of contributions to account balance given their relatively short tenure. The group with the largest average loss is those young enough to still have a relatively large equity exposure in their accounts, compared with the others in the long-tenure cohort.

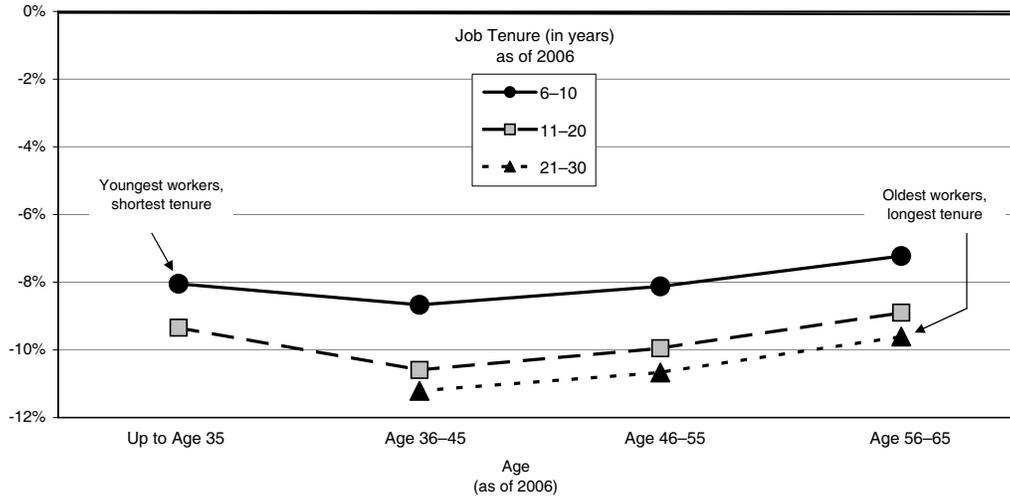
Figure 3 broadens the time span under analysis and shows that, even with the financial market setback suffered so far in 2008, the percentage change in average account balances from January 1, 2000, through October 1, 2008, was significantly positive for all groups and all age cohorts in the two shortest-tenure categories to have at least doubled their account balances (in nominal terms). The largest increase was again experienced by the group with the youngest workers and shortest tenure (706 percent), in large part due to greater weight of their contributions as compared with investment earnings or losses. Those having the lowest increase were the oldest workers with the longest tenure (55 percent); however this number needs to be interpreted carefully in light of the ability of many employees to start taking in-service distributions from their plans at age 59-½.

⁴ “DB plan funding and DC allocations steady,” *Pensions and Investments*, Sept. 29, 2008.

⁵ *Financial Week*, “Workers swearing off 401(k) loans, says survey,” (Aug. 19, 2008). Online at www.financialweek.com/apps/pbcs.dll/article?AID=/20080819/REG/860878

⁶ *Business Insurance*, “Large Plan Providers Report Drop in 401(k) Loans by Workers – But Hardship Withdrawals on the Rise As Employees Struggle with Economic Difficulties Arising Out of Credit Crisis,” (Sept. 8, 2008). Online at www.businessinsurance.com/cgi-bin/article.pl?articleId=25814&a=a&bt=large+plan+providers

Figure 1
Change in Average Account Balances Among a Consistent Sample of 401(k) Participants, by Age and Tenure,^a Jan. 1, 2008–Oct. 1, 2008



Sources: 1999 and 2006 Account Balances: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project. 2007 and 2008 Account Balances: EBRI estimates. The analysis is based on a consistent sample of 2.2 million participants with account balances at the end of each year from 1999 through 2006.
^a Age and tenure groups are based on participant age and tenure at year-end 2006.

Figure 2
Change in Average Account Balances Among a Consistent Sample of 401(k) Participants, by Age and Tenure,^a Jan. 1, 2007–Oct. 1, 2008



Sources: 1999 and 2006 Account Balances: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project. 2007 and 2008 Account Balances: EBRI estimates. The analysis is based on a consistent sample of 2.2 million participants with account balances at the end of each year from 1999 through 2006.
^a Age and tenure groups are based on participant age and tenure at year-end 2006.

Additional Research Needed to Better Understand How the Financial Crisis is Affecting 401(k) Participants

The primary reason for using the consistent sample as the basis for analysis in the preceding section is the current inability to track workers as they move from one 401(k) sponsor to another, and/or to follow their retirement assets if the 401(k) assets are rolled into an IRA. EBRI is currently in the process of enhancing our research capabilities to allow this kind of data to be captured. This will allow linking of accounts across data providers within our universe of individual account plans, resulting in a more complete and accurate retirement picture—such as measuring the effect of rollovers, multiple accounts, job turnover, account leakage, etc.

Another research topic that is urgently needed to better understand the vulnerability of 401(k) participants to volatility in the equity markets deals with the topic of target date funds. Figure 4 shows for the consistent sample described above the asset allocation distribution of 401(k) participant account balances to “equity” by age, as of December 31, 2006. Equity in this figure is defined as the percentage of the participant’s 401(k) funds in equity funds, company stock and the equity portion of balanced and/or target date funds. The figure shows that 43 percent of young 401(k) participants (those 35 or younger in 2006) have 90 percent or more of their 401(k) assets in equities (broadly defined). Another 15 percent of this cohort have 80–90 percent of their assets allocated in this fashion, and another 11 percent have 70–80 percent allocated to equities.

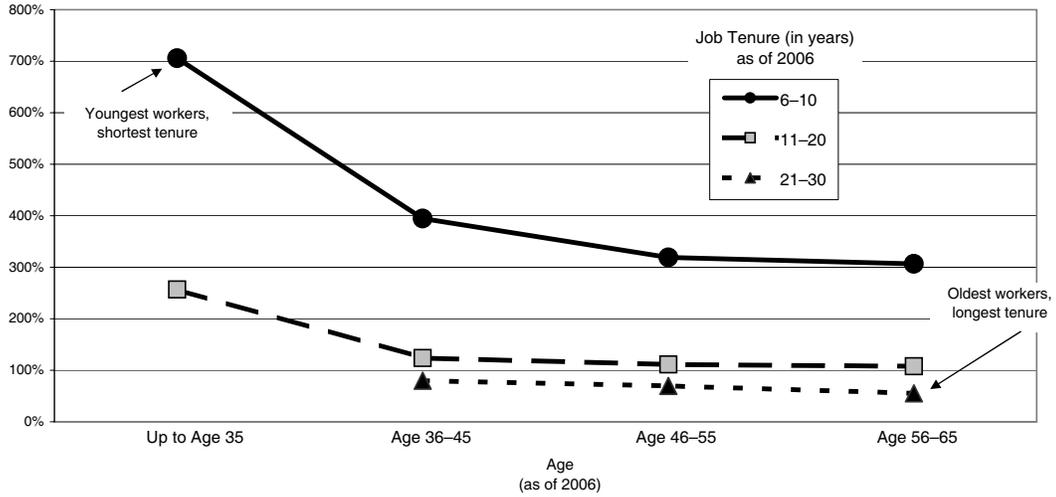
Although many asset allocation models and/or financial advisors may suggest that extreme concentrations to equities for the young cohorts would be acceptable, it is less certain that those approaching retirement would receive similar recommendations. Nevertheless, Figure 4 shows that more than 1 in 4 (27 percent) of the oldest 401(k) participants (age 56–65 in 2006) had 90 percent or more of their 401(k) assets in equities. Another 11 percent had 80–90 percent in equities, and 10 percent had 70–80 percent in equities.

Target date funds with automatic rebalancing and a “glide path” ensuring “age-appropriate” asset allocation are likely to become much more common after full implementation of PPA, with the expected increase in automatic enrollment for 401(k) plans and the attendant interest in QDIAs. Based on unpublished EBRI research, the average equity allocation for target date funds designed for individuals in the 56–65 age range was 51.2 percent at year-end 2006. That would imply that approximately one-half of the consistent sample participants in the age 56–65 age category would have had at least a 20 percent reduction in equities at year-end 2006 if they were allocated 100 percent to target date funds.⁷

EBRI is currently conducting an analysis of target-date funds for defined contribution plans. This project will incorporate three distinct, but interrelated, phases. The first phase will provide an empirical analysis of the use of target-date funds in 401(k) plans. The second phase will focus on a conceptual analysis of the optimal construction of target-date accumulation principles for defined contribution plan participants, including the extension of these principles into the decumulation phase. The third phase will include an empirical analysis of the choice of target-date funds by plan sponsors and correlates with employee demographics and plan design variables. Hopefully, the additional insights generated by this research will assist in providing a more informed asset allocation for those nearing retirement age.

⁷ It is possible that some of these participants were invested in company stock via employer matching contributions that were not able to be diversified.

Figure 3
Change in Average Account Balances Among a Consistent Sample of 401(k) Participants, by Age and Tenure,^a Jan. 1, 2000–Oct. 1, 2008

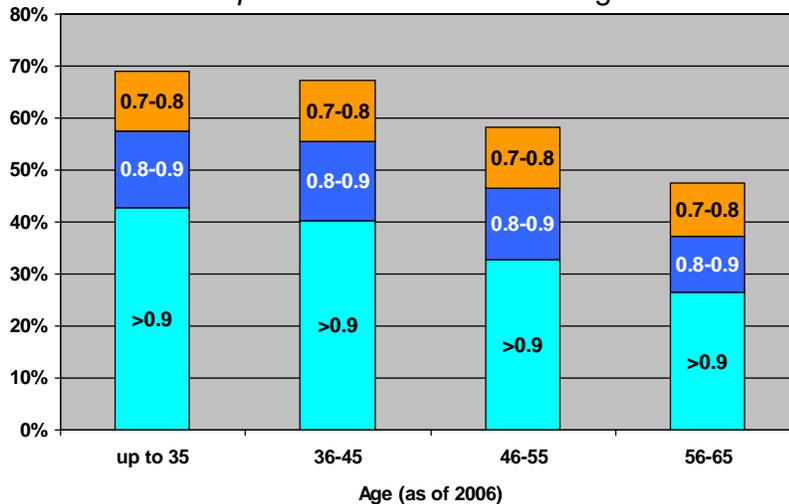


Sources: 1999 and 2006 Account Balances: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project. 2007 and 2008 Account Balances: EBRI estimates. The analysis is based on a consistent sample of 2.2 million participants with account balances at the end of each year from 1999 through 2006.

^a Age and tenure groups are based on participant age and tenure at year-end 2006.

Figure 4
Dec. 31, 2006 Asset Allocation Distribution of 401(k) Participant Account Balances to “Equity,” by Age

“Equity” is defined as equity funds + company stock + the relevant portion of balanced and target date funds



Source: Tabulations from EBRI/ICI Participant-Directed Retirement Plan Data Collection Project. The analysis is based on a consistent sample of 2.2 million participants with account balances at the end of each year from 1999 through 2006.

APPENDIX: RETIREMENT INCOME SECURITY RESEARCH

Retirement Security Prior to the Implementation of the Pension Protection Act of 2006 (PPA)

Background

The ability of future cohorts of retirees to have broadly defined levels of retirement security has been the focus of several congressional hearings as well as countless public policy analyses in the past. In recent years, there have been several reasons to revisit earlier studies and conclusions. Perhaps foremost among these is the long-term evolution away from “traditional” defined benefit pension plans to individual-account defined contribution retirement plans, such as the 401(k) (at least in the private sector).¹ In addition to transferring investment risk from the employer to employee, this evolution has also resulted in many employees increasing their exposure to longevity risk as well as being put in a situation where they may make one or more of a number of choices that would adversely impact their eventual retirement income. Moreover, those employees who remain active participants within the defined benefit plan system may have already had unexpected modifications to the type of plan sponsored by the employer. Recent legal actions and lack of legislative clarity and/or regulatory guidance may suppress future activity in this regard; however, projecting future benefit accruals may prove problematic even for those employees still participating in a traditional form of final-average defined benefit plans.

While several studies have attempted to project retirement income and wealth, there have been few attempts to reconcile their results with the uncertain amount and duration of retiree expenditures. Moore and Mitchell (1997) estimated how much Health and Retirement Study (HRS) respondents ages 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 were 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.

EBRI/Milbank Study for Oregon, Kansas and Massachusetts

The Employee Benefit Research Institute (EBRI) and the Milbank Memorial Fund, working with the governor of Oregon, set out to see if the necessary retirement security analysis could be undertaken on a state-specific basis and undertook an initial study on the future retirees of Oregon. The results, released in 2001, made it clear that there is a significant shortfall and 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

Note: This portion of the testimony draws heavily from Jack VanDerhei, Testimony for the U.S. Senate Special Committee on Aging Hearing on Retirement Planning: “Do We Have a Crisis in America? Results From the EBRI-ERF Retirement Security Projection Model,” January 27, 2004.

¹ See *EBRI Issue Briefs* no. 249, “An Evolving Pension System: Trends in Defined Benefit and Defined Contribution Plans” (September 2002); no. 232, “The Changing Face of Private Retirement Plans” (April 2001); and no. 190, “Defined Contribution Plan Dominance Grows Across Sectors and Employer Sizes, While Mega-Defined Benefit Plans Remain Strong: Where We Are and Where We Are Going” (October 1997).

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 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 states' 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. In an attempt to provide an approximation of the aggregate amount of additional money that would be needed to provide basic expenditures, we 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) 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 were accumulated annually and then averaged for all retirees in the same birth cohort and gender/family categories.

The model was expanded so that it could be national in scope and initial estimates were published in the November 2003 *EBRI Issue Brief* ("Can America Afford Tomorrow's Retirees: Results From the EBRI-ERF Retirement Security Projection Model") and was discussed at a day-long EBRI policy forum ("Assessing Future Retirement Security With the Results of the EBRI/ERF Retirement Income Projection Model") held Dec. 4, 2003.² In an attempt to make the results easier to comprehend, the primary output metric was changed to one that represents the additional percentage of compensation that each simulated observation would need to save (in addition to the other components already modeled) from 2003 until the time they retired. The entire distribution of outcomes was arrayed and charts displaying median compensation percentages were created for each cohort for a variety of confidence levels and assumptions regarding Social Security and liquidation of housing equity. Additional analysis was conducted to show the probability of retirement security if each individual would save an additional 5 percent of compensation for the remainder of his or her working career.

Accumulation Phase of EBRI 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 private-sector 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.

² See *EBRI Issue Brief* no. 266 (February 2004), "Americans' Future Retirement Security: Implications of the EBRI-ERF Retirement Security Projection Model" (forthcoming).

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.

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.

Retiree Expenditures

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. 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 in addition to those in 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 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 are 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 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 adjusted 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.

Results

The primary objective of this analysis 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 through retirement age) for each of the 18 combinations of birth 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 A and B 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 A 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 median 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 single females, 13.9 percent for single males, and 6.1 percent for families.

Figure B shows the median additional savings required to provide retirement adequacy for a 90 percent confidence level (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: median 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.

Will Individuals Be Able to Save Enough on Their Own (Over and Above What is Already Modeled)?

Figure C 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 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.

Alternative Scenarios

It is important to note that the analysis presented in the three figures above is limited to the baseline assumptions with respect to future Social Security benefits and liquidation of housing equity. Specifically we have assumed the current statutory benefits will continue to be paid regardless of the estimated funding difficulties. In VanDerhei and Copeland (2003), we ran two reform scenarios designed to ensure 75-year solvency of the program. Under the first alternative, benefits were reduced.³ Under the second alternative, both the Social Security normal retirement age and the tax rates were increased.⁴ As expected, the estimated deficits increased under both alternative scenarios, especially for the younger birth cohorts.

Moreover, in our baseline analysis above we assumed that retirees would not use their net housing equity to supplement their retirement income in any way (including housing equity loans). In VanDerhei and Copeland (2003) we estimate two additional responses. Our second scenario assumed any net housing equity is annuitized at retirement. 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. The relative impact of the second scenario was relatively minor; however, the third scenario had a much more dramatic impact, reducing the annual deficits for 2003 by 23 percent.

³ 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.

⁴ 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.

The Impact of PPA and FASB on Single-Employer Defined Benefit Plans⁵

Pension Protection Act of 2006

Signed into law in August 2006, the Pension Protection Act (PPA) has been heralded by many as the most comprehensive reform of defined benefit pension plans since the enactment of the Employee Retirement Income Security Act of 1974 (ERISA), the major federal law governing employment-based benefits. In addition to completely revamping the minimum funding requirements for single-employer⁶ defined benefit plans, it also expands the deduction limits for contributions to these plans and includes reforms that will affect both cash balance pension plans and defined contribution (401(k)-type) plans.

From a public policy perspective, one of the primary reasons for the need to modify the minimum required contributions for defined benefit plans was the financial shape of the single-employer plan termination insurance program administered by the Pension Benefit Guaranty Corporation (PBGC). Enacted as part of ERISA, the PBGC has evolved into a federal government entity providing an insurance-type benefit to indemnify pension plan participants (up to a limit) for certain defined benefit promises made by sponsors who enter bankruptcy with underfunded pension plans.⁷

The premium system for the single-employer plan termination insurance program has been two-tiered since the mid-1980s (VanDerhei, 1988a):

- The first tier is a per-capita premium that is currently equal to \$33 per participant per year, but will be indexed to average national wage growth.
- The second tier is a variable premium of \$9 per \$1,000 of underfunding.

However, several studies had predicted that the level of insurance premia was far below the expected cost for many of the sponsors insured under this program, and that adverse selection and moral hazard would undoubtedly work toward the eventual financial distress of the system (VanDerhei, 1990, and Boyce and Ippolito, 2002). Although the financial position of PBGC had experienced cyclical fluctuations, by the mid-1990s it had entered a surplus position and by 2000 the surplus had grown to \$9.7 billion. However, after several years of falling discount rates⁸ and negative rates of return on equity portfolios, by 2004 the surplus had turned into a deficit of \$23.3 billion.

In February of 2005, the Bush administration released its Single-Employer Defined Benefit Pension Reform Proposal, which attempted to control for several of the perceived limitations of the minimum funding requirements for the single-employer defined benefit pension system:

- Underfunded plans were typically given a funding target of only 90 percent. In essence, plans could be up to 10 percent underfunded without being subject to the special rules enacted to deal with the underfunding problem in 1987 and 1994.
- Discount rates used to value the plan liabilities for underfunded plans were averaged over four years. This means that if discount rates were steadily decreasing (a scenario that, in fact, occurred in the early part of this decade), the average discount rate could be much higher than the value needed to close out a terminated defined benefit plan. Since higher discount rates translate into

⁵ Material in this section draws heavily from VanDerhei (July 2007).

⁶ See Ruschau (2007) for information on how PPA is expected to impact multiemployer plans.

⁷ For approximately the first 10 years of the program, the employer merely needed to terminate an underfunded defined benefit plan for the insurance benefit to be effective. The necessity for the sponsor to actually be in bankruptcy was added only after several large underfunded defined benefit plans were terminated in exchange for a portion of the sponsors' net worth (which in many cases was far less than the amount of defined benefit underfunding they were shedding).

⁸ The discount rate is the value used to adjust future cash flows to the present by reflecting the "time value of money."

lower present values of pension liabilities, the targets that sponsors were using in their calculations were at times artificially low.

- Similarly, asset values could be averaged over five years, subject to constraints. When equity values were low or negative for several consecutive years (again, a scenario experienced in this country in the early part of this decade), the *actuarial* value of pension assets could be considerably higher than their *true market* value at a time when the plan might be turned over to the PBGC.
- Finally, amounts paid in by plan sponsors in prior years that exceeded the minimum amounts legally required could be carried over at book value to be used in future years to reduce or eliminate minimum required contributions. These so-called “credit balances” would automatically accrue at the discount rate used in the calculations and could result in a book value substantially larger than the market value in the future.

The final form of the PPA as enacted by Congress varied substantially from the administration’s proposal with respect to specific details, but it did attempt to deal with the more problematic situations mentioned above. Much of PPA is generally effective in 2008, but many provisions are to be phased in over several years.

The new minimum funding standards replace the previous two-tier system (a funding standard account for all plans plus the deficit reduction contribution for underfunded plans) with a new system in which all single-employer defined benefit plans will have a new funding target of 100 percent of plan liabilities.⁹ In general,¹⁰ the minimum required contribution will now be equal to the target normal cost plus a seven-year amortization¹¹ of unfunded liability, less any permissible credit balances. The target normal cost is the present value of all benefits that are expected to accrue or to be earned under the plan during the plan year, including prior-year benefit accruals that increase because of compensation increases in the current year.

Two assumptions used in computing pension expense will undoubtedly become more volatile under PPA:

- Instead of mandating a discount rate based on the four-year average of corporate bond rates for current liability calculations (as was the case under prior law), benefits will be grouped into three segments: (1) benefits expected to be payable within five years, (2) benefits expected to be payable after five years but within 20 years, and (3) benefits expected to be payable after 20 years. Each interest rate would then be averaged based on an unweighted 24-month average of these rates.¹²
- Plan asset values will likely also become more volatile under PPA, as the “smoothing period” for interest rate calculations has been reduced from five years to two years and the 20 percent corridor around the market value of assets that served as constraints on the actuarial value of assets has been reduced to 10 percent.

The administration’s proposal attempted to deal with the moral hazard and adverse selection problems for the single-employer plan termination insurance program by establishing a proxy for the

⁹ This will be phased in gradually: The target will be 92 percent in 2008, 94 percent in 2009, 96 percent in 2010, before reaching 100 percent in 2011. There is an exception for plans that were already subject to the deficit reduction contribution in 2007: They will have a 100 percent funding target in 2008.

¹⁰ Specific exceptions for at-risk plans are defined below.

¹¹ When the value of plan assets is at least equal to the value of benefit obligations, there is no funding shortfall and no more shortfall amortization installments are required.

¹² It should be noted for investment purposes that a plan sponsor may make a one-time election to use the full corporate bond yield curve without any averaging, rather than using the three separate segment rates.

likelihood that defined benefit sponsors would go bankrupt and thus possibly present a claim to PBGC. The minimum required contribution under this proposal as well as the risk-based premia to PBGC would have been based on targets that vary depending on the financial health of the plan sponsor.¹³ Instead of adjusting for the higher expected likelihood of financially troubled defined benefit sponsors becoming an insured claim for PBGC and directly reflecting this as an increased premium under a full-fledged risk-related premium, PPA reflects the increased severity from these plans by creating a separate category for “at-risk” plans and requires them to provide greater contributions to the plan.

At-risk liability is computed assuming that all participants eligible for benefits in the current year and the next 10 years retire at the earliest possible date and choose the most expensive form of benefits from a present value basis. A plan is defined to be at risk if it is both (1) less than 80 percent funded¹⁴ under standard actuarial assumptions and (2) less than 70 percent funded using the at-risk assumptions. For purposes of this determination, plan assets must generally be reduced by the plan’s credit balance.

The consequences of being designated as an at-risk plan under PPA is that it increases required contributions by increasing the target normal cost and the funding target. If the plan *also* was at risk in at least two of the prior five years, the target normal cost is further increased by 4 percent and the value of plan liabilities used to calculate funding shortfalls is also increased by 4 percent, plus a loading factor of \$700 per participant.¹⁵

The treatment of credit balances under prior law was retained in many situations, but often at a price. For example, if the value of a plan’s assets (reduced by any prefunding balance) is at least 80 percent of the plan’s funding target (determined without regard to the at-risk rules) for the preceding plan year, the plan sponsor may elect to credit all or a portion of the funding standard carryover balance or prefunding balance against the minimum required contribution for the current plan year, thus reducing the amount that must be contributed for the current plan year. Moreover, existing credit balances and new prefunding balances¹⁶ must both be subtracted from assets in determining the “adjusted funding target attainment” percentage that is used to determine whether certain benefits can be paid and whether benefit increases are allowed (Purcell, 2006). The problems arising from carrying credit balances at book value under prior law were dealt with by requiring such amounts to be adjusted for investment gains and losses since the date of the original contribution that created the credit balance.

PPA also provides incentives for plan sponsors to attain certain funding thresholds by providing for restrictions on benefit accruals, benefits increases, and utilization of lump-sum distributions (Purcell, 2006).¹⁷ Under the new law, the plan sponsor is required to freeze benefit accruals for current participants in plans funded at less than 60 percent.¹⁸ Plan amendments that increase benefits are prohibited if the plan

¹³ The financial health of a plan sponsor would be defined as financially weak for this proposal if the plan sponsor had senior unsecured debt that was rated as not being investment grade by each of the nationally recognized statistical rating organizations that has issued a credit rating for the debt.

¹⁴ This percentage is phased in over four years: 65 percent in 2008, 70 percent in 2009, 75 percent in 2010, and 80 percent in 2011 and thereafter.

¹⁵ Under the law, the full at-risk contribution is not required for the first plan year the plan is at risk. The increase in the contribution is phased in over five years. In the first year a plan is at risk, the minimum contribution is equal to the amount required for a plan that is not at risk, plus 20 percent of the difference between that amount and the amount required by the at-risk calculation.

¹⁶ Credit balances must be separated into two categories: balances carried over from 2007 and balances resulting from contributions in 2008 and later years.

¹⁷ Although annuities are the default form of payment in a defined benefit plan, plan sponsors will often give employees the alternative of taking the actuarial equivalent of the annuity in a single sum known as a lump-sum distribution.

¹⁸ Once a plan is funded above 60 percent, the employer—and the union in a collectively bargained plan—must then decide how to credit past service accruals. This provision does not apply during the first five years of a plan’s existence, or if the employer makes an additional contribution prescribed by the statute.

is funded at less than 80 percent of the full funding level, unless the employer makes additional contributions to fully fund the new benefits. Lump-sum distributions are prohibited if the plan is funded at less than 60 percent of the full funding level or if the plan sponsor is in bankruptcy and the plan is less than 100 percent funded. If the plan is funded at more than 60 percent but less than 80 percent, the plan may distribute as a lump sum no more than half of the participant's accrued benefit.

Expected Impact of PPA on Single-Employer Defined Benefit Plans

Condeluci (n.d.) argues that there may be three reasons to expect PPA to prompt pension plan sponsors to freeze accruals for current employees in their plans:

1. Sponsors may be required to fund their plans to a higher level and over a shorter period of time.
2. The new restriction on benefits.
3. The effect credit balances will have on plan assets.

Under prior law—with basic elements dating all the way back to the passage of ERISA in 1974—the minimum required contributions for defined benefit plans were determined by the plan's funding standard account. In general, this would require the plan to make an annual contribution equal to its normal cost plus amortization of supplemental liability plus (minus) an amortization based on experience losses (gains). This value could then be reduced by credit balances that had been carried over at book value and/or funding waivers. In general, the amortization period for supplemental liability was 30 years, while the amortization period for experienced gains or losses was five years.¹⁹

Based on 1987 legislation (and amended in 1994), certain underfunded plans were required to pay an additional amount based on the deficit reduction contribution (DRC) if the funded current liability percentage²⁰ for the plan year is less than 90 percent. The DRC is generally the sum of (1) the "unfunded old liability amount," (2) the "unfunded new liability amount," and (3) the expected increase in current liability due to benefits accruing during the plan year. The "unfunded old liability amount" is the amount needed to amortize certain unfunded liabilities under 1987 and 1994 transition rules.²¹ The "unfunded new liability amount" is the applicable percentage of the plan's unfunded new liability. The applicable percentage is generally 30 percent, but decreases by 0.40 of 1 percentage point for each percentage point by which the plan's funded current liability percentage exceeds 60 percent. Based on a 6 percent discount rate, the equivalent amortization period for a plan with a funding ratio of 60 percent or less would be approximately three years.

Therefore, the overall impact of the change to a uniform amortization period is difficult to assess. It would appear in most cases that well-funded plans with substantial supplemental liabilities will now be required to amortize the amount more rapidly; however, underfunded plans, especially those with funding ratios below 60 percent, may find that the amortized amounts may be decreased.²² Condeluci argues that this increase in funding contributions for well-funded plans may be sufficient to force at least some of them to freeze benefit accruals (which would, in essence, either eliminate or greatly reduce the normal cost component of the minimum required contribution).²³

¹⁹ Changes in actuarial assumptions were generally amortized over a 10-year period.

²⁰ A plan's "funded current liability percentage" is generally the actuarial value of plan assets as a percentage of the plan's current liability. In general, a plan's current liability means all liabilities to employees and their beneficiaries under the plan, determined on a present-value basis.

²¹ For more information on the unfunded old liability amounts, see VanDerhei (1994).

²² This may be mitigated to a significant extent by the additional amounts required for at-risk plans, however.

²³ Stockton (2006) performs a Monte-Carlo simulation on a hypothetical plan to test the impact of many of the new PPA rules and finds that funding ratios increase on average and volatility (as measured by standard deviation of the funding ratio) increases. However, Warshawsky (2007) performs a similar type of simulation for a cash balance plan using proprietary asset/liability software with precise representations of the new and old laws, including transition rules, and finds a reduction in contribution volatility.

The argument put forth by Condeluci with respect to restrictions on benefits suggests that some plans with funding ratios less than 60 percent will take the mandated freeze imposed by PPA and choose to make it permanent. Other sponsors that may be forced to at least partially curtail the availability of lump-sum distributions due to the new PPA-imposed restrictions may find this to be sufficient incentive to freeze the defined benefit plan and offer a defined contribution plan to the employees instead. Moreover, the constraints on collective bargaining negotiations going forward may be reduced if the plan sponsor can reach an agreement with the union and freeze future benefit accruals.

Finally, Condeluci argues that the modification in the utilization of credit balances in the post-PPA period may cause some employers to reconsider their original decision to sponsor a defined benefit pension plan at all. He suggests that this may be especially true if a well-funded defined benefit plan would be considered at risk or subject to benefit restrictions as a result of the credit balance's impact on the plan assets.

Changes in Pension Accounting Standards

For sponsors of defined benefit pension plans, the impact of PPA goes far beyond the annual cash contributions they are required to make to the plans. In addition, plan sponsors filing public accounting statements must also be cognizant of the protocols established by the Financial Accounting Standards Board (FASB)²⁴ with respect to accounting for these plans. For several years after the passage of ERISA in 1974, the reported expense for a defined benefit plan was often the same as the cash contribution; however, with the introduction of FASB statement no. 87, *Employers' Accounting for Pensions*, income statements for fiscal years beginning after December 15, 1986, were required to follow a new approach to determining pension expense that would limit employers' discretion in choice of assumptions and actuarial cost methods so as to provide a more standardized set of pension expense values. Employers' balance sheet items were similarly affected by this statement, although the effective date was delayed to fiscal years beginning after Dec. 15, 1988.²⁵

Under FASB 87, the net periodic pension cost is made up of the following six components: (1) service cost; (2) interest cost; (3) actual return on plan assets, if any; (4) amortization of unrecognized prior service cost, if any; (5) gain or loss to the extent recognized; and (6) amortization of the unrecognized net asset or obligation existing at the date of the initial application of FASB 87.

Service cost is the actuarial present value of benefits attributed by the pension benefit formula to employee service during that period. *Interest cost* is the increase in the projected benefit obligation due to the passage of time. This can be thought of simply as the accrual of interest on a present value or discounted amount. The *actual*²⁶ *return* on plan assets is based on the fair value of plan assets at the beginning and the end of the period, adjusted for contributions and benefit payments. The *prior service cost* component for accounting purposes is the increase in the projected benefit obligation due to a plan amendment, amortized by assigning, at the date of the amendment, an equal amount for each active

²⁴ FASB is the private-sector entity that sets professional standards for financial accounting and reporting. www.fasb.org

²⁵ FASB Statement No. 36, Disclosure of Pension Information, had already established rules governing the disclosure of plan assets and liabilities on the sponsoring employer's financial statement in the early 1980s. However, this was seen as only a stopgap measure until the more contentious issues raised in response to pension expense determination could be resolved.

²⁶ While the return was titled "actual" for disclosure purposes, FASB 87 states that the difference between the actual and expected return on plan assets must be accounted for as a part of the gain or loss component of pension expense. The net result of this treatment is that the expected return on plan assets is used to calculate pension cost for the period.

employee's future period of service, if he or she is expected to receive benefits under the plan.²⁷ In certain cases, the *amortization of prior service cost* must be accelerated. A history of regular plan amendments may indicate that the period during which the employer expects to benefit from the plan (through employee goodwill, wage concessions, etc.) for an amendment is shorter than the remaining service period. This is likely to transpire in collective bargaining agreements with flat-dollar plans in which the dollar amount is renegotiated upward every several years to provide improved benefits to active employees and retirees. If participants expect benefits to be liberalized on a periodic basis, it is unlikely that the employer's economic benefits from the amendment will extend beyond one interval.²⁸

The fifth component of net periodic pension cost, *gain or loss*, results from changes in either the projected benefit obligation or plan assets. These changes result either from experience different from that assumed, including both realized and unrealized gains and losses, or from changes in assumptions. Asset gains and losses are equal to the difference between the actual return on assets during a period and the expected return on assets for that period. The expected return on plan assets is determined by the expected long-term rate of return on plan assets and the market-related value of plan assets. Amortization of net gains or losses that have not yet been recognized in the costs calculated in prior periods is included as a component of the current net pension cost if, at the beginning of the year, the unrecognized net gains or losses (excluding asset gains and losses not yet reflected in market-related value) exceed a so-called corridor amount. This corridor was designed to minimize the pension cost volatility that would otherwise be experienced under the new accounting standard.²⁹

The final component of net periodic pension cost is the *amortization of the unrecognized net asset or obligation* existing at the date of initial application of FASB 87.

Although FASB Statement No. 132, *Employers' Disclosures About Pensions and Other Postretirement Benefits*, recently modified the disclosures required under FAS 87, it did not change the recognition or measurement of defined benefit plans. As the impact of bear and bull markets played out on defined benefit plans in the last 20 years, an increasing number of analysts began to question whether the so-called "smoothing" of gains and losses resulting from differences in expected and realized investment returns was in the best interests of the financial statement users. After the Enron debacle, the outcry for increased transparency in public accounting statements increased and the practice of certain off-balance sheet calculations required by FAS 87 for items such as unamortized prior service cost and unrecognized gains and losses became an increasing target of controversy. Indeed, even the basic definition of how a pension plan liability should be defined (at least for final-average defined benefit plans) was questioned.

Perhaps as a result of this activity, in November 2005 FASB announced it would begin a two-phase approach to revise the basic accounting element for sponsors of defined benefit plans. The first phase was completed in September 2006 with the publication of FASB Statement No. 158, *Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans*. This Statement was designed to improve financial reporting by requiring an employer to recognize the overfunded or underfunded status of a defined benefit postretirement plan as an asset or liability in its statement of financial position and to

²⁷ This is conceptually similar to the amortization of supplemental liability required for minimum funding standards under prior law (other than new liabilities for underfunded plans under OBRA); however, the allocation procedure does not result in a level dollar amount assigned to each year in the amortization period.

²⁸ It is also possible for a plan amendment to decrease the projected benefit obligation. In that case, the reduction must be used to reduce any existing unrecognized prior service cost, and the excess, if any, must be amortized on the same basis as the cost of benefit increases.

²⁹ The corridor is defined as 10 percent of the greater of the projected benefit obligation or the market-related value of plan assets. The annual amortization will be equal to the amount of unrecognized gain or loss in excess of the corridor divided by the average remaining service period of active employees expected to receive benefits under the plan.

recognize changes in that funded status in the year in which the changes occur through comprehensive income of a business entity.³⁰

The second, broader, phase would comprehensively address remaining issues, including:³¹

- How best to recognize and display in earnings and other comprehensive income the various elements that affect the cost of providing postretirement benefits.
- How best to measure the obligation, in particular the obligations under plans with lump-sum settlement options.
- Whether more or different guidance should be provided regarding measurement assumptions.
- Whether postretirement benefit trusts should be consolidated by the plan sponsor.

Expected Impact of FASB Changes on Single-Employer Defined Benefit Plans

The results of the implementation of FAS 158 on shareholders' equity has been significant for many large defined benefit sponsors;³² however, many analysts would argue that this is not reflecting any new information that was not already disclosed in the footnotes to the financial information.

Theoretically, this information was already embedded in the valuation models used in analyzing stocks, and therefore there should be little FAS 158-specific impact on stock prices.³³

The expected impact from the second phase of the pension accounting changes will be much more difficult to predict until such time as the final form of the modifications has been disclosed. Several authors³⁴ have suggested that in an attempt to bring U.S. pension accounting standards into conformity with those evolving for international accounting standards, it is possible that the second phase of the accounting reform will substitute actual investment returns for expected returns in the calculation of the pension expense. Unless a defined benefit sponsor is willing to invest the pension assets in a portfolio designed to replicate the percentage changes that would be realized by the present value of pension liabilities, this change would undoubtedly increase the volatility of the reported pension expense.³⁵

The importance of FASB's changes, if any, in the treatment of the volatility of the asset returns (whether in isolation or when offset by the volatility of the present value of liabilities) will depend to a large extent on whether pension income will be bifurcated into operating and nonoperating income components. If FASB were to conclude that the only component of pension expense that is actually an operating cost would be the plan's service cost, then the pension plan-induced volatility on operating income would likely decrease regardless of the treatment of the other components.

The Impact of PPA on Defined Contribution Plans³⁶

One of the extremely important plan design decisions a 401(k) plan sponsor must make because of PPA is whether to introduce automatic enrollment features. There is extensive literature on the

³⁰ Alternatively, this would be recorded in changes in unrestricted net assets of a not-for-profit organization.

³¹ News Release, Nov. 10, 2005, "FASB Adds Comprehensive Project to Reconsider Accounting for Pensions and Other Postretirement Benefits," www.FASB.org/news/nr111005.shtml

³² General Motors Corp. stockholders' equity was reported to have decreased \$16.9 billion after FAS 158 was adopted. For the 297 companies in the S&P 500 stock index that have defined benefit plans, the aggregate change in shareholders' equity was \$142.5 billion—\$136.8 billion in reductions and \$5.7 billion in gains (Burr, 2007).

³³ One possible exception to this arises from the potential problems with debt covenants. For more on how this might influence pension accounting changes, see VanDerhei and Joannette (March 1988).

³⁴ See Goebel and Kivarkis (2007) and Bowen and Perry (2007) for examples.

³⁵ Other possible changes would include reduction or outright curtailment of the asset smoothing periods as well as modification of the corridor in which cumulative gains/losses are not recognized and the amortization periods for those amounts falling outside the corridor.

³⁶ Material in this section draws heavily from VanDerhei (September 2007) and VanDerhei and Copeland (2008)

potential benefits of automatic enrollment on participation rates, especially for young employees and those with low incomes.³⁷ However, there is also a recognition that the introduction of these programs has a tendency to “anchor” participants’ contribution rates and asset allocation to the defaults chosen by the sponsor;³⁸ hence, the overall increase in expected account balances from adopting these plans will be a function of both the employee’s relative wage level and the employer’s default decisions.

PPA provided a significant incentive for employers that had not already adopted automatic enrollment to reconsider their decisions. PPA pre-empts state laws that might affect plans adopting automatic enrollment provisions and provides additional nondiscrimination safe harbor protections for them. To qualify for the automatic enrollment safe harbor, the contribution rate for automatic enrollees must be at least 3 percent of salary during the first year of participation, 4 percent during the second year, 5 percent during the third year, and 6 percent thereafter. The plan may specify a higher contribution up to a maximum of 10 percent.³⁹

The retirement income prospects for future generations of retirees have been modeled by EBRI extensively in recent years, in an attempt to more accurately predict how various cohorts of Americans will likely fare in retirement. Results have ranged from very bleak for substantial portions of the U.S. population⁴⁰ to fairly positive for 401(k) participants with continuous coverage throughout their working careers: Results suggest a significant portion of these workers’ preretirement income could be replaced by 401(k) accumulations when combined with Social Security (at least Social Security benefits projected under current statutory provisions).

There have been two types of simulation studies in recent years attempting to model the likely retirement income generated by 401(k) plans: those based on administrative records of individual employees currently participating in 401(k) plans, and those based on all (or a significant percentage of) workers whether they are currently participating in a 401(k) plan or not. While each type of simulation model has relative strengths and limitations, it is important to understand that they are designed to answer different questions, or at least answer questions for different subsets of the population. The remainder of this section highlights the major findings from one type of these models before moving to an explanation of the hybrid model used in this study—one that utilizes parameters estimated from administrative records of actual participants and applies them to a broad segment of the entire population of workers.

Simulation Studies Based on 401(k) Participants in EBRI/ICI Database

Assuming that 401(k) accumulations were used to purchase nominal annuities at age 65, the EBRI/ICI 401(k) Accumulation Projection Model predicts baseline median replacement rates at retirement ranging from 51–69 percent, based on final five-year average salary (“replacement rate” meaning the percentage of a worker’s final salary that is replaced in retirement by a nominal annuity purchased with 401(k) assets).⁴¹ However, these baseline results were predicated on the assumption that any worker currently participating in a 401(k) plan would *continue to be offered* a 401(k) plan for each future job. If it is assumed that the worker would have only an *average* chance of being offered a 401(k)

³⁷ See Jodi DiCenzo. “Behavioral Finance and Retirement Plan Contributions: How Participants Behave, and Prescriptive Solutions. EBRI Issue Brief, no. 301 (Employee Benefit Research Institute, January 2007).

³⁸ See James J. Choi, David Laibson, Brigitte C. Madrian, and Andrew Metrick. “Saving for Retirement on the Path of Least Resistance.” In Ed McCaffrey and Joel Slemrod, eds., *Behavioral Public Finance: Toward a New Agenda*. New York: Russell Sage Foundation, 2006, pp. 304–351 and James J. Choi, David Laibson, Brigitte C. Madrian, and Andrew Metrick. “Optimal Defaults and Active Decisions.” *NBER Working Paper*. No. 11074. Cambridge, MA: National Bureau of Economic Research, January 2005.

³⁹ Patrick Purcell, “Summary of the Pension Protection Act of 2006.” CRS Report for Congress. Washington, DC: Library of Congress, Congressional Research Service, October 23, 2006.

⁴⁰ See VanDerhei and Copeland (2003).

⁴¹ See Holden and VanDerhei (2002).

plan at future jobs, the income replacement rates decrease to a range of 21–26 percent. While this scenario is certainly far too pessimistic to be correct, the disparity between the two sets of results demonstrates the importance of continued participation in a 401(k) plan throughout an employee’s working career.

Phrased another way, a crucial factor in the future retirement security of many Americans is *whether they continue to be offered* a 401(k) plan when they change jobs, and, if they are, *whether they continue to participate* in it and contribute at a significant level of savings.

Modeling the Impact of Automatic Enrollment

A year prior to the enactment of the Pension Protection Act of 2006 (PPA), the EBRI/ICI 401(k) Accumulation Projection Model was used to simulate the impact of universal adoption of automatic enrollment features under a combination of default contribution rates and default investment allocations.⁴² In order that the beneficial effect of the expected increase in participation rates could be included in simulation results, “synthetic” employees were generated in the model to include eligible workers who chose *not to participate* in the 401(k) plan. When these employees were added to the model, the median replacement rates under the baseline assumption mentioned above decreased significantly for the lowest-income quartile (23 percent, down from 51 percent) but only mildly for the highest-income quartile (56 percent, down from 67 percent).

Assuming that *all* 401(k) plan sponsors would adopt automatic enrollment immediately (in 2005), the median replacement rates for the lowest-income quartile increased to 37 percent (from the 23 percent baseline) even under the conservative assumptions of a 3 percent default contribution rate and a money market default investment. When the default contribution rate was increased to 6 percent and the default investment was changed to a life-cycle fund, the median replacement rate for this group increased further to 52 percent.⁴³ These results illustrate the very strong improvements that can result from automatic enrollment of workers in a 401(k) plan—especially for the lowest-income workers. However, because this study was written a year prior to the enactment of PPA, it did not include any modeling on automatic escalation of employee contributions.

Last year, data from the 2007 Retirement Confidence Survey (RCS)⁴⁴ were used to provide a first approximation for the expected impact of automatic escalation under the PPA safe harbor rules for a number of different assumptions about worker and employer reactions—over and above that already projected to arise from the adoption of automatic enrollment (but before the law went into effect). The 2007 RCS was fielded several months after the enactment of PPA and asked workers how high they would allow their default 401(k) contributions to go.

One of the extremely important plan design decisions a 401(k) plan sponsor must make because of PPA is whether to introduce automatic enrollment features. There is extensive literature on the potential benefits of automatic enrollment on participation rates, especially for young employees and those with low incomes.⁴⁵ However, there is also a recognition that the introduction of these programs has a tendency to “anchor” participants’ contribution rates and asset allocation to the defaults chosen by the sponsor;⁴⁶ hence, the overall increase in expected account balances from adopting these “automatic” 401(k) plans will be a function of both the employee’s relative wage level and the employer’s default decisions.

⁴² See Holden and VanDerhei (2005).

⁴³ Similar figures for the high-income quartile were 52 percent under the 3 percent contribution rate and money market investment, and 63 percent for the 6 percent contribution rate and the life-cycle investment.

⁴⁴ See Helman, VanDerhei and Copeland (2007).

⁴⁵ See DiCenzo (2007).

⁴⁶ See Choi, Laibson, Madrian and Metrick. (2005 and 2006).

PPA provided a significant incentive for employers that had not already adopted automatic enrollment to reconsider their decisions. PPA pre-empts state laws that might affect plans adopting automatic enrollment provisions and provides additional nondiscrimination safe harbor protections for them. To qualify for the automatic enrollment safe harbor, the contribution rate for automatic enrollees must be at least 3 percent of salary during the first year of participation, 4 percent during the second year, 5 percent during the third year, and 6 percent thereafter. The plan may specify a higher contribution up to a maximum of 10 percent.⁴⁷

Modeling the Impact of Automatic Escalation of 401(k) Contributions

Although the automatic escalation of 401(k) contributions described above has been shown to potentially increase employee contributions considerably in a limited number of test cases,⁴⁸ these experiments have simply been too recent to show how long and/or to what extent workers are likely to continue the periodic escalations before opting out of any additional increases. There has been detailed exploration of the impact of automatic enrollment on participation decisions, investment allocations, and the desired contribution rate in the pre-PPA environment; however, the inability to measure the worker's optimal stopping point in the automatic escalation process has made it difficult to simulate the impact of PPA on 401(k) accumulations.

Fortunately, as part of the 2007 RCS, this information could be elicited from 456 employees who were currently contributing to a 401(k) plan by their responses to the following question:⁴⁹

Suppose your employer automatically increased the percentage of your salary contributed to the plan by 1% each time you received a raise. For example, your contribution might increase from 3% to 4% of your salary with your first raise, and from 4% to 5% with your next raise. You could choose to discontinue the automatic increase at any time. At about what percentage of your salary do you think you would discontinue the automatic increase?

Three percent of the employees responded that they would discontinue the increase immediately or before the first raise. Twenty-five percent indicated a percentage between 1–5 percent, while another 44 per-cent estimated they would continue until some place in the 6 to 10 percent range. Thirteen percent chose a limit between 11 and 15 percent, while 14 percent indicated they would allow the increase to exceed 15 percent. While there is no guarantee that the survey responses will reflect how 401(k) participants will actually react when given the chance to opt out of additional increases in deferrals, it does provide a useful contrast to the simplistic assumption that all 401(k) participants will allow the annual increases until it reaches a point pre-specified by the employer.⁵⁰

This information was added into the simulation model's baseline assumptions from the 2005 simulation study mentioned above with a 3 percent initial default contribution rate and life-cycle default investment. These plan design assumptions were rather obvious, given the requirements for the PPA safe-harbor and the Qualified Default Investment Alternative regulations;⁵¹ however, setting the proper values for other assumptions proved somewhat more problematic.

⁴⁷ See Purcell (2006).

⁴⁸ See Benartzi and Thaler (2004).

⁴⁹ See Figure 2 of VanDerhei (2007) for the distribution of employee responses to the question.

⁵⁰ It could be argued that the distribution of responses to this question is biased upwards given that it was only asked of employees already choosing to contribute to a 401(k) plan. Employees who would have been eligible nonparticipants in a voluntary enrollment system may indeed exhibit a less pronounced tendency to allow contributions to continue to escalate if their employer chooses to sponsor a 401(k) plan with automatic enrollment.

⁵¹ The Department of Labor issued final regulations for Qualified Default Investment Alternatives (QDIAs) on October 24, 2007 to provide, inter alia, employers who adopt automatic enrollment plans a safe harbor from fiduciary risk when selecting an investment for participants who fail to elect their own investment. Sec. 404(c)(5)(A)

The first of these assumptions deals with the question of whether employees are likely to maintain their higher contribution rate from a prior job when it comes to setting the initial contribution rate with a new employer. For example, if employees start at a 3 percent contribution rate with the first employer and leave when they have already increased the contribution rate to 6 percent, will they *maintain their contribution rate* when they move to the second employer? Or would they *start over*, and drop back down to 3 percent? Since it will likely be years before researchers have sufficient information to determine which of these scenarios is more likely, and for whom, the results were simulated separately for both scenarios. The second assumption that is still difficult to set with any certitude is whether the worker's contribution escalation will be constrained by the employer response to the safe harbor minimum (6 percent of compensation) or the safe harbor maximum (10 percent of compensation).

Simulation Results With the EBRI/ERF Retirement Income Projection Model

VanDerhei and Copeland (June 2008) used the EBRI/ERF Retirement Income Projection Model to simulate the likely impact of a move from voluntary enrollment to automatic enrollment among current 401(k) sponsors and found the following:

- ***Significant impact, especially for low-income:*** This analysis indicates that even under the most conservative assumptions for auto-escalation of contributions, switching 401(k) plans to auto-enrollment is likely to have a very significant positive impact in generating additional retirement savings for many workers, especially for low-income workers.
- ***Range of increases under auto-enrollment:*** When results are aggregated across all income categories, the increase in the value of 401(k) accumulations at age 65 as a multiple of final earnings for those currently ages 25–29 would be approximately 2.4 to 2.6 times final salary by switching from voluntary enrollment to automatic enrollment.
- ***Higher-paid unlikely to benefit as much:*** Although the aggregate results favor automatic enrollment, distributional analysis of the differences between the two systems indicates that the higher paid are not likely to benefit as much from such a change.
- ***Lowest-paid likely to see significantly higher 401(k) accumulations:*** The median 401(k) accumulations for the lowest-income quartile of these workers (assuming all 401(k) plans were voluntary enrollment) would only be 0.1 times final earnings at age 65 (this is largely due to the fact that 41 percent of workers—as opposed to participants—were assumed to have zero balances at age 65). However, if all 401(k) plans are assumed to be using the auto-enrollment provisions under PPA, the median 401(k) accumulations for the lowest-income quartile jumps to 2.5 times final earnings under the most conservative assumptions and 4.5 times final earnings under the most beneficial assumptions. Even for the top 25 percent of these workers (when ranked by 401(k) accumulations as a multiple of final earnings), there are large increases: the multiple under a voluntary enrollment scenario is 1.8 times final earnings, whereas auto-enrollment provides multiples ranging from 6.5 to 10.4, depending on auto-escalation of contributions.

The Impact of PPA and FASB on Retirement Security

In the spring of 2007, EBRI and Mercer Human Resource Consulting surveyed defined benefit (pension) sponsors to gauge their recent activity as well as planned modifications with respect to both defined benefit and defined contribution (401(k)-type) plan design and investment behavior within the defined benefit plans. The survey also was able to determine what, if any, increases in employer contributions to defined contribution plans were provided in conjunction with the defined benefit

of ERISA provides that, for purposes of section 404(c)(1) of ERISA, a participant in an individual account plan shall be treated as exercising control over the assets in the account with respect to the amount of contributions and earnings which, in the absence of an investment election by the participant, are invested by the plan in accordance with regulations prescribed by the Secretary of Labor.

modifications. VanDerhei (July 2007) details the likely modifications to defined benefit plans as well as the attendant modifications to existing defined contribution plans.

The process of projecting which individuals are likely to have adequate retirement income has always been problematic. This has undoubtedly become more difficult in the last two decades, as the private retirement system in the United States has gradually evolved from one that was, for many employees, focused primarily on defined benefit plans to one that is more of a hybrid between defined benefit (pensions) *and* defined contribution (401(k)-type) plans.⁵²

The reason for the increased modeling difficulties stems largely from the introduction of employee choice as a major determinant of the eventual retirement income for a retiree. In a *defined benefit* plan, the employer makes most (if not all) of the decisions, and an employee is either covered or not. Once the likelihood of coverage and the generosity parameters of the plans are modeled, the only major uncertainty is the employee's participation in the labor market, relative wage growth, and job change behavior. *Defined contribution* plans offer several additional modeling challenges, in addition to the need to project future investment income, at least as currently designed. In many defined contribution plans, employees must make the decision to participate, and, if so, how much to contribute and where to invest their own employee contributions and (if offered) often the employer contributions. Job turnover presents another modeling challenge, as the probability of cashing out (as opposed to retaining the amounts in the current employer's plan or rolling them over to the new employer's plans and/or an IRA) must be estimated. Another problem arises at the time of retirement, given the increased probability that employees will need to deal with longevity risk, as opposed to purchasing an immediate annuity or otherwise shifting at least some of this risk to another entity similar to the annuity options inherent in a defined benefit plan.

Estimating retirement income adequacy became even more difficult in recent years as an increasing number of defined benefit sponsors chose to either close their plan to new workers or go the additional step of freezing the accruals to the current employees as well. VanDerhei and Copeland (2004) provided early estimates of how these phenomena would likely affect defined benefit participants if *all* existing defined benefit plans (with certain types of plan designs) were assumed to freeze their plans immediately; however, without some type of modeling with respect to the relative likelihood of this occurrence as a function of sponsor and/or plan characteristics, the impact on future cohorts of retirees could not be estimated.

The pace of these transactions appears to have accelerated in recent years (Munnell et al., 2006), and EBRI estimates were used to demonstrate the extent to which employer contributions to a defined contribution plan would need to be increased to financially indemnify stylized individuals for the reduction in expected retirement income (Walsh, 2006). This analysis was later expanded to simulate the impact on the full gamut of job tenure possibilities (VanDerhei, 2006).

While it is certainly possible to make informed predictions of future closing/freezing behavior based on the recent time series of Form 5500 filings, it would be extremely difficult to accurately extrapolate these results without paying careful attention to the likely impact of PPA on changes in defined benefit coverage for employees each time they change jobs, as well as the potential for accrual freezes for some employees even before they change jobs. Moreover, as has been demonstrated in this *Issue Brief*, the vast majority of defined benefit pension sponsors that have either closed or frozen their plans in the last two years or plan to do so in the next two years will either *increase* the matching or non-matching employer contribution to an existing defined contribution plan, or *establish a new one*.

⁵² Although the explosion of 401(k) plans following the release of the proposed regulations in November 1981 is often cited as the catalyst of the defined contribution plan expansion, other types of defined contribution plans were already quite prevalent and indeed defined contribution plans already accounted for 69 percent of the total number of private defined retirement plans in 1981 (albeit many of these were small plans and in terms of active participants, defined contribution plans only accounted for 41 percent of the total). See Olsen and VanDerhei (1997) for more detail.

Obviously, the additional retirement wealth generated by these contributions (as well as the additional employee deferrals likely to arise, especially when matching formulae are modified) must be factored into any careful analysis of the retirement income prospects of future retirees.

Finally, any accurate analysis must pay careful attention to the likely structural changes in defined contribution plans by sponsors that modify their defined benefit plans. This *Issue Brief* demonstrates that a much larger percentage of defined benefit sponsors that have either closed or frozen their pension plans in the last two years, or plan to do so in the next two years, will end up with automatic enrollment provisions in their defined contribution (401(k)-type) plans than their counterparts who do *not* adopt these changes to their defined benefit plan pensions. The ability to establish defined benefit-type provisions (such as automatically enrolling employees in the plan and making default contribution and asset allocation decisions for them) in the defined contribution plan has extremely important public policy implications. As shown in Holden and VanDerhei (2005), even with a relatively small default contribution rate (3 percent) and a very conservative asset allocation (money market), the median account balance for 401(k) eligible employees in the lowest income quartile was simulated to increase by 61 percent.

As is typically true in the private retirement universe, plan sponsors' reaction to influences such as PPA and FASB will likely be quite varied. EBRI will use the results published in this *Issue Brief*, in addition to other actuarial information generously made available by Mercer Human Resource Consulting to modify the EBRI/ERF Retirement Security Projection model and publish the likely impact of these changes on overall retirement income adequacy for future retirees in a forthcoming *Issue Brief*.