

GAO

Report to the Chairman, Committee on
Education and Labor, House of
Representatives

November 2007

PRIVATE PENSIONS

Low Defined Contribution Plan Savings May Pose Challenges to Retirement Security, Especially for Many Low-Income Workers



G A O

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Highlights of [GAO-08-8](#), a report to the Chairman, Committee on Education and Labor, House of Representatives

Why GAO Did This Study

Over the last 25 years, pension coverage has shifted primarily from “traditional” defined benefit (DB) plans, in which workers accrue benefits based on years of service and earnings, toward defined contribution (DC) plans, in which participants accumulate retirement balances in individual accounts. DC plans provide greater portability of benefits, but shift the responsibility of saving for retirement from employers to employees. This report addresses the following issues: (1) What percentage of workers participate in DC plans, and how much have they saved in them? (2) How much are workers likely to have saved in DC plans over their careers and to what degree do key individual decisions and plan features affect plan saving? (3) What options have been recently proposed to increase DC plan coverage, participation, and savings? GAO analyzed data from the Federal Reserve Board’s 2004 Survey of Consumer Finances (SCF), the latest available, utilized a computer simulation model to project DC plan balances at retirement, reviewed academic studies, and interviewed experts.

What GAO Recommends

GAO is not making any recommendations.

To view the full product, including the scope and methodology, click on [GAO-08-8](#). For more information, contact Barbara Bovbjerg at (202) 512-7215 or bovbjerg@gao.gov.

PRIVATE PENSIONS

Low Defined Contribution Plan Savings May Pose Challenges to Retirement Security, Especially for Low-Income Workers

What GAO Found

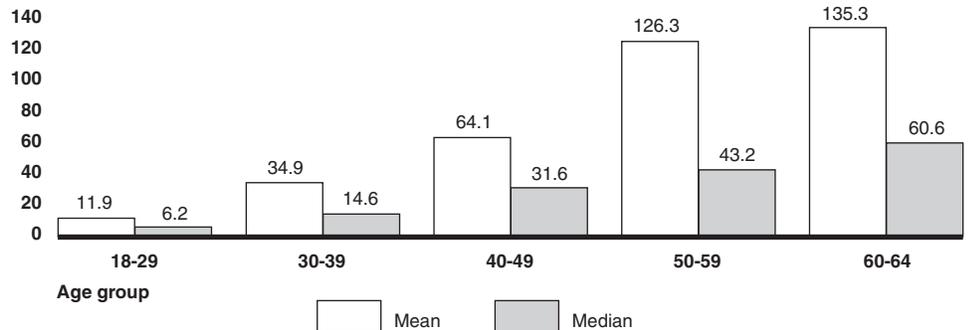
GAO’s analysis of 2004 SCF data found that only 36 percent of workers participated in a current DC plan. For all workers with a current or former DC plan, including rolled-over retirement funds, the total median account balance was \$22,800. Among workers aged 55 to 64, the median account balance were \$50,000, and those aged 60 to 64 had \$60,600 (see figure below). Low-income workers had less opportunity to participate in DC plans than the average worker, and when offered an opportunity to participate in a plan, they were less likely to do so. Modest balances might be expected, given the relatively recent prominence of 401(k) plans.

Projections of DC plan savings over a career for workers born in 1990 indicate that DC plans could on average replace about 22 percent of annualized career earnings at retirement for all workers, but projected “replacement rates” vary widely across income groups and with changes in assumptions. Projections show almost 37 percent of workers reaching retirement with zero plan savings. Projections also show that workers in the lowest income quartile have projected replacement rates of 10.3 percent on average, with 63 percent of these workers having no plan savings at retirement, while highest-income workers have average replacement rates of 34 percent. Assuming that workers offered a plan always participate raises projected overall savings and reduces the number of workers with zero savings substantially, particularly among lower-income workers.

Recent regulatory and legislative changes and proposals could have positive effects on DC plan coverage, participation, and savings, some by facilitating the adoption of automatic enrollment and escalation features. Some options focus on encouraging plan sponsorship, while others would create accounts for people not covered by an employer plan. Our findings indicate that DC plans can provide a meaningful contribution to retirement security for some workers but may not ensure the retirement security of lower-income workers.

Total DC Balances for Workers with a Current or Former DC Plan, Including Rolled-Over Retirement Funds, by Age Group, 2004 SCF

Total DC balances including rollovers in thousands of dollars



Source: GAO analysis of 2004 Survey of Consumer Finances.

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Abbreviations

AWI	average wage index
BLS	Bureau of Labor Statistics
CODA	cash or deferred arrangement
CPS	Current Population Survey
CRS	Congressional Research Service
DB	defined benefit
DC	defined contribution
EBRI	Employee Benefit Research Institute
EBSA	Employee Benefits Security Administration
ERISA	Employee Retirement and Income Security Act of 1974
ESOP	employee stock ownership plan
HRS	Health and Retirement Study
ICI	Investment Company Institute
IRA	individual retirement account
MINT3	Modeling Income in the Near Term
OCACT	Office of the Chief Actuary
PPA	Pension Protection Act of 2006
PSG	Policy Simulation Group
PSID	Panel Study of Income Dynamics
SCF	Survey of Consumer Finances
SEP	Simplified Employee Pension Plan
SIMPLE	Savings Incentive Match Plan for Employees of Small Employers
SIPP	Survey of Income and Program Participation
SSA	Social Security Administration
UA	universal account

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United States Government Accountability Office
Washington, DC 20548

November 29, 2007

The Honorable George Miller
Chairman
Committee on Education and Labor
House of Representatives

Dear Mr. Chairman:

Employer-sponsored pensions represent an important component of retirement income. Since the early 1980s, while the percentage of workers participating in a pension plan has remained around 50 percent of the private sector work force, pension coverage has seen a noticeable shift away from “traditional” defined benefit (DB) plans, in which workers typically accrue benefits based on years of service and earnings, toward defined contribution (DC) plans, in which participants accumulate balances in personal accounts. DC plans provide participants tax-preferred savings vehicles, portability, and the transparency of known account balances. However, they shift the responsibility of saving for retirement, and certain key risks, from employers to employees. Under such plans, workers often manage the investment of plan assets throughout their lives. However, workers may receive limited or no contributions from their employers, spend accumulated savings prior to retirement, or choose not to participate in a pension plan at all, ultimately arriving at retirement with insufficient savings to support themselves. Further, retirees usually must manage their DC plan savings to make them last throughout retirement. Possible reforms to Social Security to address that program’s long-term solvency could reduce benefits for future retirees, possibly increasing the future role of DC plans, as well as other personal savings, in providing retirement income.¹

Based on these concerns, this report addresses the following questions: (1) What percentage of workers participate in DC plans, and how much have they saved in them? (2) How much are workers likely to have saved in DC plans by the time they reach retirement and to what degree do certain key

¹ Further, the Social Security normal retirement age for receiving full benefits has begun rising from age 65 until reaching age 67 starting in 2027, a fact that will reduce benefits, relative to current rules, for those retiring at a given age.

individual decisions and plan features affect plan saving? (3) What options have been recently proposed to increase DC plan coverage, participation, and savings?

To analyze participation and savings in DC plans, we examined data from the 2004 version of the Federal Reserve Board's Survey of Consumer Finances (SCF), the latest available SCF, and data published by other government agencies, by private organizations, and from academic studies.² To analyze how much Americans can expect to save in DC plans by the time they retire and the factors that affect these savings, we utilized a microsimulation model, PENSIM, that simulates demographic, working, and pension patterns for a constructed sample over their lives. (See appendix I for further details of our projections using PENSIM.) We also reviewed similar studies to compare their methodologies and conclusions (see app. II). To analyze policy options to increase DC plan coverage, participation, and savings, we synthesized information gathered from interviews of plan practitioners, financial managers, and public policy experts, as well as from academic and policy studies on DC plan participation and savings. We also researched current government initiatives and policy proposals to broaden participation in account-based pension plans and increase retirement savings. We conducted our work from July 2006 to October 2007 in accordance with generally accepted government auditing standards.

Results in Brief

Regardless of the age of the individual, and at most income levels, DC account participation is low, and the account balances of workers participating in DC plans are modest. According to our analysis of the 2004 SCF, shows that only 36 percent of workers were participating in a DC plan with their current employer. For all workers with a current or former DC plan, including funds rolled over into a new plan or an IRA, the median account balances measured \$22,800. Among workers aged 55 to 64 with a current or former DC plan, including rolled over retirement funds, the median account balance was \$50,000, which if converted into an annuity at age 65 would represent about \$4,400 per year for life. While we might expect older workers to have limited balances in DC plans because

² The SCF is conducted every 3 years to provide detailed information on the balance sheet, pension, income, and other demographic characteristics of U.S. families. The 2004 survey is the most recently published survey. Data from the SCF are widely used by branches of the U.S. government and major economic research centers. Further detail about the SCF and GAO's analysis can be found in app. I.

relatively few employers started offering such plans until the 1980s, thus not giving older workers the opportunity to save in them for their whole careers, it is notable that DC plan savings will be only a limited component of retirement income for this group. Leakage, or the cashing out of lump-sum distributions for non-retirement purposes, could adversely affect account accumulation for some plan participants. From our analysis of the 2004 SCF, of the 21 percent of households reporting that they had previously received lump-sum distributions from previous jobs' retirement plans, about 47 percent cashed out all the funds, 4 percent cashed out some of the funds, and 50 percent rolled over all the funds into another retirement account. Low-income workers had the opportunity to participate in DC plans less frequently than the average worker, and when they were offered a plan, they were less likely to do so. As a result, only 8 percent of workers in the lowest income quartile participated in DC plans with their current employer.

Simulations of future workers' DC plan savings over an entire working career indicate that DC plans could replace, on average, about 22 percent of annualized career earnings at retirement, but with projected replacement rates varying widely across income groups and with changes in certain assumptions. These projections show that individuals in this cohort would accumulate enough DC plan savings over their careers to produce average annuitized retirement income of \$18,784 (in 2007 dollars) per year, but also that about 37 percent of the sample population would have zero savings from DC plans when they retire. Workers in the lowest income quartile have projected replacement rates of 10.3 percent on average, but 63 percent of these workers are projected to have no DC savings at retirement. Highest-income workers, in contrast, have average projected replacement rates of almost 34 percent from DC plans. Workers who are eligible to participate in a plan for at least 15 years have an average projected replacement rate of 33.5 percent, but about 16 percent of these workers still have no projected savings at retirement. Some changes in assumptions in our projections indicate that certain key individual behaviors or plan features have a significant impact on plan savings, especially for low-income workers, and on the number of workers with zero savings at retirement. Assuming that all workers who are offered a plan always participate in it would raise average retirement income from DC plans by about 40 percent, with particularly high increases to lowest-income workers and a reduction in the number of workers who do not save at all. Assuming that workers do not withdraw money from their accounts while they are working—that is, no leakage occurs—raises overall average annuity income from DC plans by about 11 percent and reduces the percentage of those with no DC savings at retirement by over

25 percent. Other scenarios, such as working longer or raising contribution limits, raised savings primarily for higher-income workers, and reduced the number of workers with zero savings at retirement only slightly.

Recent regulatory and legislative changes and proposals could have positive effects on DC plan coverage, participation, and savings. Some of these have facilitated plan sponsors' adoption of automatic enrollment and automatic escalation of contributions, which some studies indicate may increase DC participation and savings among workers who already have access to a plan. Other proposals focus on encouraging more employers to sponsor plans in order to increase plan participation and savings. In one, the "State-K" proposal, states would collaborate with private financial institutions to offer employers the option of adopting a state-designed low-cost plan. Broader options, such as the automatic individual retirement account (IRA) or universal accounts proposals, would seek to extend retirement account coverage by facilitating savings in IRAs or creating retirement savings vehicles for people not covered by a voluntary employer based retirement plan. Another would expand the saver's credit by making it refundable to workers who pay little or no federal income tax. It is important to note that Social Security benefits provide the bulk of retirement benefits for most households; evaluations of income security should consider total retirement income from all sources, not just DC plans.

Background

Employer-sponsored pensions fall into two major categories: defined benefit (DB) and defined contribution (DC) plans. In DB, or traditional, plans, benefits are typically set by formula, with workers receiving benefits upon retirement based on the number of years worked for a firm and earnings in years prior to retirement.³ In DC plans, workers accumulate savings through contributions to an individual account. These accounts are tax-advantaged in that contributions are typically excluded from current income, and earnings on balances grow tax-deferred until

³ A typical "final average pay" plan might set annual benefits equal to 1.5 percent of the average of the employee's final 5 years of earnings multiplied by the employee's tenure at the firm in years.

they are withdrawn.⁴ An employer may also make contributions, either by matching employee's contributions up to plan or legal limits, or on a non-contingent basis.

Like DB plans, DC plans operate in a voluntary system with tax incentives for employers to offer a plan and for employees to participate. Contributions to and earnings on DC plan accounts are not taxed until the participant withdraws the money, although participants making withdrawals prior to age 59 ½ may incur an additional 10 percent tax.⁵ In 2006, the pension tax expenditure for DC plans amounted to \$54 billion.⁶ In addition, a nonrefundable tax credit to qualifying low-and middle-income workers who make contributions, the saver's credit, accounted for less than 2 percent of the 2006 tax expenditure on account-based retirement plans.⁷

DC plans offer workers more control over their retirement asset management, but also shift some of the responsibility and certain risks onto workers. Workers generally must elect to participate in a plan and make regular contributions into their plans over their careers. Participants typically choose how to invest plan assets from a range of options

⁴ Beginning in 2006, plans were permitted to allow employees to designate some contributions to Roth 401(k) plans, which are not excluded from current income but allow for tax-free withdrawals in retirement. Economic Growth and Tax Relief Reconciliation Act of 2001, Pub. L. No. 107-16, § 617, 115 Stat. 38, 103-06 (codified at 26 U.S.C. § 402A).

⁵ 26 U.S.C. § 72(t). The Internal Revenue Code (IRC) sets limits on annual contributions to DC plans by both employees and employers. 26 U.S.C. § 415(c). In 2007, an employee may make up to \$15,500 in tax-deductible contributions into a DC plan, and employee and employer combined contributions cannot exceed \$45,000. A worker age 50 or older may contribute an additional \$5,000 in annual "catch-up" contributions. The IRC exempts distributions from DC plans from an additional 10 percent tax if taken for certain purposes. 26 U.S.C. § 72(t)(2). For example, if the employee becomes disabled, needs funds for medical purposes, or if the distribution is taken upon separation of service at age 55, the additional tax does not apply.

⁶ This tax expenditure includes Keogh plans (\$10 billion), 401(k) plans (\$41 billion), employee stock ownership plans (\$2 billion), and the saver's credit (\$1 billion). Summing these figures does not take into account any interactions. In addition, the tax expenditure for DB plans measured \$49 billion and for IRAs measured \$4 billion.

⁷ The saver's credit is a credit against federal income tax available to low-and middle-income taxpayers based on their qualified contributions to 401(k) and other retirement savings plans and to IRAs. 26 U.S.C. § 25B. The Pension Protection Act of 2006 made the saver's credit permanent and indexed qualifying taxable income levels for inflation. Pub. L. No. 109-280 §§ 812 and 833(a), 120 Stat. 997, 1003-04.

provided under their plan, and accordingly face investment risk.⁸ Savings in DC plans are portable in the sense that a participant may keep plan balances in a tax-protected account upon leaving a job, either by rolling over plan balances into a new plan or an IRA, or in some cases leaving money in an old plan.⁹ Workers may have access to plan savings prior to retirement, either through loans or withdrawals; participants may find such features desirable, but pre-retirement access may also lead to lower retirement savings (sometimes referred to as leakage) and possible tax penalties. Workers who receive DC distributions in lump-sum form must manage account withdrawals such that their savings last throughout retirement. In contrast, a formula, often based on preretirement average pay and years of service, determines DB plan benefits, and workers are usually automatically enrolled in a plan. The employer has the responsibility to ensure that the plan has sufficient funding to pay promised benefits, although the sponsor can choose to terminate the plan.¹⁰ DB plans also typically offer the option to take benefits as a lifetime annuity, or periodic benefits until death. An annuity provides longevity insurance against outliving one's savings, but may lose purchasing power if benefits do not rise with inflation. Table 1 summarizes some of the primary differences between DC and DB plans.

⁸ About 87 percent of all 401(k) plans generally allow participants to choose how much to invest, within federal limits, and to select from a menu of diversified investment options selected by the employer sponsoring the plan, such as an assortment of mutual funds that include a mix of stocks, bonds, and money market investments.

⁹ A DC plan sponsor may make an automatic distribution of a participant's account balance when the participant leaves a job if the balance does not exceed \$5,000. However, if the balance exceeds \$1,000, the sponsor must automatically roll this money over into a default IRA or keep the balances in the plan, unless the participant explicitly chooses otherwise. 26 U.S.C. § 401(a)(31).

¹⁰ The Pension Benefit Guaranty Corporation (PBGC) guarantees the payment of most private sector DB pension benefits in the event of sponsor termination of an underfunded plan, up to certain limits. 29 U.S.C. §§ 1322 and 1322a. For plans terminating in 2007, PBGC pays a maximum of \$4,125 per month for a single straight-life annuity to a 65-year-old retiree, with lower guarantees for younger retirees.

Table 1: Key Characteristics of Defined Contribution and Defined Benefit Plans

	Defined contribution plans	Defined benefit plans
What determines the level of benefits?	Contributions into a personal account and the return on assets.	A formula, typically based on years of service and salary history.
What does the employee have to do to participate and earn benefits in the plan?	May require waiting for eligibility and sign-up by employee. Participants may need to work up to 6 years to fully vest in employer matching contributions	Eligibility and participation are typically automatic. Workers working at least 1,000 hours per year earn years of service toward benefits. Participants may need to work for up to 7 years to fully vest in plan benefits.
How are contributions made?	Typically, employee decides how much to contribute from current wages; employer may also contribute.	Typically by employer only, except in some public sector plans.
Who manages the assets and assumes the risks of investing it?	Employee, in most plans.	Plan sponsor; benefits are government-insured up to certain limits.
What happens to the benefits when the employee leaves the job?	Can be left in plan, rolled over to an IRA, or cashed out (often with a penalty if done before age 59 ½)	Sometimes unavailable until beneficiary reaches specified retirement age.
How are benefits taken in retirement and what are the major risks they pose?	Typically by withdrawing from total balances, and must be managed to last throughout retirement.	Typically payable as life annuities, but plan may offer lump sum option. Annuities lose purchasing power over time if not indexed to inflation.

Source: GAO analysis

Over the past 25 years, DC plans have become the dominant type of private sector employee pension. In 1980, private DB plans had 38 million participants, while DC plans had 20 million. As of 2004, 64.6 million participants had DC plans, while 41.7 million had DB plans. Further, over 80 percent of private sector DC participants in 2004 were active participants (in a plan with their current employer), while about half of DB participants had separated from their sponsoring employer or retired. According to the Employee Benefit Research Institute (EBRI), while overall pension coverage among families remained around 40 percent between 1992 and 2001, 38 percent of families with a pension relied exclusively on a DC plan for retirement coverage in 1992, while 62 percent had a DB plan. In 2001, 58 percent of pension-participating families had only a DC plan, while 42 percent had a DB plan.¹¹ Assets in all DB plans exceeded total DC assets as recently as 1995. As of 2006, DC plans had almost \$3.3 trillion in assets while DB plans had almost \$2.3 trillion. In addition, assets in IRAs, accounts that are also tax protected and include

¹¹ See Craig Copeland, "Individual Account Retirement Plans: An Analysis of the 2004 Survey of Consumer Finances," Employee Benefit Research Institute *Issue Brief*, No. 293 (Washington, D.C.: May 2006).

assets from rolled-over balances from employer-sponsored plans, measured over \$4.2 trillion in 2006.

There are several different categories of DC plans. Most of these plans are types of cash or deferred arrangements (CODA), in which employees can direct pre-tax dollars, along with any employer contributions, into an account, with assets growing tax deferred until withdrawal. The 401(k) plan is the most common, covering over 85 percent of active DC participants. Certain types of tax-exempt employers may offer plans, such as 403(b) or 457 plans, which have many features similar to 401(k) plans. Many employers match employee contributions, generally based on a specified percentage of the employee's salary and the rate at which the participant contributes.¹² Small business owners may offer employees a Savings Incentive Match Plan for Employees of Small Employers (SIMPLE) or a Simplified Employee Pension Plan (SEP), two types of DC plans that have reduced regulatory requirements for sponsors. Other types of DC plans keep the basic individual account structure of the 401(k), but with different requirements and employer practices. Some are designed primarily for employer contributions. These include money purchase plans, which specify fixed annual employer contributions; profit sharing plans, in which the employer decides annual contributions, perhaps based on profits, into the plan, and allocations of these to each participant; and employee stock ownership plans (ESOPs), in which contributions are primarily invested in company stock.¹³

Building up retirement savings in DC plans rests on factors that are, to some degree, outside of the control of the individual worker, as well as behaviors an individual does control (see fig. 1). Factors outside the individual's direct control include the following:

¹² A typical employer match might, for example, equal 50 percent of employee contributions on the first 6 percent of deferred employee salary.

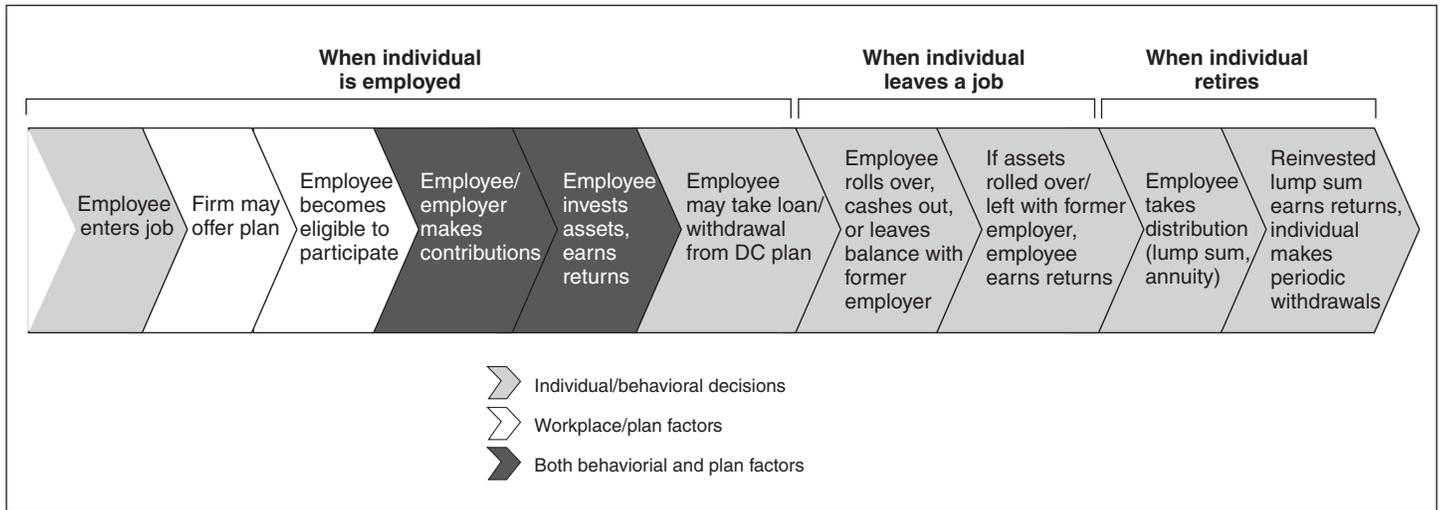
¹³ Some employers sponsor cash balance plans, which have some characteristics of both DB and DC plans. While cash balance plans express accrued benefits in terms of a lump-sum balance, they are DB plans in which benefits are determined by formula. For more on cash balance plans, see GAO, *Private Pensions: Information on Cash Balance Pension Plans*, GAO-06-42 (Washington, D.C.: Nov. 3, 2005); *Cash Balance Plans: Implications for Retirement Income*, HEHS-00-207 (Washington, D.C.: Sept. 29, 2000); and *Private Pensions: Implications of Conversions to Cash Balance Plans*, HEHS-00-185 (Washington, D.C.: Sept. 29, 2000).

-
- **Plan sponsorship**—the employer’s decision to sponsor a plan, as well as participation eligibility rules.
 - **Employer contributions**—whether the sponsor makes matching or noncontingent contributions.
 - **Investment options**—the plan sponsor’s decisions about investment options to offer to participants under the plan.
 - **Market returns on plan assets**—market performance of plan assets.

Key individual decisions and behaviors that may affect retirement savings include the following:

- **Employee contributions**—deposits into the plan account, typically out of current wages.
- **Investment decisions**—how to invest plan assets given investment options offered under the plan.
- **Withdrawals/loans**—pre-retirement withdrawals from account balances, which usually incur a tax penalty. Similarly, taking out a loan from a plan, if allowed, may reduce future balances if the loan is not repaid in full and treated as a withdrawal, or by lowering investment returns.
- **Rollover**—upon separation from a job, a participant may transfer the plan account balance to an IRA, which maintains most of the same tax preferences on the balances, move it to a new tax-qualified plan, or leave the money in the old plan. Alternatively, any cash withdrawal would likely be subject to income tax and penalties.
- **Age at retirement**—the decision as to when to retire determines how many years the worker has to accumulate plan balances and how long the money has to last in retirement.

Figure 1: Mechanics of Accumulating Retirement Savings in DC Plans



Source: GAO analysis.

There is little consensus about how much constitutes “enough” savings to have going into retirement. We may define retirement income adequacy relative to a standard of minimum needs, such as the poverty rate, or to the consumption spending that households experienced during working years.¹⁴ Some economists and financial advisors consider retirement income adequate if the ratio of retirement income to pre-retirement income—or replacement rate—is between 65 and 85 percent. Retirees may not need 100 percent of pre-retirement income to maintain living standards for several reasons. Retirees will no longer need to save for retirement, retirees’ payroll and income tax liability will likely fall, work expenses will no longer be required, and mortgages and children’s

¹⁴ Many factors affect how much a person will need: age at retirement, life expectancy, living expenses, health expenses, investment returns, inflation, and personal tolerance for risk. For summaries of this research through 2002 and 2003, see GAO, *Private Pensions: Improving Worker Coverage and Benefits*, GAO-02-225 (Washington, D.C.: April 9, 2002), pp. 41-44; and Congressional Budget Office, *Baby Boomers’ Retirement Prospects: An Overview*, November 2003.

education and other costs may have been paid off.¹⁵ However, some researchers cite uncertainties about future health care costs and future Social Security benefit levels as reasons to suggest that a higher replacement rate, perhaps above 100 percent or higher, would be considered adequate.¹⁶

To achieve adequate replacement rate levels, retirees depend on different sources of income to support themselves in retirement. Social Security benefits provide the bulk of retirement benefits for most households. As of 2004, annuitized pension benefits provided almost 20 percent of total income to households with someone age 65 or older, while Social Security benefits provided 39 percent.¹⁷ Social Security benefits compose over 50 percent of total income for two-thirds of households with someone age 65 or older, and at least 90 percent of income for one-third of such households. Table 2 shows estimated replacement rates from Social Security benefits for low and high earners retiring in 2007 and 2055, as well as the remaining amount of pre-retirement income necessary to achieve a 75 percent replacement rate.¹⁸ These figures give rough guidelines for how much retirement income workers might need from other sources, such as employer-sponsored pensions, as well as earnings and income from other savings or assets.

¹⁵ For an example of such calculations, see Alicia Munnell, Anthony Webb, and Luke Delorme; "Retirement at Risk: A New National Retirement Index," Center for Retirement Research, June 2006 available at <http://www.crr.bc.edu>. In this research, replacement rates are calculated for households with differing lifetime income levels. Lower-income households are found to need a higher replacement rate due to lower saving during working years while higher-income households need a lower replacement rate. Because higher-income households tend to save relatively more while working, once retired they will no longer need to save a relatively large fraction of income.

¹⁶ Most studies have found that at least 50 percent of households are likely to have adequate retirement income, while at least 20 percent of households are likely not to have adequate income. Research findings differ on the remaining 30 percent of households.

¹⁷ Data reported by the Social Security Administration (SSA) do not consider lump-sum withdrawals from retirement accounts, such as DC plans or IRAs, as income, and hence these statistics do not include non-annuitized savings.

¹⁸ SSA defines a low earner as someone whose career average earnings are about 45 percent of the national average wage index (AWI), while a high earner has career average earnings of about 160 percent of AWI.

Table 2: Estimated Social Security Replacement Rates for Workers Turning 65 in 2007 and in 2055, Percent of Career-Average Earnings

Source of replacement rate income	Year in which a 65 year old retires			
	2007		2055	
	Low earner	High earner	Low earner	High earner
Social Security	54.2	33.5	49.0	30.1
Replacement from other sources to achieve 75 percent replacement rate	20.8	41.5	26.0	44.9

Source: The 2007 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, Table VI.F10.

Note: Based on scheduled benefits under intermediate assumptions of Social Security projections. Replacement rates represent benefits as a percentage of career-average earnings for low and high earners.

It is important to keep certain economic principles in mind when evaluating the effectiveness of retirement accounts, or any pensions, in providing retirement income security. First, balances accumulated in a DC plan may not represent new saving; individuals may have saved in another type of account in the absence of a DC plan or its tax preferences. Second, evaluating worker income security should consider total compensation, not just employer contributions to DC plans. All else equal, we should generally expect more generous employer-sponsored pension benefits to lower cash wages and that the split between current wages and deferred compensation is largely a reflection of labor market conditions, tax provisions, and worker and employer preferences.

Many Workers Have No Plan Coverage, and Most DC Plan Participants Currently Have Modest Account Balances

Many workers do not have DC plans, and median savings levels among participants show modest balances. While it is worth noting that for workers nearing retirement age, DC plans were not considered primary pension plans for a significant portion of their working careers, participation rates and median balances in such plans are low across all ages. Only 36 percent of working individuals were actively participating in a DC plan, according to data from the 2004 SCF.¹⁹ Further, workers aged 55 to 64 had median balances totaling \$50,000 in account-based retirement savings vehicles, including DC plans and rollover accounts.²⁰ Leakage, when workers withdraw DC savings before retirement age, can also reduce balances; almost half of those taking lump-sum distributions upon leaving a job reported cashing out their balances for non-retirement purposes. Participation among lower-income workers was particularly limited, and those who did have accounts had very low balances.

Most Workers Do Not Have a Current DC Plan, and Participants Have Modest Plan Balances

The majority of workers, in all age groups, are not participating in DC plans with their current employers. Employers do not always offer retirement plans, and when they do, plans may have eligibility restrictions initially, and some eligible workers do not choose to participate.²¹ According to our analysis of the 2004 SCF, only 62 percent of workers were offered a retirement plan by their employer, and 84 percent of those offered a retirement plan participated.²² Only 36 percent of working individuals participated in a DC plan with their current employer (see fig. 2). Data indicated similar participation rates for working

¹⁹These are sample estimates based on the 2004 SCF and are subject to sampling error. Most SCF percentage estimates have 95 percent confidence intervals between plus-or-minus 4 percentage points of the percentage itself. The majority of SCF estimates of medians and means have 95 percent confidence intervals within plus-or-minus 25 percent of the estimate itself. Exceptions to these rules are presented in appendix I. The SCF is designed to produce estimates for a subset of the household, referred to as the “primary economic unit.” There are limitations in extending this to an individual or worker level of analysis. Additional details can also be found in app. I.

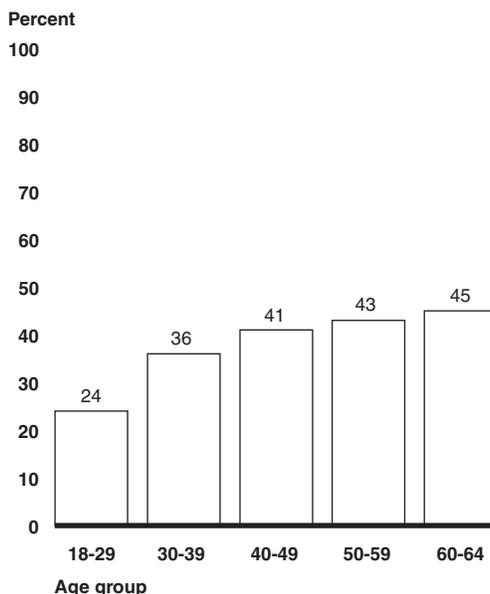
²⁰ The 95 percent confidence interval for this estimate is from \$27,594 to \$72,406. While the range is broad, this statistic still effectively illustrates the limited DC savings of those currently near retirement age.

²¹ Employees are to be eligible for pension plans once they reach one year of service or the age of 21. In order to fulfill the year of service requirement, employees must have worked for the employer for 12 months and fulfilled 1,000 hours of service.” 26 U.S.C. §§ 401(a)(3), 410(a)(1)(A) and (3)(A).

²² This participation figure includes all retirement plans, including both DB and DC plans. Because employees covered by DB plans are by definition, almost universally participants, the participation rate for DC plans is below the 84 percent figure.

households, as 42 percent of households had at least one member with a current DC plan.

Figure 2: Percentage of Working Individuals Participating in Current DC Plans by Age Group, 2004



Source: GAO analysis of 2004 Survey of Consumer Finances.

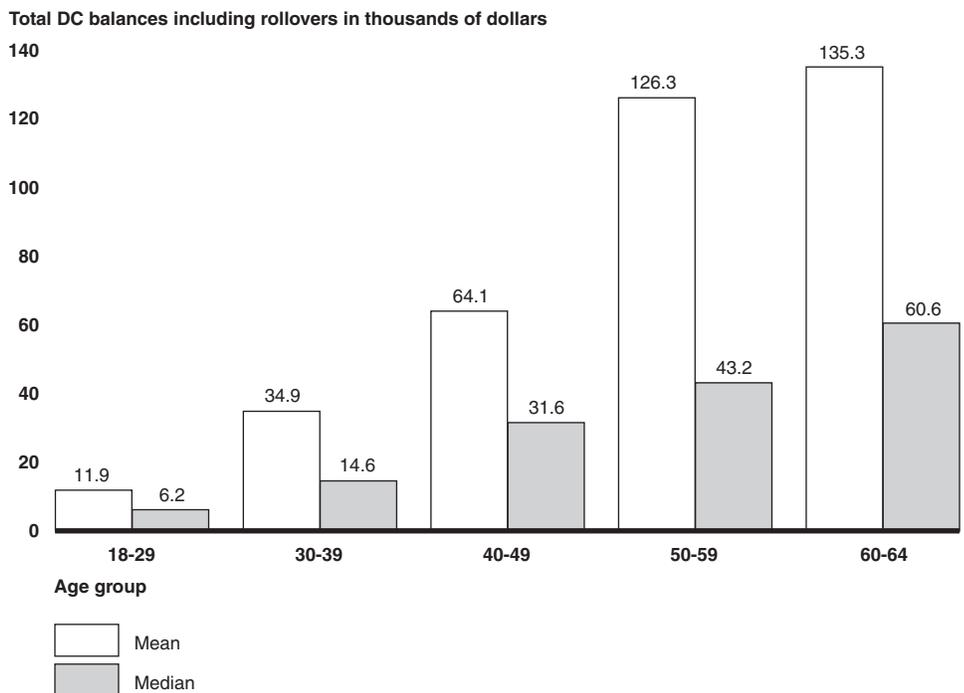
Note: Most SCF percentage estimates have 95 percent confidence intervals between plus-or-minus 4 percentage points of the percentage itself. Exceptions to this rule are presented in app. I.

For many workers who participated in a plan, overall balances in DC plans were modest, suggesting a potentially small contribution toward retirement security for most plan participants and their households. However, since DC plans were less common before the 1980s, older workers would not have had access to these plans their whole careers. In order to approximate lifetime DC balances when discussing mean and median DC balances in this report, our analysis of the 2004 SCF aggregates the “total balances” of DC plans with a current employer, DC plans with former employers that have been left with the former employer, and any retirement plans with former employers that have been rolled over into a new plan or an IRA.²³ Workers with a “current or former DC plan” refers to

²³ Retirement plans rolled over from a former employer could have originally been either DC or DB plans. Also, any retirement plans from a former employer that were converted into an annuity would not be captured in these “total balance” statistics.

current workers with one or more of those three components. For all workers with a current or former DC plan, the median total balance was \$22,800. For all households with a current or former DC plan, the median total balance was \$27,940 (see fig. 3).

Figure 3: Total DC Balances for Working Individuals with a Current or Former DC Plan, by Age Group, 2004



Source: GAO analysis of 2004 Survey of Consumer Finances.

Note: The majority of SCF estimates of medians and means have 95 percent confidence intervals within plus-or-minus 25 percent of the estimate itself. Exceptions to this rule are summarized in app. I.

For individuals nearing retirement age, total DC plan balances are still low. Given trends in coverage since the 1980's, older workers close to retirement age are more likely than younger ones to have accrued retirement benefits in a DB plan. However, older workers who will rely on DC plans for retirement income may not have time to substantially increase their total savings without extending their working careers, perhaps for several years. Among all workers aged 55 to 64 with a current or former DC plan, the median balance according to the 2004 SCF was \$50,000, which would provide an income of about \$4,400 a year, replacing

about 9 percent of income for the average worker in this group.²⁴ Among all workers aged 60 to 64 with a current or former DC plan, the median balance was \$60,600 for their accounts. Markedly higher values for mean balances versus median balances in figure 3 illustrate that some individuals in every age group are successfully saving far more than the typical individual, increasing the mean savings. These are primarily individuals at the highest levels of income.

Leakage, or cashing out accumulated retirement savings for non-retirement purposes, adversely affects account accumulation for some of those with accounts, particularly for lower-income workers with small account balances. Participants who withdraw money from a DC plan before age 59 ½ generally pay ordinary income taxes on the distributions,²⁵ plus an additional 10 percent tax in most circumstances.²⁶ Participants may roll their DC plan balances into another tax-preferred account when they leave a job, and employers are required, in the absence of participant direction, to automatically roll DC account distributions greater than \$1,000 but not greater than \$5,000 into an IRA, or to leave the money in the plan. As of 2004, 21 percent of households in which the head of household was under 59, had ever received lump-sum distributions from previous jobs' retirement plans. Among these households that received lump-sum distributions, 47 percent had cashed out all the funds, 4 percent cashed out some of the funds, and 50 percent preserved all the funds by rolling them over into another retirement account.²⁷ Workers were more likely to roll over funds when the balances are greater. Among households that had cashed out all retirement plans with former employers, the median total value of those funds was \$6,800. For households that had rolled over all

²⁴ We calculated this yearly income, as an annuity equivalent using the Thrift Savings Plan calculator (<http://calc.tsp.gov>), assuming an interest rate of 5.25 percent, single life benefits beginning at age 65, no joint survivor benefits, and level payments. The 95 percent confidence interval for this annuity estimate is from \$2,431 to \$6,377 per year for life.

²⁵ 26 U.S.C. §§ 401(a) and 408(d).

²⁶ 26 U.S.C. § 72(t). See footnote 5 above for distributions that do not trigger a 10 percent early-withdrawal additional tax.

²⁷ Households included in this analysis of lump-sum distributions are restricted to those where the head of household is under age 59 in order to approximate those that would be subject to penalties for cashing out the retirement funds. Percentages do not add up to 100 percent because of rounding.

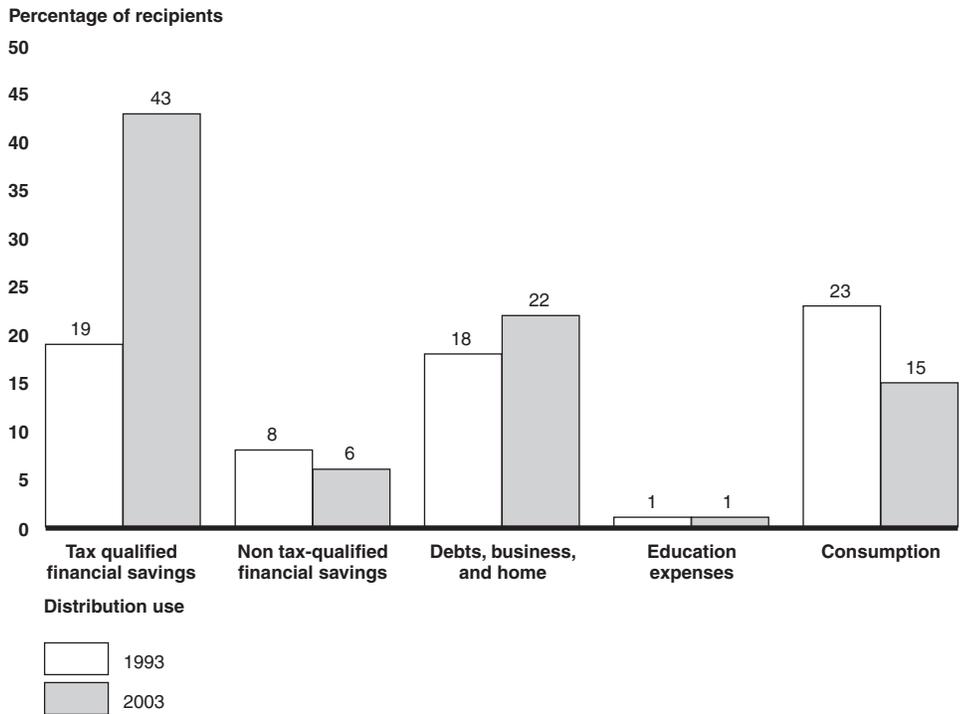
retirement plans with former employers, the median total value of rolled-over funds was \$24,200.²⁸

Some evidence suggests that pre-retirement withdrawals may be decreasing. One study finds that those receiving lump-sum distributions are more likely to preserve funds in tax-qualified accounts than they were in the past.²⁹ For example, data show that in 1993, 19 percent of lump-sum distributions recipients preserved all of their savings by rolling them into a tax-qualified account, compared to 43 percent in 2003. Further, 23 percent used all of their distribution for consumption in 1993, declining to 15 percent in 2003 (see fig. 4). According to the same study, age and size of the distribution are major determinants of whether or not the distribution is preserved in a tax-qualified account. For example, the authors found 55.5 percent of recipients aged 51 to 60 rolled their entire distribution in a tax-qualified account compared with 32.7 percent of recipients 21 to 30. Additionally, 19.9 percent of distributions from \$1 to \$499 were rolled over in tax-qualified accounts, as opposed to 68.1 percent of distributions of \$50,000 or more.

²⁸ These rollover and cash-out figures look at all cash settlements from past jobs. The SCF does not specify the original account type, so the analysis includes all retirement plans or pensions that were converted into a lump-sum distribution or settlement.

²⁹ See "Lump-Sum Distributions," *EBRI Notes*, vol. 26, No. 12 (Washington, D.C.: Dec. 2005).

Figure 4: Portion of Lump-Sum Distribution Recipients Using the Entire Portion of Their Most Recent Distribution, by Use, 1993, and 2003



Source: "Lump Sum Distributions" in Employee Benefit Research Institute Notes, Volume 26 Number 12.

Note: EBRI estimates from 2001 Panel of the Survey of Income and Program Participation Topical Module 7, 1996; Panel of the Survey of Income and Program Participation Topical Module 7, and April, 1993 Employee Benefits Supplement to the Current Population Survey.

Additionally, some participants take loans from their DC plan, which may reduce plan savings. One survey found that in 2005, 85.2 percent of employers surveyed offered a loan option.³⁰ Most eligible participants do not take loans, and one analysis finds that at the year end 2006, loans amounted to 12 percent of account balances for those who had loans.³¹ Individuals may prefer to take out pension loans in lieu of other lines of credit because pension loans require no approval and have low or no

³⁰ Profit Sharing/401(k) Council of America. "49th Annual Survey: PSCA's Annual Survey of Profit Sharing and 401(k) Plans Reflecting the 2005 Plan Experience" (Chicago, Ill.: 2006).

³¹ Jack VanDerhei, Sarah Holden, Craig Copeland, and Luis Alonso, "401(k) Plan Asset Allocation, Account Balances, and Loan Activity in 2006." EBRI, *Issue Brief*, No. 308 (Washington, D.C.: Aug. 2007).

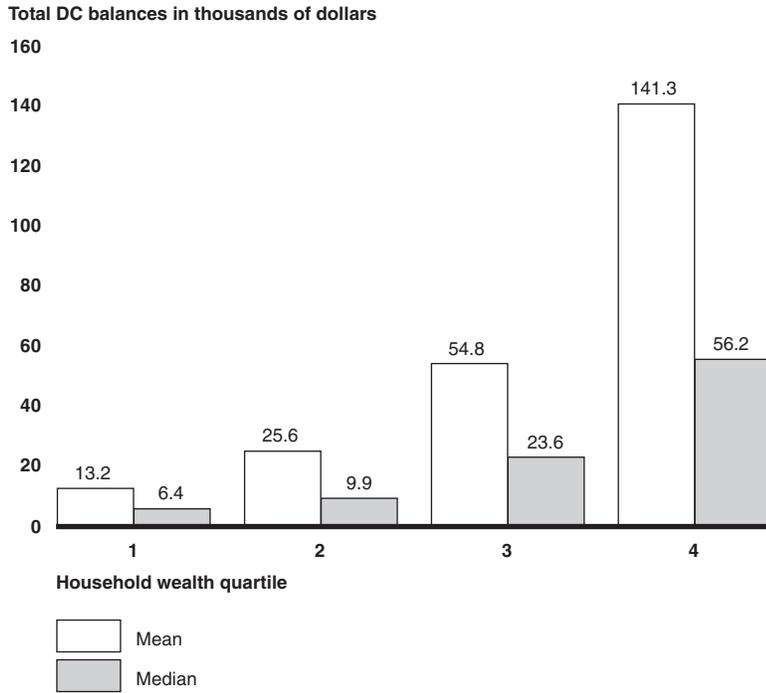
transaction costs. Borrowers also pay the loan principal and interest back to their own accounts. However, someone borrowing from a DC plan may still lose money if the interest on the loan paid back to the account is less than the account balance would have earned if the loan had not been taken. Further, loans not paid back in time, or not paid back before the employee leaves the job, may be subject to early withdrawal penalties. No data have been reported on the rate of loan defaults, but it is expected to be much lower where repayments are made by payroll withholding. However, a loan feature may also have a positive effect on participation, as some workers may choose to participate who otherwise might not, precisely because they can borrow from their accounts for non-retirement purposes at relatively low interest rates.³²

Low-Income Workers Have Particularly Low DC Plan Coverage and Plan Balances

Among workers in the lowest income quartile, only 8 percent participated in a current DC plan, a result of markedly lower access as well as lower participation than the average worker (see fig. 5). Only 25 percent of workers in the lowest income quartile were offered any type of retirement plan by their employer, and among those offered a retirement plan, 60 percent elected to participate, compared with 84 percent among workers of all income levels. Workers in the lower half of the income distribution with either current or former DC plans had total median balances of \$9,420.

³² See GAO, *401(k) Pension Plans: Loan Provisions Enhance Participation but May Affect Income Security for Some*, [GAO/HEHS-98-5](#) (Washington, D.C.; Oct. 1, 1997).

Figure 5: Total DC Plan Balances for Working Individuals with a Current or Former DC Plan, by Household Wealth Quartiles, 2004



Source: GAO analysis of 2004 Survey of Consumer Finances.

Older workers who were less wealthy also had limited retirement savings. Workers with a current or former DC plan, aged 50-59 and at or below the median level of wealth, had median total savings of only \$13,800.³³ Workers with a current or former DC plan, aged 60-64 and at or below the median level of wealth, had median total savings of \$18,000, a level that could provide at best only a limited supplement to retirement income. If converted into a single life annuity at age 65, this balance would provide only \$132 per month—about \$1,600 per year.³⁴

³³ Since some older workers may have reduced their hours or are both retired and working, they may be earning less than they had been through most of their working life. Household wealth can more accurately reflect their financial situation than income can.

³⁴ The 95 percent confidence interval for this estimate of total DC balances of workers aged 60-64 at or below the median level of wealth is from \$3,234 to \$32,766. The 95 percent confidence intervals for these annuity estimates would be from \$24 to \$240 per month or from \$285 to \$2,883 per year.

Notably, workers with low DC balances were actually less likely to have a DB pension to fall back on than workers with higher DC balances. Among all workers participating in current or former DC plans, only 17 percent of those in the bottom quartile for total plan savings also were covered by a current DB plan. In contrast, 32 percent of those in the top quartile for total DC savings also had DB coverage. Among all workers with a current or former DC plan, the plan balances for those with DB coverage were higher than for those without DB coverage. The median DC balance for workers with a DB account was \$31,560, while the median DC balance for someone without a DB account was \$20,820.

Projected DC Plan Savings Are Small for Most Workers, but Could Vary Widely Depending on Several Factors

Simulations of projected retirement savings in DC plans suggest that a large percentage of workers may accumulate enough over their careers to replace only a small fraction of their working income, although results vary widely by income levels and depend on model assumptions. Projected savings allow us to analyze how much workers might save over a full working career under a variety of conditions in a way that analyzing current plan balances cannot, since DC plans have become primary employer-sponsored plans only relatively recently. Baseline simulations of projected retirement savings for a hypothetical 1990 birth cohort indicate that DC plan savings would on average replace about 22 percent of annualized career earnings,³⁵ but provide no savings to almost 37 percent of the working population, perhaps because of different factors — working for employers who do not offer a plan, choosing not to participate, or withdrawing any accumulated plan savings prior to retirement.³⁶ Further, projected DC account balances vary widely by income quartile, with workers in the lowest-income quartile saving enough for about a 10 percent replacement rate, while those in the highest quartile saving enough for a 34 percent replacement rate, on average. Assuming

³⁵ Replacement rates equal the annuity value of DC plan balances divided by a “steady earnings” index. This index reflects career earnings, calibrated to the Social Security Administration’s age-65 average wage index (AWI). See app. I for further details about these calculations.

³⁶ We computed these results using the PENSIM simulation model, which creates a hypothetical birth cohort and models the cohort’s lives from birth to death, including all life events such as marriages, births, education and job decisions, pension coverage and behavior, and retirement. Our simulations and results exclude any DB and Social Security benefits and calculate benefits from DC plans only. Annuity amounts assume full annuitization of DC balances at retirement for a single lifetime annuity not indexed to inflation. See app. I for detailed information about the projections and input assumptions used to produce the results presented in this section.

changes in certain plan features, individual behavior, or market assumptions, such as increased participation or account rollover rates, increased projected average savings and increased the number of workers who had some DC plan savings at retirement, especially for low-income workers. Other scenarios, such as assuming higher contribution limits or delaying retirement, raised average replacement rates, but with more of the positive impact on higher-income workers and having little effect on reducing the number of workers with no savings at retirement.³⁷

Projected DC Plan Balances Vary Widely by Income, with Many Workers Having No Plan Savings at Retirement

Our projections, based on a sample of workers born in 1990, show that workers would save enough in their DC plans over their careers to produce, when converted to a lifetime annuity at the time of retirement, an average of \$18,784 per year in 2007 dollars (see table 3).³⁸ The projections assume that all workers fully annuitize all accumulated DC plans balances at retirement, which occurs sometime between age 62 and 70. Participants are assumed to always invest all plan assets in life cycle funds, and stocks earn an average real annual return of 6.4 percent. This \$18,784 annuity would replace, on average, 22.2 percent of annualized career earnings for workers in the cohort. Savings and replacement rates vary widely across income groups. Almost 37 percent of workers in this cohort have no projected DC plan savings at retirement, which brings down overall average replacement rates. Workers in the lowest income quartile accumulate DC plan savings equivalent to an annuity of about \$1,850 per year, or a 10.3 percent replacement rate, and 63 percent of this group have no plan savings by the time they retire. In contrast, highest income quartile workers save enough to receive about \$50,000 per year in annuity income, enough for a 33.8 percent replacement rate. Even in this highest-income group, over 16 percent of workers have zero plan savings at retirement. In all cases, our replacement rates include projected savings only in DC plans. Retirees may also receive benefits from DB plans, as well as from Social Security, which typically replaces a higher percentage of earnings for lower-income workers.

³⁷ Other studies that do similar DC plan balance projections that focus primarily on workers with continuous plan coverage generally find higher savings levels and replacement rates than we report in this section. We discuss these studies in more detail in app. II.

³⁸ All annuity equivalents for accumulated DC savings presented in this section are not indexed to inflation, and hence would lose purchasing power over time.

Projected household-level plan savings show a higher average replacement rate of 33.8 percent, with about 29 percent of households having no plan savings at retirement. When we assume that plan assets earn a lower average real annual return of 2.9 percent, average replacement rates from DC plan savings fall to about 16 percent for the sample.³⁹ Under this assumption, workers in the lowest-income quartile receive an average 7.1 percent replacement rate from DC plans, while highest-income quartile workers receive an average 25 percent replacement rate. Lower rates of return affect the percentage of workers with no accumulated DC plan savings only slightly, perhaps because on the margins some participants might choose (or have their employers choose) to cash out lower balances.

³⁹ This 2.9 percent annual return on assets represents a projected rate of return on U.S. Treasury bonds. While stocks have had greater long-term historical average returns, annual stock returns also exhibit more variance than Treasury bonds, and therefore we model DC plan projections under different scenarios. For more discussion of the appropriate rate to use in projections, see app. I.

Table 3: Projected Average Annuity Equivalents and Replacement Rates from DC Plan Balances at Retirement, by Income, under Baseline Assumptions

Individual-level results	Overall	By income quartile			
		1	2	3	4
Annuity equivalent (per year, 2007 dollars)	18,784	1,850	6,554	16,635	50,098
Replacement rate (percent)	22.2	10.3	18.2	26.3	33.8
Percent of workers with no DC savings	36.8	63.0	39.8	27.9	16.4
Household-level results					
Annuity equivalent (per year, 2007 dollars)	24,664	4,176	11,918	25,560	57,000
Replacement rate (percent)	33.8	18.7	30.3	40.9	45.5
Percent of workers with no DC savings	28.8	48.1	30.7	21.8	14.5
Only workers eligible for a DC plan for 15+ years					
Annuity equivalent (per year, 2007 dollars)	29,844	5,133	13,629	30,178	70,437
Replacement rate (percent)	33.5	21.7	30.2	39.7	42.3
Percent of workers with no DC savings	15.6	32.6	16.6	9.1	4.1
Only those working 25+ years full-time					
Annuity equivalent (per year, 2007 dollars)	25,533	4,447	11,407	25,610	60,668
Replacement rate (percent)	26.5	16.3	23.3	31.7	34.9
Percent of workers with no DC savings	28.8	46.7	31.8	22.8	14.5
Assuming 2.9 percent real annual return on stocks					
Annuity equivalent (per year, 2007 dollars)	13,803	1,277	4,687	12,145	37,100
Replacement rate (percent)	16.1	7.1	13.0	19.2	25.1
Percent of workers with no DC savings	37.2	63.3	40.3	28.3	16.7

Source: GAO projections using PENSIM model.

Note: All results are individual level, except as indicated. Model assumptions include the following: 1) workers fully annuitize all accumulated DC plan balances at retirement, between age 62 and 70; 2) participants invest all plan assets in life cycle funds; 3) stocks earn an average annual 6.4 percent real return, except where specified. Replacement rates equal annuitized income from lifetime DC plan savings divided by annualized career earnings. See app. I for more details.

Table 3 also shows savings statistics for sub-samples of the cohort who have a better chance of accumulating significant DC plan savings, such as those workers who have long-term eligibility to participate in a plan or who work for many years. As expected, these groups have higher projected savings; replacement rates also show more even distribution across income groups, compared to those in the full sample. However, we

still see a significant portion of the workers with no DC savings at retirement. First, we limit the sample only to those workers who are eligible to participate in a plan for at least 15 years over their careers. Average replacement rates for this group measure 33.5 percent, with rates ranging from 21.7 percent for lowest income quartile workers to 42.3 percent for the highest quartile.⁴⁰ Even with such long-term eligibility for plan coverage, however, 15.6 percent of these workers, and almost one-third of lowest-income workers, have nothing saved in DC plans at the time they retire. This could result from workers choosing not to participate or from cashing out plan balances prior to retirement.

We also analyze the prospects of workers with long-term attachment to the labor market, for which we use people who work full-time for at least 25 years, without regard to plan coverage or participation. Among these workers, average DC plan savings at retirement account for a 26.5 percent replacement rate. Still, almost 29 percent of these workers have no projected savings. This suggests that while DC plans have the potential to provide significant retirement income, saving may be difficult for some workers who work for many years, even among those whose employers offer a plan.

Universal Participation in Sponsored Plans and Universal Account Rollover Raise Projected DC Plan Savings Substantially for Lower-Income Workers

Our simulations indicate that increasing participation and reducing leakage out of DC plans may have a particularly significant impact on overall savings, especially for lower-income workers. Of the changes in the model assumptions that we simulated, these had the broadest effect on savings because they not only raised average savings for the entire sample, but had a relatively strong impact on workers in the lowest income quartile and on the number of workers with no DC plan savings at retirement. While these assumptions represent stylized scenarios, they illustrate the potential effect of such changes on savings.

We project DC plan savings assuming that all employees of a firm that sponsors a DC plan participate immediately, rather than having to wait for

⁴⁰ We recalculate income quartiles for the sub-samples, and thus the income cut-offs for each quartile differ from those in the full-sample baseline.

eligibility or choosing not to participate.⁴¹ In our baseline projections, 6 percent of workers whose employers sponsor a plan are ineligible to participate, and 33 percent of those eligible do not choose to participate; therefore, this assumption significantly raises plan participation rates among workers. Accordingly, average DC savings rise by almost 40 percent, raising average replacement rates to 35 percent, and the percentage of the population with no savings at retirement drops by half, down to 17.7 percent (see table 4).

Table 4: Projected Average Annuity Equivalents and Replacement Rates from DC Plan Balances at Retirement, by Income, under Different Model Assumptions

Baseline results, individual-level	Overall	By income quartile			
		1	2	3	4
Annuity equivalent (per year, 2007 dollars)	18,784	1,850	6,554	16,635	50,098
Replacement rate (percent)	22.2	10.3	18.2	26.3	33.8
Percent of workers with no DC savings	36.8	63.0	39.8	27.9	16.4
Instant eligibility/participation					
Annuity equivalent (per year, 2007 dollars)	26,265	4,243	11,142	24,370	65,305
Replacement rate (percent)	35.0	25.4	31.3	38.8	44.7
Percent of workers with no DC savings	17.7	30.0	18.4	13.7	8.6
Participants always roll over balances upon job separation					
Annuity equivalent (per year, 2007 dollars)	20,797	2,428	7,892	18,949	53,918
Replacement rate (percent)	25.6	13.8	22.0	30.1	36.6
Percent of workers with no DC savings	27.0	48.8	28.1	19.3	11.6

Source: GAO projections using PENSIM model.

Note: All results are individual level. Model assumptions include the following: 1) workers fully annuitize all accumulated DC plan balances at retirement, between age 62 and 70; 2) participants invest all plan assets in life cycle funds; 3) stocks earn an average annual 6.4 percent real return, except where specified. Replacement rates equal annuitized income from lifetime DC plan savings divided by annualized career earnings. See app. I for more details.

Assuming automatic eligibility and participation raises projected plan savings significantly for lower-wage workers, more than doubling the

⁴¹ While this scenario eliminates waiting periods for eligibility and participation among workers of firms that sponsor plans, it does not necessarily imply that workers are making a contribution to a plan each period, nor does it affect the likelihood that a firm will offer a DC plan. PENSIM determines periodic contribution levels among participants based on plan features and worker characteristics. See app. I.

annuity equivalent of retirement savings for the lowest-income quartile. Workers in the highest income group also increase savings under this scenario, with plan savings rising by 30 percent. This change in projected savings suggests that automatically enrolling new employees in plans as a default could have a significant positive impact on DC balances, especially for low-income workers whose jobs offer a plan, although this stylized scenario likely describes a more extreme change in eligibility and participation than plans are likely to implement under automatic enrollment, and that higher participation and savings would raise employer's pension costs, perhaps leading to a reduction in benefits or coverage.

Another stylized scenario we model assumes that all workers who have a DC plan balance always keep the money in a tax-preferred account upon leaving a job, either by keeping the money in the plan, transferring it to a new employer plan, or rolling it into an IRA, rather than cashing out any accumulated savings.⁴² Eliminating this source of leakage raises average annuity income from DC plans by almost 11 percent and average replacement rates from 22.2 percent in the baseline to 25.6 percent; it also reduces the percentage of the cohort with no DC savings at retirement by over 25 percent. As with the instant participation scenario, "universal rollover" raises annuity savings and reduces the number of retirees with zero plan savings by the biggest percentages among lower-income workers, suggesting that cashing out accumulate plan savings prior to retirement may be a more significant drain on retirement savings for these groups. These results indicate that policies to encourage participants to keep DC plan balances in tax-preferred retirement accounts, perhaps by making rollover of plan assets a default action in plans, may have a broad positive impact on retirement savings.

Changing Retirement Decisions or Contribution Limits Would Affect Savings Primarily for Higher-Income Workers

Other changes we make in our projections related to plan features or individual behavior affect average replacement rates overall, but with less impact on lower-income workers' replacement rates and on the number of workers with zero plan savings at retirement. These scenarios include assumed changes in annual contribution limits and retirement decisions (see table 5).

⁴² In our baseline scenario, workers cash out account balances 36 percent of the time when leaving a job.

Table 5: Projected Average Annuity Equivalents and Replacement Rates from DC Plan Balances at Retirement, by Income, Under Different Model Assumptions

Baseline results, individual-level	By income quartile				
	Overall	1	2	3	4
Annuity equivalent (per year, 2007 dollars)	18,784	1,850	6,554	16,635	50,098
Replacement rate (percent)	22.2	10.3	18.2	26.3	33.8
Percent of workers with no DC savings	36.8	63.0	39.8	27.9	16.4
Raise annual contribution limits					
Annuity equivalent (per year, 2007 dollars)	21,056	1,879	6,583	16,999	58,763
Replacement rate (percent)	23.6	10.5	18.3	26.9	38.5
Percent of workers with no DC savings	36.7	63.0	39.9	27.9	16.2
Workers delay retirement 1 year					
Annuity equivalent (per year, 2007 dollars)	19,873	1,876	6,895	17,826	52,895
Replacement rate (percent)	23.3	10.5	19.0	28.0	35.6
Percent of workers with no DC savings	36.9	63.5	40.3	27.2	16.3
Workers delay retirement 3 years					
Annuity equivalent (per year, 2007 dollars)	22,710	2,151	7,623	19,897	61,170
Replacement rate (percent)	25.7	12.1	20.7	30.5	39.4
Percent of workers with no DC savings	36.8	63.1	39.9	28.5	15.7

Source: GAO calculations using projected savings from PENSIM model.

Note: All results are individual level. Model assumptions include the following: 1) workers fully annuitize all accumulated DC plan balances at retirement, between age 62 and 70; 2) participants invest all plan assets in life cycle funds; 3) stocks earn an average annual 6.4 percent real return, except where specified. Replacement rates equal annuitized income from lifetime DC plan savings divided by annualized career earnings. See app. I for more details.

We model projected retirement savings assuming that annual DC contribution limits for employees rise from \$15,500 to \$25,000, and the combined employer-employee maximum contribution level rises from \$45,000 to \$60,000, starting in 2007.⁴³ Higher annual maximum contributions affect projected savings almost exclusively among the highest-income group, indicating that few workers earning less are likely

⁴³ The baseline projections assume that annual contribution limits continue to rise in the future from 2007 limits of \$15,500 for employee contributions and \$45,000 for combined employer-employee contributions.

to contribute at existing maximum levels. The highest income quartile replacement rises from 33.8 to 38.5 percent, while replacement rates hardly change in the lower income groups. Similarly, this scenario has almost no impact on the percentage of workers with DC plan savings at retirement.

Finally, we model retirement savings in two scenarios in which workers delay retirement by 1 or 3 years. Encouraging workers to retire later has been suggested as a key element in improving retirement income security, by increasing earnings, allowing more time to save for retirement, and reducing the length of retirement. In our projections, delaying retirement not only provides more years to contribute to and earn returns on plan balances but also might raise annual retirement income because older retirees receive more annuity income for any given level of savings, holding all else equal. In our projections, working longer modestly raises retirement savings in our projections. Working one extra year changes projected annuity income by 5.8 percent, but has little effect on the percentage of people with no DC savings in our projections. Delaying retirement by 3 years raises annuity income from DC plans by 20.9 percent on average, with replacement rates rising from 22.2 percent in the baseline to 25.7 percent overall.⁴⁴ The 3-year delay increases annuity levels somewhat evenly across income groups, with higher-income workers showing slightly higher increases. Overall, working an extra 3 years raises average replacement rates about as much as universal account rollover would, but with little reduction in workers with no retirement savings. Thus, while working longer would likely raise workers' incomes, and in most cases retirement benefits from other sources such as Social Security, our projections show that this change alone would have a modest impact on retirement income from DC plans, particularly regarding lower-income workers and those not already saving in DC plans in the baseline.

⁴⁴ We would expect the effect on annuity income to exceed that on replacement rates because working longer may also raise our measure of career earnings that we use in the denominator of the replacement rate calculation.

Recent Changes and Proposals Could Have Positive Effects on DC Plan Coverage, Participation, and Savings

Recent regulatory and legislative changes and proposals could have positive effects on DC plan coverage, participation, and saving. The Pension Protection Act of 2006 (PPA) facilitated the adoption of automatic plan features by plan sponsors that may increase DC participation and savings within existing plans.⁴⁵ Proposals to expand the saver's credit could similarly encourage greater contributions by low-wage workers who are already covered by a DC plan. Other options, like the so-called "State-K" proposal, in which states would design and partner with private financial institutions to offer low-cost DC plans employers could provide to employees, would seek to expand coverage among workers without current plans by encouraging employers to sponsor new plans. Other options would try to increase retirement account coverage by increasing the use of IRAs or creating new retirement savings vehicles outside of the voluntary employer-sponsored pension framework. Such proposals include automatic IRAs, in which employers would be required to allow employees through automatic enrollment to contribute to IRAs by direct payroll deposit, or universal accounts proposals, in which all workers would be given a retirement account regardless of whether they had any employment based pension coverage.

Changing Default Plan Features and Reforming Saver's Credit Could Raise DC Plan Savings, but May Have Limited Impact on Coverage

Changing certain traditional DC plan defaults may have a significant impact on DC participation and savings. Research suggests that employees exhibit inertia regarding plan participation and contributions, which can reduce DC savings by failure to participate or increase savings over time.⁴⁶ To reverse the effects of these tendencies, some experts have suggested changing default plan actions to automatically sign up employees for participation, escalate contributions, and set default investment options unless workers opt out.⁴⁷ Some studies have shown that automatic enrollment may increase DC plan participation. For example, one study of a large firm, automatic enrollment increased participation from 57 percent

⁴⁵ Pub. L. No. 109-280, § 902, 120 Stat. 780, 1033-39.

⁴⁶ Jodi DiCenzo, "Behavioral Finance and Retirement Plan Contributions: How Participants Behave, and Prescriptive Solutions," EBRI *Issue Brief* No. 301 (Washington, D.C.: Jan. 2007).

⁴⁷ See William G. Gale, J. Mark Iwry, and Peter R. Orszag, "The Automatic 401(k): A Simple Way to Strengthen Retirement Savings," The Retirement Security Project, No. 2005-1 (Washington, D.C.: Mar. 2005); and William G. Gale, J. Mark Iwry, and Spencer Walters, "Retirement Saving for Middle- and Lower-Income Households: The Pension Protection Act of 2006 and the Unfinished Agenda," The Retirement Security Project, No. 2007-1 (Washington, D.C.: 2007).

for employees eligible to participate 1 year before the firm adopted automatic enrollment to 86 percent for those hired under automatic enrollment.⁴⁸ Another study finds that, prior to automatic enrollment, 26 to 43 percent of employees at 6 months' tenure participated in the plan at three different companies; under automatic enrollment 86 to 96 percent of employees participated.⁴⁹ Some also advocate automatically rolling over DC savings into an IRA when employees separate from their employers to further increase retirement savings. Our own simulations shows that universal account rollover to a tax-preferred account, such as a new plan or an IRA, would increase projected retirement savings by 11 percent on average, with the biggest percentage increases for lowest-income workers.

Various regulatory and legislative changes have focused on default DC plan features. In 1998, the IRS first approved plan sponsor use of automatic enrollment—the ability for plans to automatically sign employees up for a 401(k) plan (from which the employee can opt out), and—subsequently issued several rulings that clarified the use of other automatic plan features and the permissibility of automatic features in 403(b) and 457 plans.⁵⁰ Accordingly, the percentage of 401(k) plans using

⁴⁸ Brigitte C. Madrian and Dennis F. Shea. “The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior.” *The Quarterly Journal of Economics*, vol. 116, Issue 4 (Nov. 2001). The authors compare participation rates for those hired at a large firm in the health-care and insurance industry, before automatic enrollment (with 1 year of service required to be eligible), and those hired after automatic enrollment (with immediate eligibility for all employees, and all newly hired employees auto-enrolled).

⁴⁹ Our simulation projections show that immediate plan eligibility and participation would increase the average annuity equivalent of retirement savings for workers by almost 40 percent, with replacement rates for lowest-income quartile workers' savings growing from 10.3 percent in our baseline model to 25.4 percent. This simulation undoubtedly overstates the effect of auto enrollment provisions under PPA; since employers are not compelled to offer auto enrollment, it may apply only to new employees, and it is difficult to predict the effect of auto enrollment on employer's willingness to sponsor a plan.

⁵⁰ See Rev. Rul. 98-30 and 1998-1 C.B. 1273. In 2000, additional rulings provided that various automatic plan features were permissible, including automatic enrollment of both newly hired employees and nonenrolled incumbent employees, and automatic enrollment in 403(b) and 457, as well as in 401(k), plans, and allowed automatic investment. See Rev. Rul. 2000-8, 2000-1 C.B. 617, Rev. Rul. 2000-35, 2000-2 C.B. 138; Rev. Rul. 2000-33, and 2000-1 C.B. 142. However, there was no certainty regarding the extent to which employers would face greater exposure to liability for losses to employee accounts due to default investment choices in automatic enrollment plans. The PPA addressed this uncertainty by directing the Department of Labor to provide a measure of additional protection to plan fiduciaries that use certain kinds of default investments, PPA § 624, 120 Stat. 980 and 72 Fed. Reg. 60,452 (Oct. 24, 2007), and the Department recently issued final regulations providing such protection.

automatic plan features has increased in recent years. One annual study of plan sponsors found that in 2004, 12.4 percent of 401(k) plans were automatically enrolling participants, and this number increased to 17.5 percent of plans in 2005.⁵¹ The percentage of plans automatically increasing employee contributions also rose from 6.8 percent in 2004 to 13.6 percent in 2005. Some experts have argued that initially, some plan sponsors may have been hesitant to use automatic plan features because of legal ambiguities between state and federal law. However, clarifications relating to automatic enrollment and default investment in the PPA have led some plan sponsors and experts to expect more plans to adopt automatic plan features.⁵²

Automatic DC plan features, however, may create complications for sponsors and participants that may limit any effect on savings and participation. Auto enrollment may not help expand plan sponsorship; in fact, sponsors who offer a matching contribution may not want to offer automatic enrollment if they believe this will raise their pension costs.⁵³ Also, if sponsors automatically invest contributions in a low-risk fund such as a money market fund, this could limit rates of return on balances. However, choosing a risky investment fund could subject automatic contributions to market losses.⁵⁴ Some employees may not realize they

⁵¹ See Profit Sharing/401(k) Council of America. "48th Annual Survey of Profit Sharing and 401(k) Plans Reflecting 2004 Plan Experience" (Chicago, Ill.: 2005); and "49th Annual Survey: PSCA's Annual Survey of Profit Sharing and 401(k) Plans Reflecting the 2005 Plan Experience" (Chicago, Ill.: 2006, August 2007).

⁵² For instance, PPA specified that the Employee Retirement Income Security Act of 1974 (ERISA) pre-empted state payroll or anti-garnishment laws that might be interpreted to prohibit automatic deferral of employees pay. PPA § 902(f), 120 Stat. 1039.

⁵³ One recent study suggests the absence of an employer match in an automatic-enrollment 401(k) scheme has little impact on participation. Thus, the authors suggest that a non-matching automatic-enrollment type scheme, such as an automatic IRA, could have a significant impact on participation and savings. This study finds that the absence of an employer match in an automatic 401(k) plan only modestly decreases participation, implying that an automatic payroll deposit plan such as an IRA could be successful in increasing participation even without an employer match. (John Beshears et al. "The Impact of Employer Matching on Savings Plan Participation Under Automatic Enrollment." National Bureau of Economic Research, Working Paper 13352, August 2007.)

⁵⁴ The Department of Labor's final regulation regarding default contributions, which is to take effect December 24, 2007, specifies what constitutes a "qualified default investment alternative," which includes life cycle funds, balanced funds, and managed accounts, as well as grandfathered and short-term principal preservation funds. 72 Fed. Reg. 60,470-80.

have been signed up for a plan, and may be displeased to discover this, particularly if their automatically invested contributions have lost money.⁵⁵

Proposals Seek to Increase Plan Coverage and Savings, Particularly for Lower-Income Workers

Other proposals would target plan formation or increase participation and retirement savings by expanding worker access to other account-based retirement savings vehicles like IRAs. Some of these alternative retirement savings proposals are voluntary in design, while others are more universal.

State-K: The State-K proposal aims to make low-cost retirement plans available to employers who do not otherwise sponsor a plan.⁵⁶ Under a State-K program, state government entities would design and administer a 401(k) plan that an employer within the state could choose to offer its employees. By pooling resources and sharing costs across many different employers, states would seek to create a lower-cost plan that employers, particularly smaller ones, that do not sponsor any plan might find attractive enough to adopt and offer to their employees. In one proposed program from Maryland, expenses to implement, maintain, and administer the plan would be paid from contributions to, or income or assets of, the program.⁵⁷ The 401(k) designs made available by a State-K program would use automatic enrollment and low-cost default investment, with limited and simple features to minimize administrative costs and simplify choices for employers and employees. Contributions accumulated by these State-K funds would be kept separate from state employee retirement plan funds, but State-K funds could be pooled in order to lower overall plan investment costs. By decreasing the costs and assisting small employers with compliance and plan administration, the State-K could be expected to increase incentives for employers to sponsor plans, thus increasing

⁵⁵ PPA specifies that each employee will be given ninety days to withdraw from the automatic enrollment plan and distributions taken within this time period will be penalty free. PPA § 902, 120 Stat. 780, 1033-39.

⁵⁶ Several states have proposed or have been exploring State-Ks, including Washington, Maryland, Michigan, and Vermont. For additional information on the State-K concept, see J. Mark Iwry, "State-K: A Strategy for Using State-Assisted Saving to Expand Private Pension Coverage." Supplemental Written Testimony before the Sub-Committee on Long-Term Growth and Debt Reduction of the Committee on Finance, US Senate. Jun. 29, 2006; and J. Mark Iwry, "Growing Private Pensions: A Supporting Role for the States," *BNA Tax Management Compensation Planning Journal*, vol. 34, no. 12 (Washington, D.C.: Dec. 1, 2006).

⁵⁷ H.B. 1414, 423^d Gen. Assem., Reg. Sess. (Md. 2006).

employee access to account-based retirement plans. However, it is unclear to what extent employers would adopt such plans.

The Automatic IRA: The Automatic IRA proposal would make direct deposit or payroll deduction saving into an IRA available to all employees by requiring employers that do not sponsor any retirement plan to offer withholding to facilitate employee contributions. To maximize participation, employees would be automatically enrolled at 3 percent of pay, or could elect to opt out or to defer a different percentage of pay to an IRA, up to the maximum IRA annual contribution limit (\$4,000 for 2007; \$5,000 for 2008). Employers would not be required choose investments or set up the IRAs, which would be provided mainly by the private-sector IRA trustees and custodians that currently provide them. Employers also would not be required or permitted to make matching contributions, and would not need to comply with the Employee Retirement Income Security Act of 1974 (ERISA) or any qualified plan standards such as non-discrimination requirements. Employers, however, would be required to provide notice to employees, including information on the maximum amount that can be contributed to the plan on an annual basis.⁵⁸ One congressional proposal would require employers, other than small or new ones, to offer payroll deposit IRA arrangements to employees not eligible for pension plans and permit automatic enrollment in such IRAs in many circumstances. Participating IRAs would be required to offer a default investment consisting of life cycle funds similar to those offered by the

⁵⁸ See J. Mark Iwry and David C. John, Testimony Before the Subcommittee on Health, Employment, Labor, and Pensions of the House Education and Labor Committee (Nov. 8, 2007) and “Pursuing Universal Retirement Security Through Automatic IRAs,” Retirement Security Project, No. 2007-2 (Washington, D.C.: 2007). The automatic IRA proposal differs from existing employment-based IRAs, such as the SEP-IRA and SIMPLE IRAs, which require employer contributions. In the SEP, small business employees 21 and over who have worked at least 3 of the past 5 years for the employer, and who earn at least \$450 qualify. 26 U.S.C. § 408(k). Contributions cannot discriminate in favor of highly compensated employees. SIMPLE plans can be adopted by employers who have no more than 100 employees who earned at least \$5,000 the previous year. 26 U.S.C. § 408(p). In 2007, employee contributions to a SIMPLE IRA were limited to \$10,500, including elective deferrals and employer deferrals. Employers must either match employee contributions dollar for dollar up to 3 percent of pay, with the option of contributing as little as 1 percent of pay for 2 out of 5 years, or make automatic non-elective contributions to employee accounts of 2 percent of pay. In addition, employers can also allow employees to make direct payroll contributions to IRAs without making matching contributions to the IRA. 26 U.S.C. § 408(q).

Thrift Savings Plan, the DC plan for federal workers, or other investments specified by a new entity established for that purpose.⁵⁹

Universal accounts: Similar to the automatic IRA, universal account (UA) proposals aim to establish retirement savings accounts for all workers, and vary slightly based on employment-based pension access. Additionally, some proposals would have employers contribute to the account, whereas other proposals would also have the federal government match contributions. One proposal suggests a 2 percent annual contribution from the federal government regardless of individual contributions, while another would provide for individual contributions only, capped at \$7,500 per year.⁶⁰ In 1999, the Clinton Administration proposed a UA to be established for each worker and spouse with earnings of at least \$5,000 annually. Individuals would receive a tax credit of up to \$300 annually. Additionally, workers could voluntarily contribute to the account up to specified amounts with a 50 to 100 percent match by the federal government.⁶¹ This match would come in the form of a tax credit, and total voluntary contributions, including government contributions, would be limited to \$1,000. Both the credit and the match would phase out as income increases, providing a progressive benefit and targeting low- and middle-income workers. Federal contributions would have revenue implications, while requiring employer contributions could increase employer compensation costs.

Other proposals would expand the size and scope of the saver's credit to encourage greater contributions by those low-wage workers who are already covered by a DC plan that allows employee contributions. Currently, the saver's credit, originally proposed in 2000 as an outgrowth of the 1999 UA proposal as a government matching deposit on some voluntary contributions to IRAs and 401(k) plans, provides a nonrefundable tax credit to low- and middle-income savers of up to 50

⁵⁹ Automatic IRA Act of 2007, S. 1141, 110th Congress (as introduced April 18, 2007) and H.R. 2167, 110th Congress (as introduced May 3, 2007).

⁶⁰ See David M. Walker, "Fiscal and Retirement Challenges." Presentation to the UJA Foundation of New York, September 2007, and Burman, Leonard E, William G. Gale and Peter R. Orszag. "The Administration's Savings Proposals: Preliminary Analysis." *Tax Analysts*, 2003.

⁶¹ See GAO, *Social Security: Evaluating Reform Proposals*. [GAO/AIMD/HEHS-00-29](#) (Washington, D.C.; Nov. 4, 1999). See also U.S. Department of the Treasury, General Explanations of the Administration's Fiscal Year 2001 Revenue Proposals (Feb. 2000), pages 49-52.

percent of their annual IRA or 401(k) contributions of up to \$2,000. However, according to one analysis, because the credit is nonrefundable, only about 17 percent of those with incomes low enough to qualify for the credit would receive any benefit if they contributed to a plan. Some analysts think that expanding the saver's credit, or creating direct transfers such as tax rebates or deposits into retirement savings accounts, could increase plan contributions specifically for low- and middle-income workers.⁶² Making the saver's credit refundable to the participant could also provide a direct transfer to the tax filer in lieu of a retirement account match, but offers no assurance that funds would be saved or deposited into a retirement account.⁶³ A refundable tax credit would also have revenue implications for the federal budget.

Concluding Observations

The DC plan has clearly overtaken the DB plan as the principal retirement plan for the nation's private sector workforce, and its growing dominance suggests its increasingly crucial role in the retirement security of current and future generations of workers. The current DC-based system faces major challenges, like its DB-based predecessor, in terms of coverage, participation, and lifetime distributions. Achieving retirement security through DC plans carries particular challenges for workers, since accumulating benefits in an account-based plan requires more active commitment and management from individuals than it does for DB

⁶² See William G. Gale, J. Mark Iwry, and Peter R. Orszag, "The Saver's Credit: Issues and Options," (Washington, D.C.: May 3, 2004). One field experiment examined savings behavior for tax filers who were given the opportunity to open and contribute to an account, including an IRA, at the time of tax filing. Some of these filers were offered a match with a structure similar to the saver's credit that directly deposited funds into the account for the filers. Before the experiment, about 2 percent of all filers opened such an account, and average contributions for all taxpayers who opened an account were about \$382. During the experiment, about 3 percent of those not offered a match opened an account and contributed an average of \$765, about 8 percent of those offered a 20 percent match opened an account and contributed an average of \$1,102, and about 14 percent of those offered the 50 percent match opened an account and contributed an average of \$1,108. See Esther Duflo et al. "Saving Incentives for Low- and Middle-Income Families: Evidence from a Field Experiment with H&R Block." National Bureau of Economic Research, Working Paper 11680. Sept. 2005.

⁶³ See William G. Gale, J. Mark Iwry, and Peter Orszag. "Improving Tax Incentives for Low-Income Savers: The Saver's Credit." Urban Institute, Discussion Paper No. 22, page 13, and footnote 43 (Washington, D.C.: Jun. 2005).

participants. Since workers must typically sign up and voluntarily reduce their take home pay to contribute to their DC plans, invest this money wisely over their working years, and resist withdrawing from balances prior to retirement, it is perhaps to be expected that even those who have the opportunity to participate save little. While our results on both current and projected plan balances suggest that while some workers save significant amounts toward their retirement in DC plans, a large proportion of workers will likely not save enough in DC plans for a secure retirement.

Of particular concern are the retirement income challenges faced by lower earners. Many of these workers face competing income demands for basic necessities that may make contributions to their retirement plans difficult. Further, the tax preferences that may entice higher-income workers to contribute to their DC plans may not entice low-income workers who have plan coverage, since these workers face relatively low marginal tax rates. Our model results suggest that other measures, such as automatic enrollment and rollover of funds may make a difference for some lower income workers. Should pension policy, as embodied by the automatic provisions in PPA, continue to move in this direction, it should focus on those workers most in need of enhanced retirement income prospects.

Agency Comments

We provided a draft of this report to the Department of Labor and the Department of the Treasury, as well as to five outside reviewers. Neither agency provided formal comments. We incorporated any technical comments we received throughout the report as appropriate.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution until 30 days after the date of this letter. At that time, we will send copies of this report to the Secretary of Labor, the Secretary of the Treasury, appropriate congressional committees, and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on GAO's website at <http://www.gao.gov>.

If you have any questions concerning this report, please contact Barbara Bovbjerg at (202) 512-7215. Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Barbara D. Bovbjerg". The signature is written in a cursive style with a large, prominent initial "B".

Barbara D. Bovbjerg
Director
Education, Workforce, and Income Security Issues

Appendix I: Scope and Methodology

To analyze saving in DC plans, we examined data from the Federal Reserve Board's Survey of Consumer Finances (SCF). This triennial survey asks extensive questions about household income and wealth components. We used the latest available survey, from 2004. The SCF is widely used by the research community, is continually vetted by the Federal Reserve and users, and is considered to be a reliable data source. The SCF is believed by many to be the best source of publicly available information on household finances. Further information about our use of the SCF, including sampling errors, as well as definitions and assumptions we made in our analysis are detailed below. We also reviewed published statistics in articles by public policy groups and in academic studies.

To analyze how much Americans can expect to save in DC plans over their careers and the factors that affect these savings, we used the Policy Simulation Group's (PSG) microsimulation models to run various simulations of workers saving over a working career, changing various inputs to model different scenarios that affect savings at retirement. PENSIM is a pension policy simulation model that has been developed for the Department of Labor to analyze lifetime coverage and adequacy issues related to employer-sponsored pensions in the United States. We projected account balances at retirement for PENSIM-generated workers under different scenarios representing different pension features, individual behavioral decisions, and market assumptions. See below for further discussion of PENSIM and our assumptions and methodologies.

To analyze those plan- or government-level policies that might best increase participation and savings in DC plans, we synthesized information gathered from interviews of plan practitioners, financial managers, and public policy experts, as well as from academic and policy studies on DC plan participation and savings. We also researched current government initiatives and policy proposals to broaden participation in account-based pension plans and increase retirement savings.

We conducted our work from July 2006 to October 2007 in accordance with generally accepted government auditing standards.

Methodology and Assumptions Using Survey of Consumer Finances Data

The 2004 SCF surveyed 4,522 households about their pensions, incomes, labor force participation, asset holdings and debts, use of financial services, and demographic information. The SCF is conducted using a dual-frame sample design. One part of the design is a standard, multi-stage area-probability design, while the second part is a special oversample of relatively wealthy households. This is done in order to accurately capture financial information about the population at large as well as characteristics specific to the relatively wealthy. The two parts of the sample are adjusted for sample nonresponse and combined using weights to provide a representation of households overall. In addition, the SCF excludes people included in the Forbes Magazine list of the 400 wealthiest people in the United States. Furthermore, the 2004 SCF dropped three observations from the public data set that had net worth at least equal to the minimum level needed to qualify for the Forbes list.

The SCF is a probability sample based on random selections, so the 2004 SCF sample is only one of a large number of samples that might have been drawn. Since each sample could have provided different estimates, we express our confidence in the precision of our particular sample's results as a 95 percent confidence interval (e.g., plus or minus 4 percentage points). This is the interval that would contain the actual population value for 95 percent of the samples we could have drawn. As a result, we are 95 percent confident that each of the confidence intervals in this report will include the true values in the study population.

All percentage estimates based on GAO analysis of 2004 SCF data used in this report have 95 percent confidence intervals that are within plus-or-minus 4 percentage points, with the following exceptions described in table 6 below.

Table 6: Sampling Errors Greater than 4 Percentage Points for Percentage Estimates at the 95 Percent Confidence Interval

Estimate	Value	Sampling error
Percentage of workers aged 60-64 participating in current DC plans	45	+/- 7.6
Percentage of households who had previously received lump-sum distributions who cashed out all funds	47	+/- 4.7
Percentage of households who had previously received lump-sum distributions who rolled over all funds	50	+/- 4.3
Percentage of workers, in the lowest income quartile and offered a retirement plan, participating in current DC plans	60	+/- 5.8

Source: GAO analysis of 2004 SCF data.

Other numerical estimates based on GAO analysis of 2004 SCF data used in this report have 95 percent confidence intervals that are within 25 percent of the estimate itself, with exceptions described in table 7.¹

Table 7: Sampling Errors Greater Than 25 Percent for Numerical Estimates at the 95 Percent Confidence Interval

	Estimate (2003 dollars)	Sampling error (Plus or minus)
Median total DC balances for all workers with either a current or former DC plan	24,200	+/-5,303
Median total DC balances for all households with either a current or former DC plan	27,940	+/-4,762
Median total DC balances for workers with either a current or former DC plan (aged 18-29)	6,160	+/-3,791
Median total DC balances for workers with either a current or former DC plan (aged 30-39)	14,580	+/-2,852
Median total DC balances for workers with either a current or former DC plan (aged 40-49)	31,580	+/-7,460
Median total DC balances for workers with either a current or former DC plan (aged 50-59)	43,200	+/-12,113
Median total DC balances for workers with either a current or former DC plan (aged 60-64)	60,600	+/-23,435
Mean total DC balances for workers with either a current or former DC plan (aged 18-29)	11,865	+/-2,507
Mean total DC balances for workers with either a current or former DC plan (aged 30-39)	34,851	+/-6,507
Mean total DC balances for workers with either a current or former DC plan (aged 40-49)	64,124	+/-8,271
Mean total DC balances for workers with either a current or former DC plan (aged 50-59)	126,301	+/-25,156
Mean total DC balances for workers with either a current or former DC plan (aged 60-64)	135,299	+/-34,933
Median total DC balances for workers with either a current or former DC plan (aged 55-64)	50,000	+/-22,406
Median Total of Cashed Out Funds for households that cashed out all lump sum distributions	6,800	+/-1,429
Median Total of Rolled Over Funds for households that rolled over all lump sum distributions	24,200	+/-5,303
Median total DC balances for workers of median income or lower with either a current or former DC plan	9,420	+/-2,165
Median total DC balances for workers of median wealth or lower with either a current or former DC plan (aged 50-59)	13,800	+/-5,244
Median total DC balances for workers of median wealth or lower with either a current or former DC plan (aged 60-64)	18,000	+/-14,766
Median total DC balances for workers with either a current or former DC plan (with a DB plan)	20,820	+/-2,652
Median total DC balances for workers with either a current or former DC plan (without a DB plan)	31,560	+/-7,640

Source: GAO analysis of 2004 SCF data.

Note: We calculated monthly and yearly incomes as annuity equivalents using the Thrift Savings Plan calculator (<http://calc.tsp.gov>), assuming an interest rate of 5.250 percent, single life benefits beginning at age 65, no joint survivor benefits, and level payments.

¹ Other estimates would include estimated means, medians, or projected annuities based on an estimated median account balance.

Because of the complexity of the SCF design and the need to suppress some detailed sample design information to maintain confidentiality of respondents, standard procedures for estimate of sampling errors could not be used. Further, the SCF uses multiple imputations to estimate responses to most survey questions to which respondents did not provide answers. Sampling error estimates for this report are based on a bootstrap technique using replicate weights to produce estimates of sampling error that account for both the variability due to sampling and due to imputation.²

The SCF collects detailed information about an economically dominant single individual or couple in a household (what the SCF calls a primary economic unit), where the individuals are at least 18 years old. We created an additional sample containing information on 7,471 individuals by separating information about respondents and their spouses or partners and considering them separately. When we discuss individuals in this document, we are referring to this sample. When we refer to all workers, we are referring to the subpopulation of workers within this individual sample. In households where there are additional adult workers, beyond the respondent and the spouse or partner, who may also have earnings and a retirement plan, information about these additional workers is not captured by the SCF and is therefore not part of our analysis. It is also important to note that the SCF was designed to be used as a household survey, and some information could not be broken into individual-level information. Where that was the case, we presented only household-level information.

We defined “worker” relatively broadly and opted to begin with the set of all those who reported that they were both working and some other activity, including for example, “worker plus disabled” and “worker plus retired.” We then excluded those workers who reported that they were self-employed from our analysis. Our definition of DC plans includes the following plans: 401(k); 403(b); 457; thrift/savings plan; profit-sharing plan; portable cash option plan; deferred compensation plan, n.e.c.; SEP/SIMPLE; money purchase plan; stock purchase plan; and employee stock ownership plan (ESOP).

² Additional information and details about this technique are available from the Federal Reserve Board, <http://www.federalreserve.gov/pubs/oss/oss2/about.html>.

The SCF and other surveys that are based on self-reported data are subject to several other sources of nonsampling error, including the inability to get information about all sample cases; difficulties of definition; differences in the interpretation of questions; respondents' inability or unwillingness to provide correct information; and errors made in collecting, recording, coding, and processing data. These nonsampling errors can influence the accuracy of information presented in the report, although the magnitude of their effect is not known.

Our analysis of the 2004 SCF yielded slightly lower participation rates than other data sets that consider pensions. For example, 2004 Bureau of Labor Statistics (BLS) data indicate a somewhat higher rate of active participation in DC accounts, 42 percent, compared with our finding of 36 percent. One possible factor contributing to this difference is that BLS surveys establishments about their employees, while SCF surveys individuals who report on themselves and their households; it is possible that the SCF respondents may be failing to report all retirement accounts, while BLS is capturing a greater proportion of them. Also, the SCF considered both public and private sector workers, while the BLS statistic is only for private sector workers. Differences may also be explained by different definitions of workers and participation, question wording, or lines of questioning. The SCF appears to provide a lower bound on the estimation of pension coverage among 4 major data sets.³

³ Comparison data sets are the Survey of Income and Program Participation, the Current Population Survey, and the Department of Labor Form 5500 series. See Geoffrey Sanzenbacher, "Estimating Pension Coverage Using Different Data Sets," Center for Retirement Research, August 2006, for additional discussion on this topic.

Methodology and Assumptions Using PENSIM Microsimulation Model

To project lifetime savings in DC pensions, and related retirement plans with personal accounts, and to identify the effects of changes in policies, market assumptions, or individual behavior, we used the Policy Simulation Group's (PSG) Pension Simulator (PENSIM) microsimulation models.⁴ PENSIM is a dynamic microsimulation model that produces life histories for a sample of individuals born in the same year.⁵ The life history for a sample individual includes different life events, such as birth, schooling events, marriage and divorce, childbirth, immigration and emigration, disability onset and recovery, and death. In addition, a simulated life history includes a complete employment record for each individual, including each job's starting date, job characteristics, pension coverage and plan characteristics, and ending date. The model has been developed by PSG since 1997 with funding and input by the Office of Policy and Research at the Employee Benefits Security Administration (EBSA) of the U.S. Department of Labor with the recommendations of the National Research Council panel on retirement income modeling.

PENSIM sets the timing for each life event by using data from various longitudinal data sets to estimate a waiting-time model (often called a hazard function model) using standard survival analysis methods. PENSIM incorporates many such estimated waiting-time models into a single dynamic simulation model. This model can be used to simulate a synthetic sample of complete life histories. PENSIM employs continuous-time, discrete-event simulation techniques, such that life events do not have to occur at discrete intervals, such as annually on a person's birthday. PENSIM also uses simulated data generated by another PSG simulation model, SSASIM, which produces simulated macro-demographic and macroeconomic variables.

PENSIM imputes pension characteristics using a model estimated with 1996 to 1998 establishment data from the BLS Employee Benefits Survey (now known as the National Compensation Survey). Pension offerings are calibrated to historical trends in pension offerings from 1975 to 2005, including plan mix, types of plans, and employer matching. Further,

⁴ For more information on PSG microsimulation models, see <http://www.polsim.com>. For more details on PENSIM, see Martin Holmer, Asa Janney, and Bob Cohen, *PENSIM Overview*, available from <http://www.polsim.com/overview.pdf>.

⁵ While these models use sample data, our report, like others using these models, does not address the issue of sampling errors. The results of the analysis reflect outcomes for individuals in the simulated populations and do not attempt to estimate outcomes for an actual population.

PENSIM incorporates data from the 1996-1998 Employee Benefits Survey (EBS) to impute access to and participation rates in DC plans in which the employer makes no contribution, which BLS does not report as pension plans in the NCS. The inclusion of these “zero-matching” plans enhances PENSIM’s ability to accurately reflect the universe of pension plans offered by employers. PENSIM assumes that 2005 pension offerings, included the imputed zero-matching plans, are projected forward in time.

PSG has conducted validation checks of PENSIM’s simulated life histories against both historical life history statistics and other projections. Different life history statistics have been validated against data from the Survey of Income and Program Participation (SIPP), the Current Population Survey (CPS), Modeling Income in the Near Term (MINT3), the Panel Study of Income Dynamics (PSID), and the Social Security Administration’s Trustees Report. PSG reports that PENSIM life histories have produced similar annual population, taxable earnings, and disability benefits for the years 2000 to 2080 as those produced by the Congressional Budget Office’s long-term social security model (CBOLT) and as shown in the Social Security Administration’s 2004 Trustees Report. According to PSG, PENSIM generates simulated DC plan participation rates and account balances that are similar to those observed in a variety of data sets. For example, measures of central tendency in the simulated distribution of DC account balances among employed individuals is similar to those produced by an analysis of the Employee Benefit Research Institute (EBRI)-Investment Company Institute (ICI) 401(k) database and of the 2004 SCF. GAO performed no independent validation checks of PENSIM’s life histories or pension characteristics.

In 2006, EBSA submitted PENSIM to a peer review by three economists. The economists’ overall reviews ranged from highly favorable to highly critical. While the economist who gave PENSIM a favorable review expressed a “high degree of confidence” in the model, the one who criticized it focused on PENSIM’s reduced form modeling. This means that the model is grounded in previously observed statistical relationships among individuals’ characteristics, circumstances, and behaviors, rather than on any underlying theory of the determinants of behaviors, such as the common economic theory that individuals make rational choices as their preferences dictate and thereby maximize their own welfare. The third reviewer raised questions about specific modeling assumptions and possible overlooked indirect effects.

Assumptions Used in Projecting DC Plan Balances at Retirement

PENSIM allows the user to alter one or more inputs to represent changes in government policy, market assumptions, or personal behavioral choices and analyze the subsequent impact on pension benefits. Starting with a 2 percent sample of a 1990 cohort, totaling 104,435 people at birth, our baseline simulation includes some of the following key assumptions and features. For our report, we focus exclusively on accumulated balances in DC plans and ignore any benefits an individual might receive from DB plans or from Social Security. Our reported benefits and replacement rates therefore capture just one source of potential income available to a retiree.

- Workers accumulate DC pension benefits from past jobs in one rollover account, which continue to receive investment returns, along with any benefits from a current job. At retirement, these are combined into one account. Because we focus on DC plan balances only, we assume all workers are ineligible to participate in DB plans and do not track Social Security benefits.
- Plan participants invest all assets in their account in life cycle funds, which adjust the mix of assets between stocks and government bonds as the individual ages. Stocks return an annual nonstochastic real rate of return of 6.4 percent and government bonds have a real return of 2.9 percent per year. In one simulation, we use the government bond rate on all plan assets.⁶ Using different rates of return reflect assumptions used by OCACT in some of its analyses of trust fund investment.
- Workers purchase a single, nominal life annuity, typically at retirement, which occurs between the ages of 62 and 70. Anyone who becomes permanently disabled at age 45 or older also purchases an immediate annuity at their disability age.⁷ We eliminate from the sample cohort members who: 1) die before they retire, at whatever age; 2) die prior to age 55; 3) immigrates into the cohort at an age older than 25; or 4)

⁶ The difference between the return on equities and Treasury bonds represents the compensation that individuals require for the higher risk of holding equities. Since our projections do not stochastically model stock returns, assuming a rate of return on assets equal to the historical return on stocks does not capture the risks associated with stock returns; we therefore also model DC savings under a scenario in which all assets return the government bond rate of return. For more discussion of the appropriate rate to use in projections, see "Analysis of H.R. 3304, Growing Real Ownership for Workers Act of 2005," Congressional Budget Office, Sept. 13, 2005, pp. 63-5.

⁷ We classify as retired those workers who become disabled after age 62. We do not classify as disabled those workers who recover from a disability prior to age 62.

becomes permanently disabled prior to age 45.⁸ We assume that the annuity provider charges an administrative load on the annuity such that in all scenarios the provider's revenues balance the annuity costs (i.e., zero profit).

- Replacement rates equal the annuity value of DC plan balances divided by a “steady earnings” index. This index reflects career earnings, calibrated to the Social Security Administration’s age-65 average wage index (AWI). PENSIM computes steady earnings by first computing the present value of lifetime wages. Then, it calculates a scaling factor that, when multiplied by the present value of lifetime earnings for a 1990 cohort member earning the AWI from ages 21 to 65, produces the individual’s present value of lifetime earnings. This scaling factor is multiplied by AWI at age 65, then adjusted to 2007 dollars. Using this measure as opposed to average pay for an individual’s final 3 or 5 years of working, minimizes the problems presented by a worker who has irregular earnings near the end of his or her career, perhaps because of reduced hours.⁹
- For household replacement rates, we use a combined annuity value of worker-spouse lifetime DC plan savings and a combined measure of steady family earnings.

Starting from this baseline model, we vary key inputs and assumptions to see how these variations affect pension benefits and replacement rates at retirement. Scenarios we ran include:

- (1) **Universal rollover of DC plan balances.** All workers with a DC balance roll it over into an Individual Retirement Account or another qualified plan upon job separation, as opposed to cashing out the balance, in which case the money is assumed lost for retirement purposes.
- (2) **Immediate eligibility and participation in a plan.** A worker who would be offered a plan has no eligibility waiting period and immediately enrolls. This does not necessarily mean that the

⁸ We drop cohort members who die before retiring because we assume annuitization at retirement, but someone who dies before retiring would never annuitize his DC savings. We apply the other conditions because such cohort members are likely to have fewer years in the workforce to accumulate DC plan savings.

⁹ The income quartile sub-samples used in this report are based on “steady earnings.”

participant makes immediate or regular contributions; contribution levels are determined stochastically by PENSIM based on worker characteristics.

- (3) **Delayed retirement.** Workers work beyond the retirement age determined by PENSIM in the baseline run. In one scenario, workers work up to one extra year; in another, they delay retirement for up to 3 years, although 70 remains the maximum retirement age.
- (4) **Raised contribution limits.** We set annual contribution limits starting in 2007 to \$25,000 per individual, up from \$15,500 under current law, and \$60,000 for combined employer-employee contributions, up from \$45,000 under current law. These limits rise with cost of living changes in subsequent years, as is the case in our baseline model.

PENSIM Cohort Summary and Cross-Sectional Statistics

Lifetime summary statistics of the simulated 1990 cohort's workforce and demographic variables give some insight into the model's projected DC savings at retirement that we report (see tables 8 and 9). The 78,045 people in the sample who have some earnings, do not immigrate into the cohort after age 25, live to age 55, and retire (or become disabled at age 45 or older), work a median 29.4 years full-time and 2.1 part-time, with median "steady" earnings of \$46,122 (in 2007 dollars).¹⁰ Those whose earnings fall in the lowest quartile work full-time for only a median 14.1 years, while working part-time for 9.1 years, and 13.4 years for their longest-tenured job; this group's median annual steady earnings measure \$16,820. In contrast, those in the highest-quartile of earnings work for a median 34.8 years, including 19.5 years for their longest job, and have median steady earnings of \$126,380 per year. The results also show that pension coverage varies somewhat across income groups. About 83 percent of workers in the lowest income quartile have at least one job in which they are covered by a DC plan throughout their working careers, and are eligible for DC plan coverage for a median 9.4 years. In contrast, at least 90 percent of workers in the highest three income quartiles have some DC coverage during their careers. Those in the highest income quartile are eligible for DC participation for a median 25.2 years throughout their career.

¹⁰ See discussion of definition of "steady" earnings above.

Table 8: Summary Statistics, PENSIM 1990 Cohort

Demographic variables, full sample	Full sample	By income quartile			
		1	2	3	4
N, full sample	104,435				
N, for replacement rate calculations ^a	78,045	19,511	19,511	19,512	19,511
Percent female	49.5	73.8	55.6	44.8	28.2
Education (median)	Some college	High school graduate	High school graduate	Some college	College graduate
Percent who work for at least one DC sponsor during career	90.4	83.2	90.8	92.7	95.1
Percent whose longest-held job offered DC pension	73.3	56.3	71.7	79.2	86.2

Source: GAO calculations of PENSIM simulation of 1990 cohort.

Note: Percentage female and education medians are for entire sample; all other statistics are for only those used in the replacement rate calculations.

^aExcludes cohort members who have no lifetime earnings; immigrate after age 25; die prior to retiring or becoming disabled; or become disabled prior to age 45.

Table 9: Sample Summary Statistics, PENSIM 1990 Cohort, Medians

Workforce variables	Full sample	By income quartile			
		1	2	3	4
Years working full-time	29.4	14.1	27.9	31.8	34.8
Years working part-time	2.1	9.1	2.2	1.1	0.5
Steady earnings (annual, 2007 dollars)	46,122	16,820	34,950	60,777	126,380
Number of jobs over lifetime	5.0	5.0	5.0	5.0	5.0
Duration of longest job, years	17.2	13.4	16.9	18.3	19.5
Retirement age	63.0	62.0	63.0	63.0	64.0
Years eligible for DC pension	18.5	9.4	17.6	21.2	25.2

Source: GAO calculations of PENSIM simulation of 1990 cohort.

Cross-sectional results of the sample cohort also provide some insights into the model’s assumptions, as well as some further insights into the relatively low projected sample replacement rates (see table 10). These statistics describe the working characteristics for each employed individual at a randomly determined age sometime between 22 and 62 in order to provide a snapshot of a “current” job for most of the sample.

Among those employed at the time of the survey, 61.8 percent had an employer who sponsors a DC plan. Of these workers with a plan offered, 94 percent were eligible to participate, and among those eligible 67 percent participated. Taking all of these percentages together, this means that at any one time only 38.9 percent of the working population actively participated in a DC plan in our projections. Even among these participants, only 56.9 percent reported making a contribution to the plan in the previous year, while 45.7 percent had an employer contribution. Median combined employer-employee contributions in the previous year were 6.2 percent of earnings in our simulation.

Table 10: Cross-Sectional Pension Characteristics of Sample

	Average	Median
Age at survey	42.1	42.1
Percent of sample employed	71.5	
Current job duration (years)	8.0	5.9
Job offers DC plan	61.8	
Among offered, percent eligible to participate	93.9	
Among eligible, percent participating	67.0	
Past year's employee contribution (percent of earnings)	4.3	3.9
Past year's employer contribution (percent of earnings)	3.1	0
Total contribution (percent of earnings)	7.4	6.2
Cumulative returns per year in plan (2007 dollars)	1,303	383
Cumulative returns in current plan (2007 dollars)	22,318	180
Among eligible, percent contributing in past year	56.9	
Among eligible, percent with employer contribution in past year	45.7	

Source: GAO calculations of PENSIM simulation of 1990 cohort.

Note: Results reflect one time snapshot of each member of the sample at a randomly determined age between 22 and 62.

Appendix II: Comparison of DC Plan Projections Based on PENSIM to Other Studies

Other studies have projected DC plan savings for workers saving over their entire working careers. These studies generally find higher projected replacement rates from DC plan savings than our simulations do. However, each study makes different key assumptions, particularly about plan coverage, participation, and contributions.

A 2007 study by Patrick Purcell and Debra B. Whitman for the Congressional Research Service (CRS) simulates DC plan replacement rates based on earnings, contributions, and the rate of return on plan balances.¹ CRS projects savings for households that begin saving at age 25, 35, or 45. The study estimates 2004 earnings using the March 2005 CPS as starting wages, and assumes that households experience an annual wage growth rate of 1.1 percent. Households are randomly assigned a 6 percent, 8 percent, or 10 percent retirement plan contribution rate every year from their starting age until age 65. The study assumes households allocate 65 percent of their retirement account assets to Standard & Poor's 500 index of stocks from ages 25 to 34, 60 percent to stocks from ages 35 to 44, 55 percent to stocks from ages 45 to 54, and 50 percent to stocks from age 55 and above, with the remaining portfolio assets invested in AAA-rated corporate bonds. A Monte Carlo simulation based on historical returns on stocks and bonds determines annual rates of return. Replacement rates represent annuitized DC plan balances at age 65 divided by final 5-year average pay.

After running the simulations, CRS finds variation in replacement rates depending on rate of return, years of saving, and earning percentile. In the CRS "middle estimate," the unmarried householder that saves for 30 years, has annual household earnings in the 50th percentile, contributes 8 percent each year until retirement, and earns returns on contributions in the 50th percentile would have a 50 percent replacement rate (see table 11). The projected replacement rate jumps to 98 percent at 40 years of saving, and 22 percent at just 20 years of saving. Assuming a 6 percent annual contribution reduces projected replacement rates by about 10 to 30 percent. For example, an unmarried householder at the 50th percentile of annual earnings and the 50th percentile of returns saving for 40 years is projected to have a replacement rate of 72 percent at a 6 percent annual contribution (see table 12). All CRS estimates, however, exceed those we report in projections in this report, in part because CRS assumes constant

¹ Patrick Purcell and Debra B. Whitman. "Retirement Savings: How Much Will Workers Have When They Retire?" Congressional Research Service, January 29, 2007.

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participation in, and contributions to, a DC plan. In addition, CRS calculated annuity equivalents of accumulated DC balances based on current annuity prices; for younger workers retiring several decades into the future, we would expect the price of a given level of annuity income to be higher than today's levels because of longer life expectancies. This would lower the replacement rates for any projected lump sum.

Table 11: Retirement Savings and Income Replacement Rates for Unmarried Householders, Annual Total Contributions Equal to 8 Percent of Household Earnings and 50th Percentile of Returns (2004 Dollars)

	Age household begins saving	Annual household earnings percentile		
		75 th	50 th	25 th
Baseline replacement rates (percent)	25	.91	.98	1.05
	35	.47	.50	.53
	45	.21	.22	.24

Source: Patrick Purcell, and Debra B. Whitman. "Retirement Savings: How Much Will Workers Have When They Retire?" Congressional Research Service, January 29, 2007.

Note: Replacement rates represent annuitized DC plan balances at age 65 divided by final 5-year average pay.

Table 12: Retirement Savings and Income Replacement Rates for Unmarried Householders, Annual Total Contributions Equal to 6 Percent of Household Earnings and 50th Percentile of Returns (2004 dollars)

	Age household begins saving	Annual household earnings percentile		
		75 th	50 th	25 th
Baseline replacement rates (percent)	25	.67	.72	.77
	35	.35	.37	.40
	45	.16	.17	.18

Source: Purcell and Whitman, 2007.

Note: Replacement rates represent annuitized DC plan balances at age 65 divided by final 5-year average pay.

A 2005 study, by Sarah Holden of ICI and Jack VanDerhei of EBRI, simulates, as a baseline scenario, retirement savings at age 65 for a group in their 20s and 30s in the year 2000.² The baseline assumes workers are

² Sarah Holden and Jack VanDerhei. "The Influence of Automatic Enrollment, Catch-Up, and IRA Contributions on 401(k) Accumulations at Retirement." *Investment Company Institute Perspective*, vol. 11, No. 2. (Washington, D.C.: Jul. 2005); co-published as EBRI *Issue Brief* No. 283 (Washington, D.C.: Jul. 2005).

continuously covered by a DC plan throughout their career, and that workers will continuously participate. However, the authors also run the model assuming this group will have participation rates similar to current rates by allowing workers to not be covered by, participate in, or contribute to a DC plan.³ Their model also incorporates the possibility that a participant might cash out a DC plan balance upon leaving a job. Replacement rates are calculated by earnings quartile for participants retiring between 2035 and 2039 as the annuity value of age-65 plan balances divided by final 5-year average pay.

The EBRI/ICI baseline projections, starting with a sample of plan participants, show a median replacement rate of 51 percent for the lowest earnings quartile and 67 percent for the highest. (See table 13). The authors analyze the effect of other plan or behavioral assumptions. For example, replacement rates fall significantly when the projections relax the assumption of continuous ongoing eligibility for a 401(k) plan, although they remain higher than our projections, perhaps because the projections start with current participants and assume continuous employment. When the authors include nonparticipants and assume automatic enrollment with a 6 percent employee contribution and investment of assets in a life cycle fund, replacement rates rise significantly from projections without automatic enrollment. Although they project a larger effect on replacement rates resulting from automatic enrollment than our projections show, EBRI/ICI similarly shows a greater increase in savings for lower-income workers.

³ Because the EBRI/ICI database does not include information for nonparticipants, the authors generate nonparticipants using their model.

Appendix II: Comparison of DC Plan Projections Based on PENSIM to Other Studies

Table 13: Median Replacement Rates from DC Plan Balances for Workers Turning 65 between 2030 and 2039, by Income Quartile

Replacement rates				
Income quartile	Baseline, assuming continuous eligibility, participants only	Without continuous eligibility	With continuous eligibility, including non-participants	With continuous eligibility and automatic enrollment, including nonparticipants
1 st	.51	.23	.23	.52
2 nd	.54	.23	.33	.54
3 rd	.59	.25	.43	.57
4 th	.67	.28	.56	.63

Source: Sarah Holden and Jack VanDerhei. "The Influence of Automatic Enrollment, Catch-Up, and IRA Contributions on 401(k) Accumulations at Retirement." *Investment Company Institute Perspective*, vol. 11, No. 2, July 2005); co-published as EBRI *Issue Brief* No. 283 (Washington, D.C.: Jul. 2005).

Note: Replacement rates equal income generated from DC savings divided by final 5-year average salary.

A forthcoming study by Poterba, Venti, and Wise uses the Survey of Income and Program Participation (SIPP) to project DC plan balances at age 65.⁴ In order to project participation, the authors assume that DC plan sponsorship will continue to grow, although more slowly than during recent decades.⁵ They calculate participation by earnings deciles within 5-year age intervals. The authors assume that 60 percent of plan contributions are allocated to large capitalization equities, and 40 percent to corporate bonds, and assume an average nominal rate of return of 12 percent for equities and 6 percent for corporate bonds. In addition, the authors run a projection assuming the rate of return on equities is 300 basis points less than the historical rate. They determine a person's likelihood of DC plan participation based on age, cohort, and earnings, as well as the probability of cashing out an existing DC plan balance when someone leaves a job. The authors simulate earnings histories based on data from the Health and Retirement Study (HRS), and impute earnings for

⁴ James Poterba, Steven F. Venti and David A. Wise. "New Estimates of the Path of 401(k) Assets," forthcoming in J. Poterba, ed., *Tax Policy and the Economy*, vol. 22 (Chicago: University of Chicago Press, 2008).

⁵ We ran a simulation in PENSIM assuming that all future pension plans are DC plans. Under this extreme scenario, we find average projected replacement rates from DC plan savings of 24.2 percent for a 1990 cohort. Lowest-income quartile replacement rates measured 11.5 percent, while highest-quartile replacement rates were 36.4 percent.

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younger cohorts for which data are not available. They assume an annual combined employee-employer contribution rate of 10 percent for each year an individual participates, and do not account for increases in annual contributions or changes made to DC plans in the Pension Protection Act, such as a possible increase in participation by automatically enrolling employees.

The authors find retirement savings for individuals retiring by decade between 2000 and 2040 by lifetime earning deciles. For workers in the fifth earnings decile retiring in 2030 at age 65, the authors project a mean DC plan balance of \$272,135 in 2000 dollars, and \$895,179 for the highest earning decile (see table 14). Earners in the lowest and second deciles, however, project average balances of \$1,372, and \$21,917. The projected average DC plan assets for 2030 retirees fall to \$179,540 for the fifth decile of earnings, \$614,789 for the highest decile, and \$810 for the lowest decile when the authors assume an annual rate of return 300 basis points below the historic rate of return (see table 15).

Table 14: Mean Projected DC Plan Assets for Cohorts Retiring in 2000, 2010, 2020, 2030, and 2040, by Lifetime Earnings Deciles (in 2000 dollars)

Baseline retirement savings (\$)			
Cohort	Lifetime earning decile		
	1 st	5 th	10 th
2000	0	19,437	166,405
2010	158	28,367	343,137
2020	366	166,268	577,632
2030	1,372	272,135	895,179
2040	3,688	489,558	1,242,580

Source: James Poterba, Steven F. Venti and David A. Wise. "New Estimates of the Path of 401(k) Assets," forthcoming in J. Poterba, ed., Tax Policy and the Economy, vol. 22 (Chicago: University of Chicago Press, 2008).

Appendix II: Comparison of DC Plan Projections Based on PENSIM to Other Studies

Table 15: Mean Projected DC Plan Assets for Cohorts Retiring in 2000, 2010, 2020, 2030, and 2040, Assuming Rate of Return on Equities is 300 Basis Points Less than Historic Rate, by Lifetime Earnings Deciles (in 2000 dollars)

Retirement savings (2000 dollars)			
Cohort	Lifetime earning decile		
	1 st	5 th	10 th
2000	0	19,437	166,405
2010	147	75,555	315,294
2020	335	128,920	454,171
2030	810	179,540	614,789
2040	2,072	292,902	785,150

Source: Poterba, Venti, and Wise, forthcoming 2008.

Finally, a 2007 study by William Even and David Macpherson estimates replacement rate for those continuously enrolled in a DC plan between 36 and 65 years of age.⁶ The authors simulate a sample using the SCF, and generate an age earnings profile for their sample using data on pension-covered workers in the 1989 SCF. The authors also use the SCF to generate annual contributions to DC plans, which are estimated using a person’s earnings, age, education, gender, race, ethnicity, marital status, union coverage, and firm size. The authors also create an artificial sample for workers who are predicted to be eligible for a DC plan, but choose not to participate. Finally, the authors assume three different rates of return on pension contributions: a 3 percent rate of return based on historical returns on government bonds; a historic returns portfolio based on an account mix of 75 percent in stocks split between large and small capital equities, and 25 percent split between long term corporate bonds, long-term government bonds, midterm government bonds, and Treasury bills; a 6.5 percent real rate of returns based on the average real rate of return on DC plans from 1985 to 1994 for plans with over 100 participants. In calculating annuity rates, the authors rely on mortality tables for group annuitants as opposed to the population as a whole, and do not include the charge the company makes for marketing and administrative expenses.

⁶ William Even and David Macpherson. “Defined Contribution Plans and the Distribution of Pension Wealth.” *Industrial Relations*, vol. 46, Number 3. July, 2007.

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The authors find that replacement rates vary by income distribution.⁷ For example, low-income workers who are continuously enrolled in a DC plan at the median replacement rate distribution are estimated to have a 30 percent replacement rate. (see table 16) The average replacement rate for such workers is 44 percent. Middle-income and high-income workers have median replacement rates 31 percent and 35 percent respectively. The authors' estimates are likely higher than ours because the authors assume continuous enrollment.

Table 16: Replacement Rates by Income

Income	Replacement rate
Low	.30
Middle	.31
High	.35

Source: William Even and David Macpherson. "Defined Contribution Plans and the Distribution of Pension Wealth." *Industrial Relations*, Vol. 46, Number 3. July, 2007

⁷ The authors define a low group to have simulated earnings at age 65 of approximately \$48,000 or less; the top third has income of approximately \$70,000 or more.

Appendix III: GAO Contact and Staff Acknowledgments

Contact

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Staff Acknowledgments

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