

Promoting Work at Older Ages: The Role of Hybrid Pension Plans in an Aging Population

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Abstract

Employers are beginning to search for ways to elicit more labor supply from older adults as the population ages, the ability to work in later life increases, and younger workers become relatively scarce. Many employers are turning to hybrid pension plans, such as cash balance plans and pension equity plans. Whereas traditional defined benefit plans often subsidize workers who retire early and penalize those who remain at work beyond the plan's retirement age, most hybrid plans reward work at older ages. This paper documents the impact of population aging on the labor market and changes over time in work capacity at older ages. It then shows how movement toward hybrid pension plans, among other types of private and public retirement plan reforms and redesigns, can be used to increase work incentives for older adults.

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Introduction

The world of retirement plans has changed dramatically since the early 1970s. Defined contribution (DC) plans have now supplanted the defined benefit (DB) format as the most common type of retirement plan, in terms of number of participants and value of assets, while hybrid pension plans, including cash balance and pension equity plans, have transformed the DB universe. Although these changes partly represent reactions to tax laws and new conventions among employers perhaps looking to save money, broader economic forces are also clearly at play. Demographic shifts, reflected in the aging of the population, stand out.

During the 1970s and 1980s, when the nation's labor force was growing rapidly, many employers used their pension plans to encourage workers to retire early. Traditional DB plans typically provide lifetime annuities paid in monthly installments that depend on years of service and salary earned near the end of the career. The size of the monthly benefit increases with years of service, but plan participants lose a year of payments for each additional year of work beyond the age at which they can first collect benefits. Because the increase in benefits paid in each installment is often insufficient to offset the reduction in the number of installments, many workers in DB plans lose pension wealth by delaying retirement. DB plans also often include early retirement provisions, which further discourage work at older ages by subsidizing benefits for those who retire early, often as young as age 55.

Although many workers remain productive at older ages but retire with many years of life expectancy remaining, employers still used to argue that the retirement incentives in traditional DB plans enabled them to make room for the large numbers of young workers entering the labor

force each year without resorting to layoffs or wage cuts for older workers, which can destroy employee morale. In addition, seniority pay systems often ended up compensating some older workers more than they were worth in productive output, making the retirement incentives in DB plans even more appealing to employers.

Employers were able to let productive workers go because the influx of women and young baby boomers into the workforce created an ample supply of labor. Today, however, as the relative size of the younger population falls, employers confront potential worker shortages and are reluctant to lose their skilled workers to retirement. Meanwhile, pension costs for traditional DB plans have risen over the past few decades, after adjusting for stock market gyrations, because retirees are now living and collecting benefits longer than they did in the past.

The growing popularity of hybrid pension plans represents one response to the changing demographics of the labor market. As in DC plans, which are typically tax-deferred retirement accounts into which both employers and employees contribute, hybrid plans express future retirement benefits as account balances. In cash balance plans, employers set aside a percentage of each employee's salary each period, which earns interest at a set rate. Balances in pension equity plans equal a given percentage of final average earnings for each year of service. Because these account balances continue to grow at about the same rate after the retirement age as they did beforehand, DC and hybrid plans generally do not discourage workers from remaining on the job at older ages. By shifting from traditional plans to hybrid plans (or never adopting DB plans, which is standard practice for new firms), employers may be better able to retain their older workers and hire new workers of any age.

These shifts are not without controversy. Employers may change plans to reduce pension costs, especially when they drop early retirement incentives. Whether this saving accrues

primarily to workers or owners of the company depends greatly upon whether the shift raises compensation costs or profits, and whether workers are able to demand that their total compensation, regardless of pension plan design, reflects their overall productivity. Even if pension costs do not fall, some workers will lose out when changes in pension format spread benefits more evenly among all age groups. In many traditional DB plans, 50-year-olds receive large increases in lifetime pension benefits in return for an additional year of work, but 65-year-olds receive next to nothing. Converting to a different format, such as a cash balance plan, that increases pension wealth by a moderate amount for both groups could generate opposition from those planning to retire early.

This private transformation of retirement policy may indirectly support national retirement policy objectives. With the aging of the population, there is increasing concern about the ability of workers to pay enough taxes to support future retirees and other government functions. Moreover, the vast majority of today's retirees depend more on Social Security and Medicare than their own saving (Gustman et al., 1999), yet they spend close to one-third of their adult lives in retirement. By instead working and saving for a few more years, they can do much to reduce this level of dependency.

More importantly, if current employment patterns persist, fewer workers producing fewer goods and services can threaten standards of living for Americans of all ages—or at least the rate at which those standards rise. By promoting work at older ages, conversion to hybrid pension plans and other initiatives may increase the labor pool and relieve some of the demographic pressures on public programs caused by population aging. Put another way, people who work an extra year produce goods and services that can support their own current consumption and help

cover the costs of both retirement programs and other government efforts (such as defense) while at the same time reducing tax pressures on younger workers to support them in retirement.

This paper examines the growth in hybrid pension plans within the context of the changing labor market. The next section documents how population aging is transforming the labor market and how the labor force will likely change in the near future if current participation rates persist. The paper then considers how improvements over time in health status and declines in the physical demands of work increase work capacity at older ages. Section IV examines how retirement incentives differ between hybrid plans and traditional DB plans, and section V offers conclusions.

The Changing Demographics of the Labor Market

People are now living longer and having fewer children. Between 1950 and 2001, the U.S. fertility rate (defined as the ratio of births to women aged 15 to 44) declined from 106 to 65 (Hamilton, Martin, and Sutton, 2003; U.S. National Center for Health Statistics, 1999), while life expectancy at birth increased from 68 years to 77 years (Arias and Smith, 2003; U.S. National Center for Health Statistics, 2002). These trends have combined to increase the average age of the U.S. population. Between 1950 and 2000, the share of the adult population aged 65 and older increased from 12 percent to 17 percent (see Figure 1), and Census projections indicate that this share will grow even more rapidly over the next 50 years, rising to 27 percent in 2050. In addition, the oldest old population, which is most likely to need costly supportive services such as nursing home care, will soar in the coming decades, with the number of people ages 85 and older rising from 2 percent of the adult population in 2000 to 6 percent in 2050. Meanwhile, the total number of adults under the age of 55, who traditionally dominated the nation's workforce,

will remain virtually unchanged between now and 2020, even though the overall population will grow by 44 million, according to Census projections (U.S. Census Bureau, 2002a, 2002b).

Figure 1 here

The aging of the baby boom, the generation born in the 20 years after the end of World War II, is accelerating long-term changes in the age distribution of the population that would have occurred even if this cohort were not so large. The surge of births in the 1950s and 1960s masked the long-term decline in fertility that began more than 100 years ago, delaying the relative rise in the elderly population by a couple of generations. As the baby boomers now approach retirement, however, they will force the economy to adjust to the presence of a large older population within about a single generation. Without the baby boom, this process might have taken three generations.

As the age distribution changes, the number of younger adults per older adult in the population will continue to plummet. Since 1950, for example, the ratio of adults between the ages of 18 and 64 to adults ages 65 and older fell from 7.5 to 5.0, and will decline further to 2.8 by 2050. If workers continue to retire at about the same age as they do now, in 50 years there will be only about half as many workers as there are today to pay the cost of Social Security, Medicare, and other benefits received by each older adult. Barring a surge in productivity, the relative growth in the size of the dependent population will mean fewer benefits for older adults, higher taxes for younger adults, or both.

Labor Force Participation Rates. But changes in population tell only part of the story. What really matters for total economic output, and the burden of supporting the older population, is the number of workers in the economy relative to those who will be supported, which in turn depends on individual decisions about work. Society could limit the burden of old age support

by gradually redefining old age according to life expectancy, implying that people in their 60s today and in the 21st century may indeed be middle-aged. According to data from Social Security's actuaries, 75-year-olds in 2050 can expect to survive another 12.6 years on average, about as long as 65-year-olds lived in 1940, when Social Security began. By delaying retirement and deferring old age benefits until later in life, Americans can offset the demographic pressures created by living longer and having fewer children.

Until recently, labor force participation rates for men have been declining steadily, particularly at older ages (see Figure 2). Almost three-quarters of men ages 55 to 74 worked in 1950, compared with just under half in 2000. Nonetheless, there are encouraging signs that the decline in participation rates has ended and may have even reversed. For example, between 1995 and 2003, employment rates among men ages 62 to 64 increased from 42 percent to 47 percent (Purcell, 2003). Employment rates among men ages 55 to 61 did not increase over the period, however.

Figure 2 here

Labor supply patterns are very different for women, of course, who entered the labor force in large numbers over the past 50 years. Labor force participation rates for women ages 25 to 54 more than doubled between 1950 and 2000, to 76 percent, and women are now almost as likely as men in this age group to work. The movement of women into the labor force has offset the decline in male participation and maintained the overall size of the labor pool. In fact, labor force participation rates among all adults increased in almost every non-recession year since 1950 (Steuerle and Carasso, 2001; U.S. Bureau of Labor Statistics, 2003a). But it is unlikely that participation rates among young and middle-aged women—which are already close to male participation rates—will rise much higher in coming years, especially given the childcare

responsibilities that many women face. Participation rates among older women will probably increase in the near term, however, as later generations of women who are accustomed to paid employment reach old age and replace earlier generations who worked less outside the home. For example, employment among women ages 55 to 61 rose from 54 percent in 1995 to 61 percent in 2003 (Purcell, 2003).

Projecting Future Participation Rates. Many economic and demographic forecasters use these data to predict future labor force participation rates by age and sex according to past patterns. Although the decline in labor supply at older ages appears to have stopped, the reversal so far is small enough that most projections assume that workers in the future will retire at about the same age as they do today. Some economists believe that even this assumption is too optimistic and that the long-term trend toward earlier retirement will continue indefinitely, because people tend to demand more leisure when their wealth rises (Costa, 1998). According to this view, as long as economic growth continues to raise per-capita income and people take leisure time in the form of retirement, employment at older ages will continue to fall.

The assumption that 2000 work patterns persist into the future implies that the share of adults in the labor force will drop over the next 50 years as the nation ages (see Figure 3). According to these projections, the labor force participation rate for women will begin to fall by 2010, and the rate in 2050 for all adults ages 20 and older will fall back to its 1950 level, down 8 percentage points from 2000.

Figure 3 here

These declines in labor force participation rates would reduce the 10-year growth rate in the size of the labor force to less than 4 percent between 2010 and 2020, down from 12 percent between 1990 and 2000. Figure 4 shows how declines in the growth rate of the labor force

reduce the number of workers per non-working adult ages 65 and older. Between 2000 and 2030, the ratio falls from 4.5 to 2.6, assuming 2000 work patterns persist into the future. And this analysis ignores the fact that most people begin collecting Social Security at age 62, not age 65.

Figure 4 here

An essentially stagnant labor pool would significantly strain both the economy and government budget. The decline in labor force growth would in turn reduce economic growth and increase the probability of a recession, all else equal, although slower labor force growth is certainly not enough by itself to eliminate all or even most economic progress. Productivity will rise and economic growth will continue as long as the nation continues to invest in physical capital and education and other types of human capital.

The federal budget, of course, is already on an unsustainable course. A balanced budget that maintains current tax policies and promises to the elderly, while reducing defense and international expenditures only moderately, would leave nothing – absolutely nothing – for any other government functions by 2011 (Steuerle, forthcoming). All other government services, ranging from children's programs to community development to energy to transportation to income assistance, would face elimination. The aging of the population would make the situation even worse after 2011.

We do not, however, expect this situation to continue. Paraphrasing Herbert Stein, "what can't continue, won't." One solution for government programs is to elicit more years of work from individuals, rather than subsidizing them to retire with so many years of life remaining. Policymakers could raise the retirement age for Social Security or lower the level of retirement benefits relative to past wages, as the recent President's Commission to Strengthen Social

Security (2001) recommended. In fact, although there is fierce disagreement on the size of the change, almost all proposals from conservatives, liberals, and any retirement commission put together in recent years would reduce at least somewhat the replacement rate in Social Security, thus encouraging work at older ages. Congress also recently eliminated the earnings test in Social Security, and reforms enacted back in 1983 have been gradually raising the “normal” retirement age in recent years. But if changes to public policy are to elicit more years of work, and if workers are going to seek more employment later in life to maintain higher replacement rates in retirement, private retirement systems are going to have to adjust to accommodate these additional workers.

Even if government does not respond further – an almost impossible assumption, given the projections – we do not believe that future labor force participation rates will be as low as the simple forecasts suggest. For one thing, it is misleading to measure leisure simply as time spent outside the labor market. Workers do not have to retire to enjoy leisure and a more relaxed lifestyle; they can remain employed but take more vacation time, engage in more stimulating work, or simply find better working conditions. Thus we do not believe the argument that higher standards of living inexorably lead to more years of retirement. Until very recently in human history, most people did not retire at all.

Another perhaps more important problem with many of today’s simple forecasts of labor supply is that they ignore the demand for labor. For example, they tend to treat the entry of women into the labor force as a sociological phenomenon arising from the development of more equal rights for women and technological improvements in home production. In fact, employment rates arise from the interaction of labor supply with labor demand, which derives from the public’s desire for goods and services. The movement of younger and then middle-

aged women into the labor force over the past 30 years allowed older workers to retire at relatively younger ages without slowing the growth of the labor force or upsetting the equilibrium of the labor market. If women and other groups (such as immigrants) are unable to fill the shortfall in labor created by early retirement, then workers will likely end up staying in the labor force for more years. The invisible hand of the market will raise compensation (wages and benefits) to draw just enough workers into the labor force to allow supply to meet demand. Because the demand for goods and services (and hence labor) is related to the size of the population, predicting future labor force participation as a share of the total population, instead of separately by age and sex, might generate more reliable forecasts of the future size of the workforce (Steuerle and Carasso, 2001). By the same token, much depends upon the speed of institutional reaction, especially public and private retirement policy.

Who will supply the labor necessary to meet the demand for goods and services over the next 50 years? Under the standard age-sex based labor supply projections that assume roughly that 2000 patterns persist into the future, *people over the age of 55 will make up more than two-thirds of adults outside the labor force by 2050*. And more than one-third, or 47 million, will be between the ages of 55 and 74 (see Figure 5). Like women in the past generation, older adults represent a huge source of potential labor in what is now the very near future.

Figure 5 here

The world of work will look very different if older adults resume working at levels that prevailed in the not too distant past. Figure 6, for instance, shows projected differences in 2020 in the number of workers per nonworking adult aged 65 and older, depending upon the labor force participation rates of men. If all men and women continue to work at the same rate as they did in 2000, then the ratio will drop from 4.5 in 2000 to 3.3 in 2020. However, if men ages 55

and older begin to participate at the rate they participated in 1960 (and everyone else continues to participate at their 2000 rates), then the ratio in 2020 will rise back to about 3.8 – not enough to solve the old age crisis, but enough to make the problem significantly more manageable.

Moreover, this calculation does not account for increases in longevity. It may be more appropriate to compare labor supply for a 65-year-old man in 2020 and a 60-year-old man in 1950, because both men would have about the same remaining years of life expectancy.

Figure 6 here

Changes in the Ability to Work at Older Ages

Admittedly, the recent trend toward more work at later ages is so new that we cannot prove that it will continue. But we can address the question of whether people are capable of work at ages at which most workers today have already retired, such as 62, 65, and 70. Do poor health and the physical demands of work really require them to spend the last third of their lives in retirement?

There is considerable evidence that adults between the ages of 55 and 75 are better able to work today than they were in the past, because health status has improved over time and the physical demands of work have declined. On the basis of life expectancy alone, for instance, it is unclear that these adults should even be called old. For instance, classifying people as old only if they have on average no more than 10 years of remaining life expectancy would place 75-year-olds in late middle age today; among those born in 1938 (who reach age 65 in 2003), old age would not begin until age 76 for men and age 80 for women (Social Security Administration, 2003a, 2003b).

Increases in life expectancy have been accompanied by improvements in health at middle age and beyond over at least the past 25 years (Crimmins, Reynolds, and Saito, 1999; Manton

and Gu, 2001), and perhaps much longer (Costa, 2002). Figure 7, for example, shows that the share of adults ages 55 to 64 and ages 65 to 74 describing themselves as being in poor or fair health (as opposed to good, very good, or excellent health) declined steadily from 1982 to 2001. Although self-reports of health status are not perfect, they do appear to contain a substantial amount of information, and are strong predictors of mortality (Idler and Benyamini, 1997). The decline in the share reporting fair or poor health has been especially pronounced at ages 65 to 74, falling over the period from 34 percent of the population to 23 percent. And many older adults in fair health are able to work.

Figure 7 here

Declines in Physical Job Demands. The decline of the manufacturing sector over the past half century and the growing computerization of the workforce also appear to have reduced the physical demands of work. Here are several pieces of related evidence.

First, between 1950 and 2000, the share of jobs in the goods-producing sector (which includes the construction and mining industries as well as manufacturing) fell from 41 percent to 20 percent, and virtually all of the employment growth in the economy between 2000 and 2010 is expected to come from the services-producing sector (Berman, 2001; Plunkert, 1990). Most manufacturing jobs require more physical strength and endurance than the office work or retail sales that tends to characterize the services sector.

Second, the share of older workers in jobs that almost never require much physical effort increased significantly in just a 10-year period. The Health and Retirement Study (HRS), an ongoing government-funded survey of older Americans, asks respondents how often their jobs require lots of physical effort. It also asks them how often they have to lift heavy loads and stoop, kneel, or crouch at work. As shown in Figure 8, the share of workers ages 55 to 59

reporting that their jobs never or almost never involve these types of activities increased significantly between 1992 and 2002, and the percentages can be expected to increase in the future.

Figure 8 here

Third, research based on a more objective measure of job requirements found sharp declines in physical demands throughout the second half of the last century. The Dictionary of Occupational Titles (DOT) classifies and rates thousands of occupations on the basis of the type of work performed and its complexity. Based on extensive on-site studies and information collected from trade and professional organizations, trained job analysts measured the level of strength required for each of more than 12,000 occupations. By matching these occupations to workers in the Current Population Survey, researchers were able to measure changes over time in the share of workers in physically demanding jobs, based on the amount of heavy lifting that the jobs require. By this measure, the share of workers in physically demanding jobs dropped from 20 percent in 1950 to 7 percent in 1996 (see Figure 9).

Figure 9 here

Fourth, this combination of improvements in health and declines in the share of jobs in the economy that require substantial amounts of physical effort has reduced the share of older adults who claim they are unable to work. Comparing data from the National Longitudinal Survey of Older Men and the Health and Retirement Study, we found that the share of men ages 55 to 59 reporting health problems that limit the type or amount they can do fell over time, from 27 percent in 1971 to 23 percent in 1992 to 20 percent in 2002 (see Figure 10).

Finally, perhaps the most compelling piece of evidence on the ability to work at older ages comes from examining how much people were able to work in the past, when health status

was generally worse and jobs more physically demanding. The relatively high employment rates among older men in the past implies that many people retire early today not because they are physically unable to work, but because they prefer to work less, their employers encourage them to retire, or the increasing generosity of government programs induces them to drop out of the labor force.

Figure 10 here

Figure 11 shows labor force participation rates from 1940 to 2001 for 65-year-old men and for men with about 16 years of remaining life expectancy (the life expectancy for 65-year-old men in 2001). In 1940, about two-thirds of 65-year-old men participated in the labor force, compared with 38 percent in 2001. Measured by life expectancy, the drop was even greater. Between 1940 and 2001, for men with about 16 years of life expectancy, the participation rate fell from 86 percent to 38 percent. Given improvements in health and reductions in the physical demands of work, these data provide compelling (although not definitive) evidence that the trend toward more and more years of retirement arises from such factors as the incentives embedded in public and private retirement programs, not from the inability of older adults to work.

Figure 11 here

Incentives Created by Employer-Sponsored Pension Plans

What do the aging of the population and changes in the ability to work at older ages mean for employers? Whether prodded by government policy or market demand for goods and services, Americans in late middle age, or perhaps early old age, will likely be meeting some of the future demand for workers, even though at one time their chronological age (rather than life expectancy) might have led society to define them as too “old” to work. We have seen that people ages 55 to 74 could soon represent the largest pool of non-employed or underemployed

labor in the economy, even while most report being in fairly good health and jobs are less physically demanding than ever. Employers, therefore, have incentives to provide compensation packages that attract older workers. Pension and retirement benefits are key pieces of compensation that can play critical roles in encouraging workers to remain on the job.

Traditional DB plans were once the dominant type of employer-sponsored pension plan. In 1980, for example, 63 percent of active participants in private plans belonged to DB plans, which accounted for 71 percent of all pension assets (U.S. Pension and Welfare Benefits Administration, 2001-2002). However, growth in DB plans has stagnated over the past 20 years, while participation in 401(k) plans has soared. As a result, in 1998 only 31 percent of active pension plan participants in the private sector belonged to DB plans, which accounted for fewer than half of all pension assets (although DB plans still dominate among large unionized employers and in the public sector). In addition, a growing number of DB plans are now cash balance plans and pension equity plans, hybrids that combine features of traditional DB plans and DC plans (but are still considered to be DB plans for legal and regulatory purposes).

The erosion of traditional DB coverage concerns some pension advocates, who fear that that it threatens retirement security. Whereas DB plans guarantee fixed retirement benefits insured partly by the federal government, balances in DC accounts depend on uncertain market returns and the discipline of workers to set part of their paychecks aside each month for retirement savings. To secure lucrative retirement benefits, DC participants must also make wise investment decisions, rollover their balances into other retirement savings accounts when they leave their employers before retirement, and carefully manage their balances after they retire, because few DC participants convert their balances into life annuities (Burman, Johnson, and Kobes, 2003).

The growing number of firms converting their traditional DB plans to hybrid plans has also generated controversy. Hybrid plans are viewed by some as attempts by employers to renege on past DB pension promises in order to cut costs, and a federal court has ruled that IBM's cash balance plan discriminates against older workers, who have fewer years of accumulation for a given effective deposit than younger workers (*Cooper v. IBM Personal Pension Plan*, No. 99-829-GPM (S.D. Ill. 2003)).

But in many ways, DC and hybrid plans respond to the labor market conditions of the new century. Unlike DB plans, they do not penalize workers who separate from their employers before reaching retirement age, and thus appeal to an increasingly mobile workforce (Farber 1999). And they do not penalize workers who remain with the employer past the plan's retirement age, and thus lack the early retirement incentives inherent in many DB plans. Nor do they necessarily penalize workers who join new firms after age 65.

Measuring Retirement Incentives. Pension accruals, the increase in pension wealth that results from an additional year of work, are common measures of the retirement incentives embedded in pension plans. Pension wealth in traditional DB plans can be measured as the present discounted value of the stream of expected benefits. In DC plans and hybrid plans, pension wealth simply equals the account balance. Large positive rates of accrual create strong disincentives to retire, because pension wealth will grow substantially if workers remain on the job; small positive accrual rates and negative accrual rates create incentives to retire before pension wealth erodes.

Traditional DB plans typically pay participants lifetime annuities that depend on years of service. Some plans (usually multi-employer plans run by unions) pay benefits equal to a fixed amount per year of service. Most DB plans, however, set benefits equal to a given percentage of earnings times the number of years of service. Sometimes the earnings base is defined as

average pay received throughout the career; more commonly it is a measure of earnings received near the end of the career, such as average pay over the three highest-pay years with the employer. Workers can start collecting benefits after they have separated from the employer and reached the plan's retirement age. If they leave beforehand, they typically have to wait until they reach retirement age to collect benefits, which are based on the nominal earnings received when they left the employer.

Pension wealth tends to grow slowly in traditional DB plans for relatively young workers, increases rapidly once workers approach retirement age (or maximum years of countable service), and often declines if they remain with the employer beyond that age or time. Pension accruals and wealth are also low at young ages because retirement benefits are discounted many years into the future for younger workers. However, pension accruals in most traditional DB plans rise rapidly as workers age, because an additional year on the job increases pension benefits not only by adding an additional percentage of pay, but also by raising the value of all previous benefit accruals by a combination of real income growth and inflation. This additional increment is often substantial for workers with lengthy job tenures. Pension wealth also increases as workers approach retirement age and benefits are no longer discounted far into the future.

Workers in traditional DB plans can lose pension wealth, however, if they stay on the job beyond a certain age or seniority level. Growth in promised annual retirement benefits slows at older ages as wage growth declines. Some plans also cap the number of years of service that workers can credit toward their pensions, and others cap the share of pre-retirement earnings that the plan will replace in retirement. In addition, for every year that workers remain on the job past the plan's retirement age, they forego a year of retirement benefits. Accruals turn negative

when the increase in annual benefits from an additional year of work is insufficient to offset the reduction in the number of pension installments.

Many traditional DB plans include early retirement incentives. These provisions allow workers to collect reduced benefits before they qualify for full benefits at later ages. Annual benefits received through these plan provisions are lower than those received at the normal retirement age because they are paid earlier (so that one dollar in early retirement benefits has a higher present value than one dollar in normal retirement benefits) and because early retirees receive more pension installments than those who retire later. However, in many plans the reduction in benefits for early retirement is insufficient to offset fully the additional pension installments and the diminished effects of discounting. As a result, many workers in traditional DB plans can maximize pension wealth by retiring at relatively young ages. These provisions may have made sense to employers a few decades ago when the labor pool included many relatively inexpensive younger workers who could replace their more expensive senior counterparts, but not today when younger workers are in short supply.

The retirement incentives created by DC plans and hybrid plans generally differ markedly from those created by traditional DB plans. In DC plans, the increment to pension wealth associated with an additional year of work equals employer contributions to the DC account. (Pension accruals exclude investment income, which can continue to accrue after the worker separates from the employer.) Most firms offering DC plans contribute a fixed percentage of the worker's salary to the plan account; only 4 percent of full-time workers in private-sector DC plans belong to plans that explicit vary employer contribution rates by years of service (U.S. Bureau of Labor Statistics 2003b). However, many employers match a portion of the worker's contributions, which tend to increase with age. Thus, pension accruals in some DC plans

increase with age, but not as dramatically as in traditional DB plans. And although poor investment returns can shrink the value of DC accounts, accruals in DC plans associated with an additional year of work are never negative.

Pension accruals in hybrid plans are also much flatter than in traditional DB plans. In cash balance plans, the accrual equals the pay credit rate times salary (as long as the interest credit rate is approximately equal to the rate that workers could earn on their balances if they left the firm and invested the funds on their own). However, unlike traditional DB plans, past vested benefits typically increase over time with interest regardless of whether the employee stays on the job or not. Accrual profiles do tend to be somewhat steeper in plans that increase pay credit rates with years of service, which is fairly common (U.S. General Accounting Office, 2000). Nonetheless, these accrual profiles are smoother in cash balance plans than typical traditional DB plans. Cash balance plans do not exhibit the spikes in pension wealth that often characterize traditional DB plans, and accruals in cash balance plans are always greater than zero for vested workers, except for some workers who were already participating in the plan when it converted from the traditional DB format. In general, transition effects—including this issue of whether economic accumulation is or should be allowed initially after conversion until a so-called “wear-away” effect ends—is not addressed in this paper.

Wealth in pension equity plans grows over time as workers accumulate pay credits and salaries rise. As in cash balance plans, pay credit rates in these plans often increase with age or years of service (Allen et al., 2003). However, active plan participants do not earn interest on their accumulated balances. The opportunity cost of remaining with the employer, in terms of foregone investment earnings, increases over time as the balance grows. For plans in which the pay credit rate does not increase with tenure, accrual rates will fall over time (and could

eventually become negative) if the growth rate in salaries falls short of the interest rate that participants could earn on their balances after they separate from the employer.

Figure 12 compares pension accruals by age in traditional DB plans in the private sector and prototypical hybrid plans. The graph presents pension accruals as a percentage of the annual wage. All of the accruals shown in the figure are based on a common set of assumptions. The estimates assume that workers join the employer at age 25 and that wages grow at the average rate among college-educated men in DB plans, as reported in Toder et al. (2002). The annual growth rate in wages is about equal to 5 percent for workers in their late 20s, 3 percent for workers in their late 30s, and less than 2 percent for workers in their 50s. The analysis uses a real interest rate of 3 percent and an inflation rate of 4 percent.

Figure 12 here

Estimates for traditional DB plans are based on the Pension Insurance Modeling System (PIMS). PIMS is a simulation model developed by the Pension Benefit Guaranty Corporation, a federal corporation that insures DB plans. It includes information on about 600 single-employer plans in the private sector. Although the dataset include a wide range of plans currently in use, it does not contain any multiemployer plans and very few plans from small employers. As a result, these plans are somewhat more generous than the average DB plan.¹

Accrual profiles in cash balance and pension equity plans are based on prototypical plans. The cash balance plan estimates assume an interest credit rate of 7 percent and pay credit rates that rise with years in service. Pay credits are set equal to 3.2 percent of salary for years 1 to 5, 4.8 percent for years 6 to 10, 6.4 percent for years 11 to 20, and 8.0 percent after year 20. These pay credit rates are equal to the average rate that cash balance plans would pay to provide benefits about as generous as traditional DB plans (Johnson and Uccello, 2003). The pension

equity plan defines final average pay as mean annual salary over the last five years of employment. Pay credit rates in the pension equity plan also increase with years of service. We set them at 2.6 percent for years 1 to 5, 3.8 percent for years 6 to 10, 5.1 percent for years 11 to 20, and 6.4 percent after years 20. This pension equity plan generates about the same level of pension wealth as the cash balance plan at age 60 (for workers with identical earnings histories who join the plans at age 25).

As shown in Figure 12, pension accruals in traditional DB plans are minimal at young ages, grow rapidly in the late 40s and 50s as workers approach retirement age, and then become negative as workers lose pension wealth when they remain at work past the plan's retirement age. For workers in their early 60s who have participated in the DB plan since age 25, for example, pension wealth declines on average by about 14 percent of annual salary each year. These sharp drops in pension wealth provide strong incentives to retire. By contrast, the prototypical hybrid plans we modeled reward work at older ages. In both the cash balance plan and the pension equity plan, accruals as a share of annual salary increase gradually over the career, because these prototypical plans tie pay credit rates to years of service.

But pension equity plans do not always reward work at older ages. In some plans, for example, pay credit rates are uniform throughout the career, instead of increasing with years of service as in the prototypical plan we modeled. In these plans, pension accrual rates would decline slowly over time, as the opportunity cost of foregone investment income on the account balance grows. Accruals can even become negative in pension equity plans if the account balance is large, interest rates are high, and salaries grow relatively slowly, providing workers with strong incentives to retire. Thus, the specifics of the plan design, not just the plan format, play important roles in creating incentives to remain at work at older ages. In cash balance

plans, by contrast, accrual rates are never negative, even if the pay credit rates do not grow with years of service, because the account balance earns interest at approximately the same rate whether the participants remain with the employer or leave.

Another shortcoming of traditional DB plans in promoting work at older ages is that they often provide little incentive for older workers to join new employers after leaving one job for voluntary or involuntary reasons. Accrual rates in the years immediately following vesting are often quite large in traditional plans for workers hired a few years before the plan's normal retirement age, because benefits are not discounted far into the future. But accrual rates drop sharply after the normal retirement age. For those hired after age 65, accrual rates in traditional plans are often minimal, because each additional year of work reduces the length of the stream of annuity benefits. In cash balance and pension equity plans, by contrast, accrual rates generally do not vary by age at hire, because the value of retirement benefits do not depend on life expectancy at retirement. Hybrid plans, then, generally provide workers with stronger incentives to join employers at older ages than traditional plans.

Conclusion

As the population ages and young workers become increasingly scarce, employers are now searching for ways to increase labor supply among older adults. They can no longer turn to the surge of baby boomers entering the market or the rising tide of female employment to meet the demand for labor. Given improvements in health status and declines in physical job demands, many Americans are able to work until late in life. Most, however, choose not to work beyond their early 60s, instead spending almost one-third of their adult lives in retirement. In addition to limiting the pool of workers available to produce the goods and services necessary to keep the economy growing rapidly, low employment rates at older ages reduce the tax revenue

needed to finance government services, including retirement programs, and increase the burden on younger workers who must support the retired population.

A number of factors contribute to the reluctance of older adults to remain in the labor force, including the presence of generous public and private retirement systems that allow many seniors to live comfortably without having to work for pay, outmoded laws that make it difficult for people to collect retirement benefits while working part-time (which many older adults prefer to full-time work), and social mores stipulating that careers end by age 60 to 65. Traditional DB pension plans also discourage work at older ages. Many of these plans subsidize benefits for those who retire early, often as young as age 55, or, put differently, penalize work past that age. And most plan participants lose lifetime pension benefits by remaining at work past the age at which they can first receive full benefits, because the boost in annual benefits that comes from working an additional year is typically not large enough to offset the year of lost payments. As a result, workers with DB plans retire about two years earlier, on average, than otherwise identical workers with DC plans (Friedberg and Webb, 2003), which do not include feature these work disincentives. Although DB plans have been declining in popularity over the past two decades, they continue to enroll a sizeable share of the workforce, and they remain the dominant type of retirement plan offered in the public sector and among large unionized employers.

The incentive structure of traditional DB plans is quite unusual. In typical DB plans, the value of working an additional year, in terms of lifetime pension benefits, resembles a hill-shaped curve, with few benefits at the beginning or end, but very large economic accruals in middle years. To accumulate substantial retirement benefits, workers generally have to stay on the job for a long time, and employers are able to keep the costs of DB plans down because the plans impose heavy penalties on workers who separate before the age of retirement. Many

workers, who are becoming increasingly mobile and change jobs multiple times over the course of their careers, are unlikely to accrue much pension wealth in traditional DB plans. In effect, DB plans favor a select group of longer-term employees, often in late middle-age, but disfavor both younger and older workers.

Unlike traditional DB plans, hybrid pension plans, such as cash balance plans and pension equity plans, often reward work at older ages at least as much as work at younger ages, because workers in hybrid plans do not forego a year of benefits for every year that they remain on the job past the retirement age. Instead, their account balances continues to grow as long as they remain at work. And hybrid plans generally do not subsidize workers who elect to retire early. Although these plans have been a source of continuing controversy in recent years, they appear to be one response—among many—to the new demographics of the labor market, in which older individuals will become the largest source of potential labor in the economy.

We are not suggesting, however, that the newer types of hybrid plans are the only, or even necessarily the best, means of adapting any particular employer's pension plan to meet the new demands of the labor force. DB plans might be reformed in other ways, such as indexing benefits from the time that the worker leaves the job, much as hybrid plans provide an interest rate return on prior accumulations. Employers can also eliminate early retirement provisions from DB plans that subsidize workers who retire at young ages. Government or private policy might allow newer types of DC plans to be offered to workers with more traditional DB plans who stay on the job after reaching some plan retirement age. Moreover, adoption of a hybrid plan format does not guarantee a retirement plan that provides strong work incentives at older ages. Pension equity plans, in particular, can include features that actually encourage early retirement. For example, if pay credits do not increase fast enough with years of service, and

salaries rise slowly or not at all, participants might be able to increase their retirement savings by leaving the employer and investing the account balance themselves than by remaining in the plan. And pension equity plans that tie benefits to final average salary may discourage older workers who prefer to reduce their hours and earnings from remaining on the job. Design features require careful scrutiny as employers come to terms with the new realities of the labor market.

References

- Allen, Everett T., Joseph J. Melone, Jerry S. Rosenbloom, and Dennis F. Mahoney. 2003. *Pension Planning: Pension, Profit-Sharing, and Other Deferred Compensation Plans*. Ninth edition. New York: McGraw-Hill/Irwin.
- Arias, Elizabeth, and Betty L. Smith. 2003. "Deaths: Preliminary Data for 2001." *National Vital Statistics Reports* 51(5): 1-48.
- Berman, Jay M. 2001. "Industry Output and Employment Projections to 2010." *Monthly Labor Review* 124(11): 39-56.
- Bernan Press. 2003. *Handbook of U.S. Labor Statistics*. Sixth Edition. Lanham, MD: Bernan Press.
- Burman, Leonard E., Richard W. Johnson, and Deborah I. Kobes. 2003. "Annuitization Rates Among Older Adults in Defined Contribution Plans: Evidence from the HRS." Final Report to the Employee Benefits Security Administration, U.S. Department of Labor. Washington, D.C.: The Urban Institute.
- Costa, Dora L. 1998. *The Evolution of Retirement: An American Economic History, 1880-1990*. Chicago: University of Chicago Press.
- Costa, Dora L. 2002. "Changing Chronic Disease Rates and Long-term Declines in Functional Limitation Among Older Men." *Demography* 39(1): 119-138.
- Crimmins, Eileen M., Sandra L. Reynolds, and Yasuhiko Saito. 1999. "Trends in Health and Ability to Work Among the Older Working-Age Population." *Journal of Gerontology: Social Sciences* 54B(1): S31-S40.

- Farber, Henry W. 1999. "Mobility and Stability: The Dynamics of Job Change in Labor Markets." In *Handbook of Labor Economics*, Vol. 3B, eds. Orley Ashenfelter and David Card. Amsterdam: Elsevier Science B.V: 2439-83.
- Friedberg, Leora, and Anthony Webb. 2003. "Retirement and the Evolution of Pension Structure." NBER Working Paper No. 9999. Cambridge, Mass.: National Bureau of Economic Research.
- Gustman, Alan, Olivia Mitchell, Andrew Samwick, and Thomas Steinmeier. 1999. "Pension and Social Security Wealth in the Health and Retirement Study." In *Wealth, Work, and Health: Innovations in Measurement in the Social Sciences*, eds. James Smith and Robert Willis. Ann Arbor, MI: University of Michigan Press: 150-208
- Hamilton, Brady E., Joyce A. Martin, and Paul D. Sutton. 2003. "Births: Preliminary Data for 2002." *National Vital Statistics Reports* 51(11): 1-19.
- Idler, Ellen L., and Yoav Benyamini. 1997. "Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies." *Journal of Health and Social Behavior* 38(1): 21-37.
- Johnson, Richard W. 2003. "Trends in Job Demands Among Older Workers, 1992-2002." Washington, D.C.: The Urban Institute.
- Johnson, Richard W., and Cori E. Uccello. 2003. "Cash Balance Plans and the Distribution of Pension Wealth." *Industrial Relations* 42(4): 745-773.
- Manton, Kenneth G., and XiLiang Gu. 2001. "Changes in the Prevalence of Chronic Disability in the United States Black and Nonblack Population Above Age 65 from 1982 to 1999." *Proceedings of the National Academy of Sciences* 98(11): 6354-59.

- National Center for Health Statistics. 2003. Data Warehouse on Trends in Health and Aging. Available at <http://www.cdc.gov/nchs/agingact.htm>.
- Penner, Rudolph G., Pamela Perun, and Eugene Steuerle. 2002. "Legal and Institutional Impediments to Partial Retirement and Part-Time Work by Older Workers." Washington, D.C.: The Urban Institute.
- Plunkert, Lois M. 1990. "The 1980s: A Decade of Job Growth and Industry Shifts." *Monthly Labor Review* 113(9): 3-16.
- President's Commission to Strengthen Social Security. 2001. *Strengthening Social Security and Creating Personal Wealth for All Americans*. Washington, D.C.: President's Commission to Strengthen Social Security.
- Purcell, Patrick J. 2003. "Older Workers: Employment and Retirement Trends." CRS Report for Congress. Washington, D.C.: Congressional Research Service.
- Social Security Administration. 1986. *Increasing the Retirement Age: Effect on Older Workers in Physically Demanding Occupations or Ill Health*. Washington, D.C.: U.S. Social Security Administration.
- Social Security Administration. 2003a. "United States Life Table Functions and Actuarial Functions at 3.0 Percent Interest for Females Born in 1938, Based on the Alternative 2 Mortality Probabilities Used in the 2003 Trustees Report." Personal correspondence from Felicitie Bell.
- Social Security Administration. 2003b. "United States Life Table Functions and Actuarial Functions at 3.0 Percent Interest for Males Born in 1938, Based on the Alternative 2 Mortality Probabilities Used in the 2003 Trustees Report." Personal correspondence from Felicitie Bell.

Steuerle, C. Eugene. Forthcoming. "The Incredible Shrinking Budget for Working Families and Children." Washington, DC: The Urban Institute.

Steuerle, Eugene, and Adam Carasso. 2001. "A Prediction: Older Individuals Will Work More in the Future." Straight Talk on Social Security and Retirement Policy No. 32. Washington, D.C.: The Urban Institute.

Steuerle, Eugene, and Christopher Spiro. 1999. "Adjusting for Life Expectancy in Measures of Labor Force Participation." Straight Talk on Social Security and Retirement Policy No. 10. Washington, D.C.: The Urban Institute.

Steuerle, Eugene, Christopher Spiro, and Richard W. Johnson. 1999. "Can Americans Work Longer?" Straight Talk on Social Security and Retirement Policy No. 5. Washington, D.C.: The Urban Institute.

Toder, Eric, Lawrence H. Thompson, Melissa Favreault, Richard W. Johnson, Kevin Perese, Caroline Ratcliffe. 2002. "Modeling Income in the Near Term: Revised Projections of Retirement Income Through 2020 for the 1931-1960 Birth Cohorts." Final Report to the Social Security Administration. Washington, D.C.: The Urban Institute.

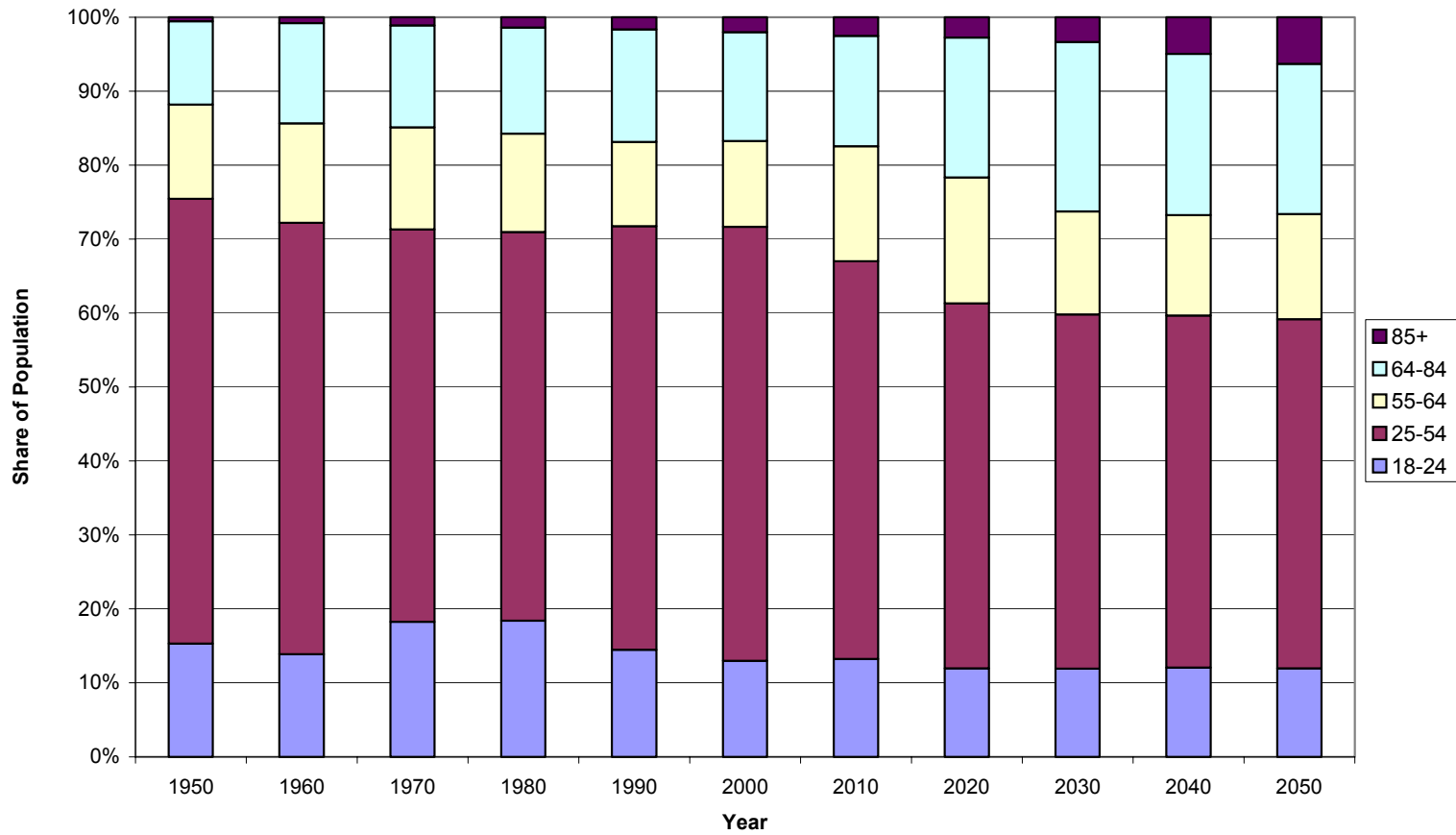
U.S. Bureau of Labor Statistics. 2003a. "Employment status of the civilian noninstitutional population, 1940 to date." Available at <ftp://ftp.bls.gov/pub/special.requests/lf/aat1.txt>.

U.S. Bureau of Labor Statistics. 2003b. *National Compensation Survey: Employee Benefits in Private Industry in the United States, 2000*. Bulletin 2555. Washington, D.C.: U.S. Department of Labor.

U.S. Census Bureau. 2001a. "National Population Estimates for the 1990s." Available at http://eire.census.gov/popest/archives/national/nat_90s_detail/nat_90s_1.php.

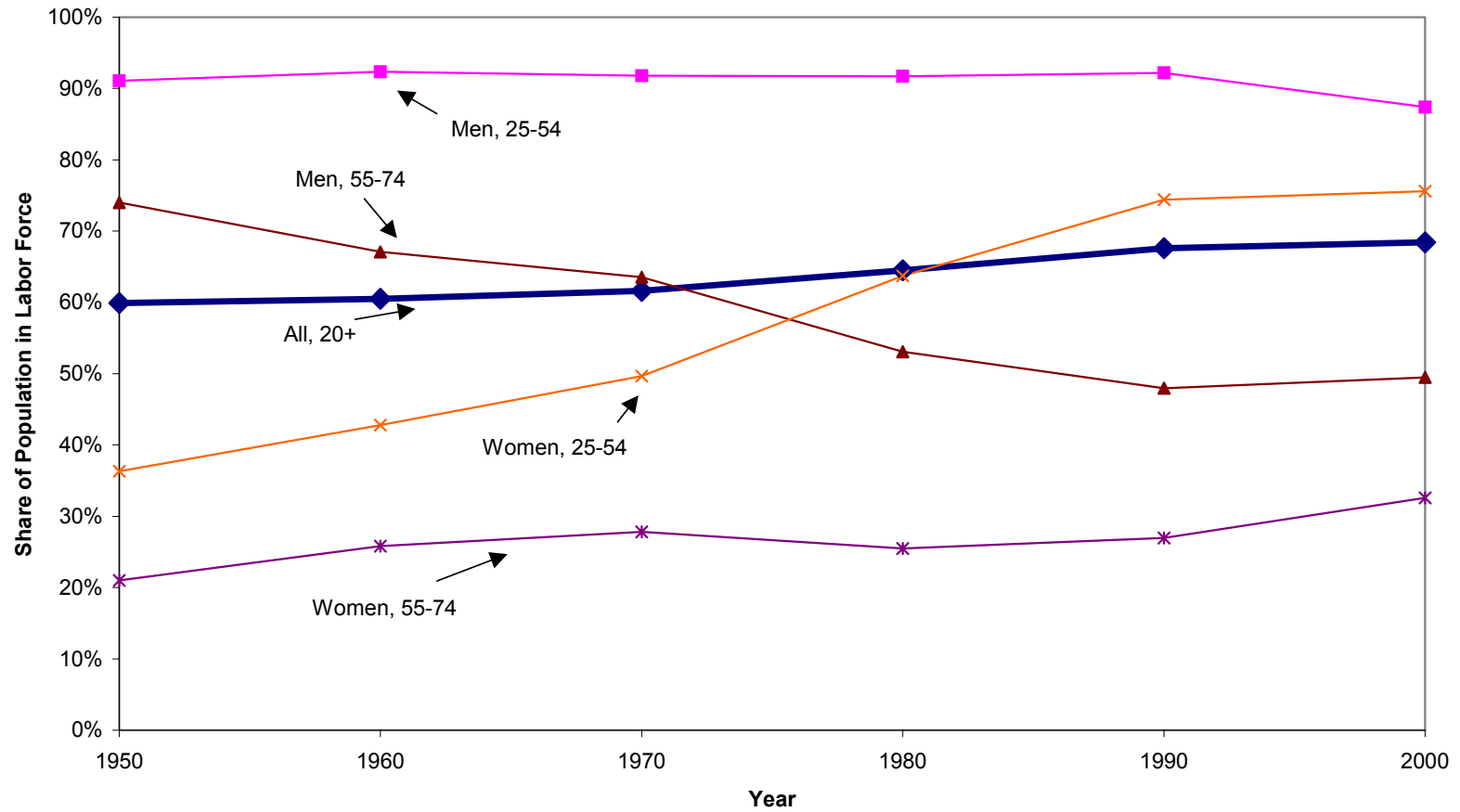
- U.S. Census Bureau. 2001b. "Quarterly Population Estimates, 1980 to 1990." Available at http://eire.census.gov/popest/archives/national/nat_80s_detail.php.
- U.S. Census Bureau. 2002a. "Projections of the Total Resident Population by 5-Year Age Groups, and Sex with Special Age Categories: Middle Series, Assorted Years." Available at <http://www.census.gov/population/www/projections/natsum-T3.html>.
- U.S. Census Bureau. 2002b. "DP-1: Profile of General Demographic Characteristics: 2000." Available at http://factfinder.census.gov/servlet/QTTable?ds_name=DEC_2000_SF1_U&geo_id=01000US&qr_name=DEC_2000_SF1_U_DP1.
- U.S. Census Bureau. Various years. *Statistical Abstract of the United States*. Washington, D.C.: Government Printing Office.
- U.S. General Accounting Office. 2000. *Cash Balance Plans: Implications for Retirement Income*. GAO/HEHS-00-207. Washington, D.C.: U. S. General Accounting Office.
- U.S. National Center for Health Statistics. 1999. *Vital Statistics of the United States 1993*. Volume 1 – Natality. Washington, D.C.: U.S. Government Printing Office.
- U.S. National Center for Health Statistics. 2002. *Health, United States, 2002*. Hyattsville, Maryland: U.S. National Center for Health Statistics.
- U.S. Pension and Welfare Benefits Administration. 2001-2002. *Private Pension Plan Bulletin: Abstract of 1998 Form 5500 Annual Reports*. Washington, D.C.: U.S. Department of Labor.

Figure 1. Age Distribution of the Adult U.S. Population, 1950-2050



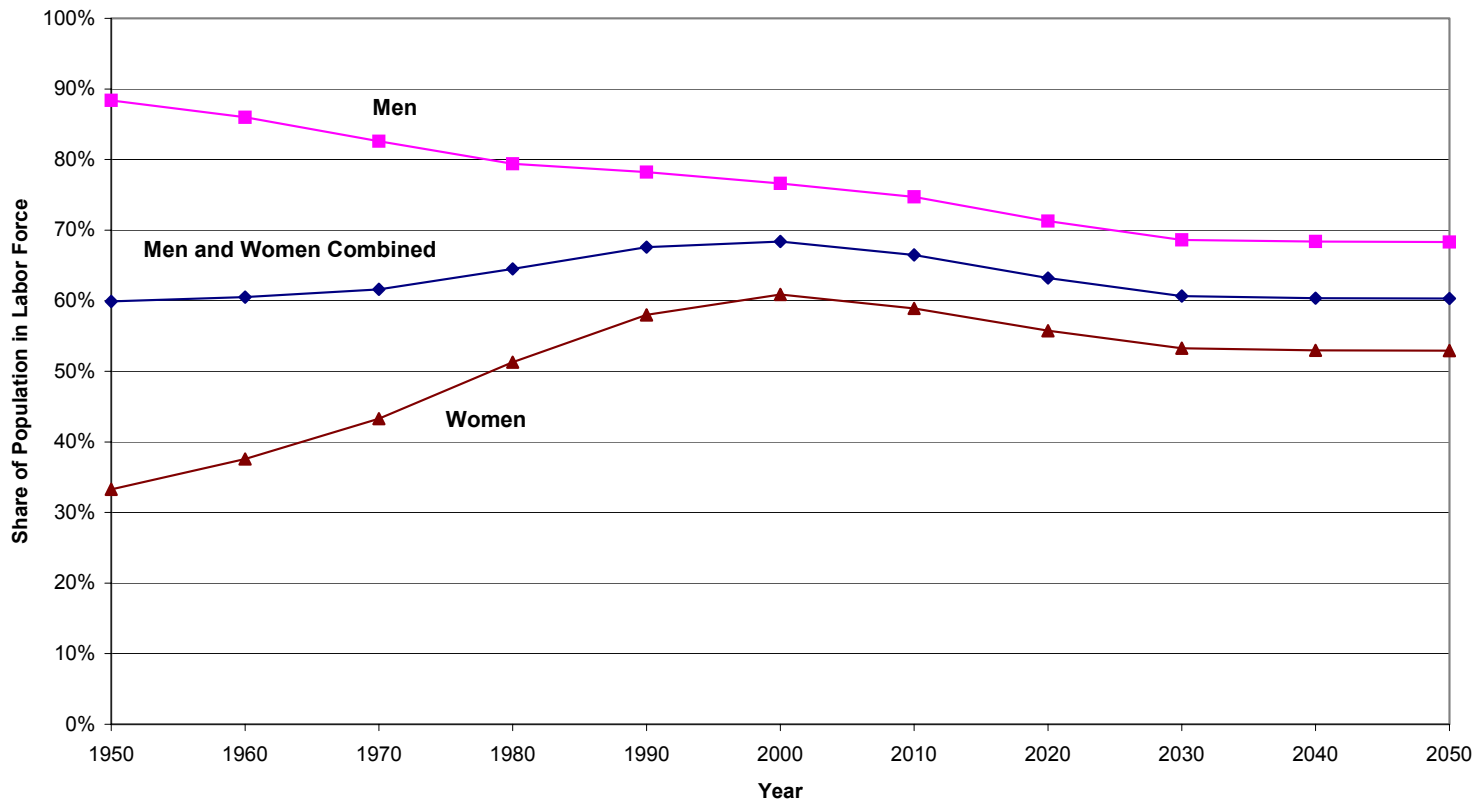
Source: Authors' estimates from U.S. Census Bureau (2001a, 2001b, 2002a, 2002b, various years).

Figure 2. Labor Force Participation Rates by Age and Gender, 1950-2000



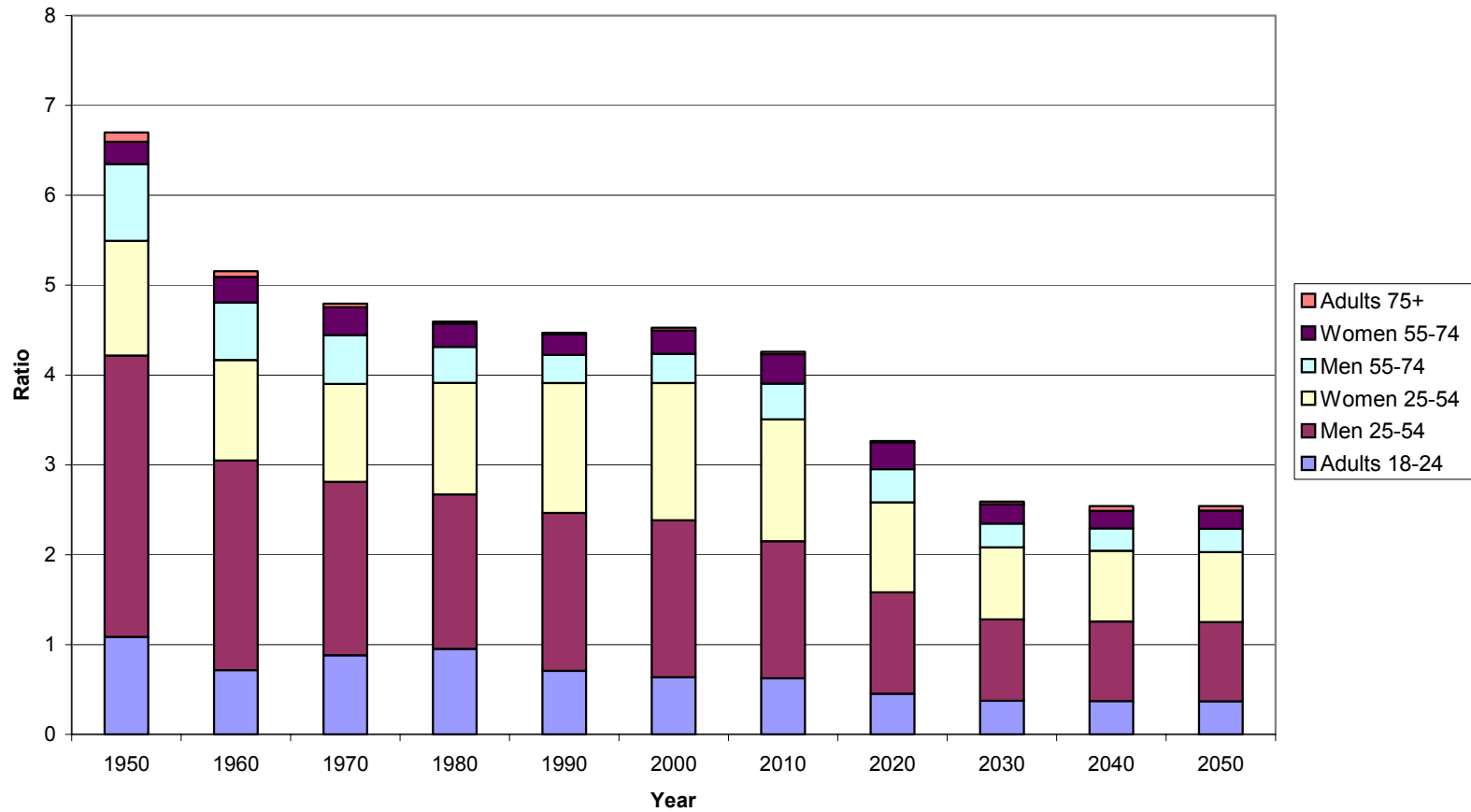
Source: Authors' tabulations from BLS data (Bernan Press 2003).

**Figure 3. Labor Force Participation Rates, Adults Ages 20+, 1950-2050
(Assuming 2000 Rates by Age and Gender Continue)**



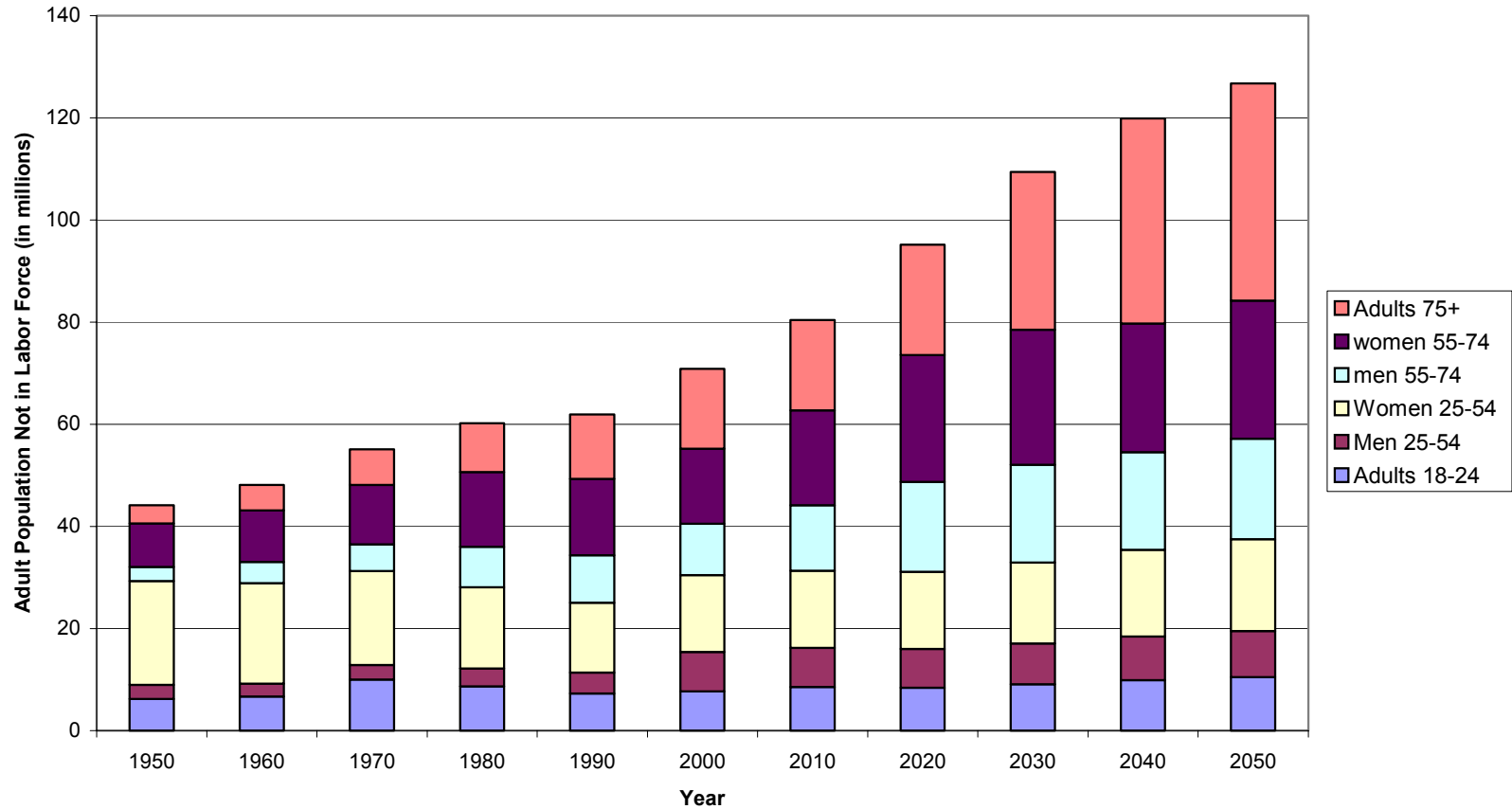
Source: Authors' tabulations from U.S. Census Bureau (2001a, 2001b, 2002a, 2002b, various years) and BLS (Bernan Press 2003) data.

**Figure 4. Number of Workers Per Adults Ages 65+ Not in Labor Force
(Assuming 2000 Labor Force Participation Rates by Age and Gender Continue)**



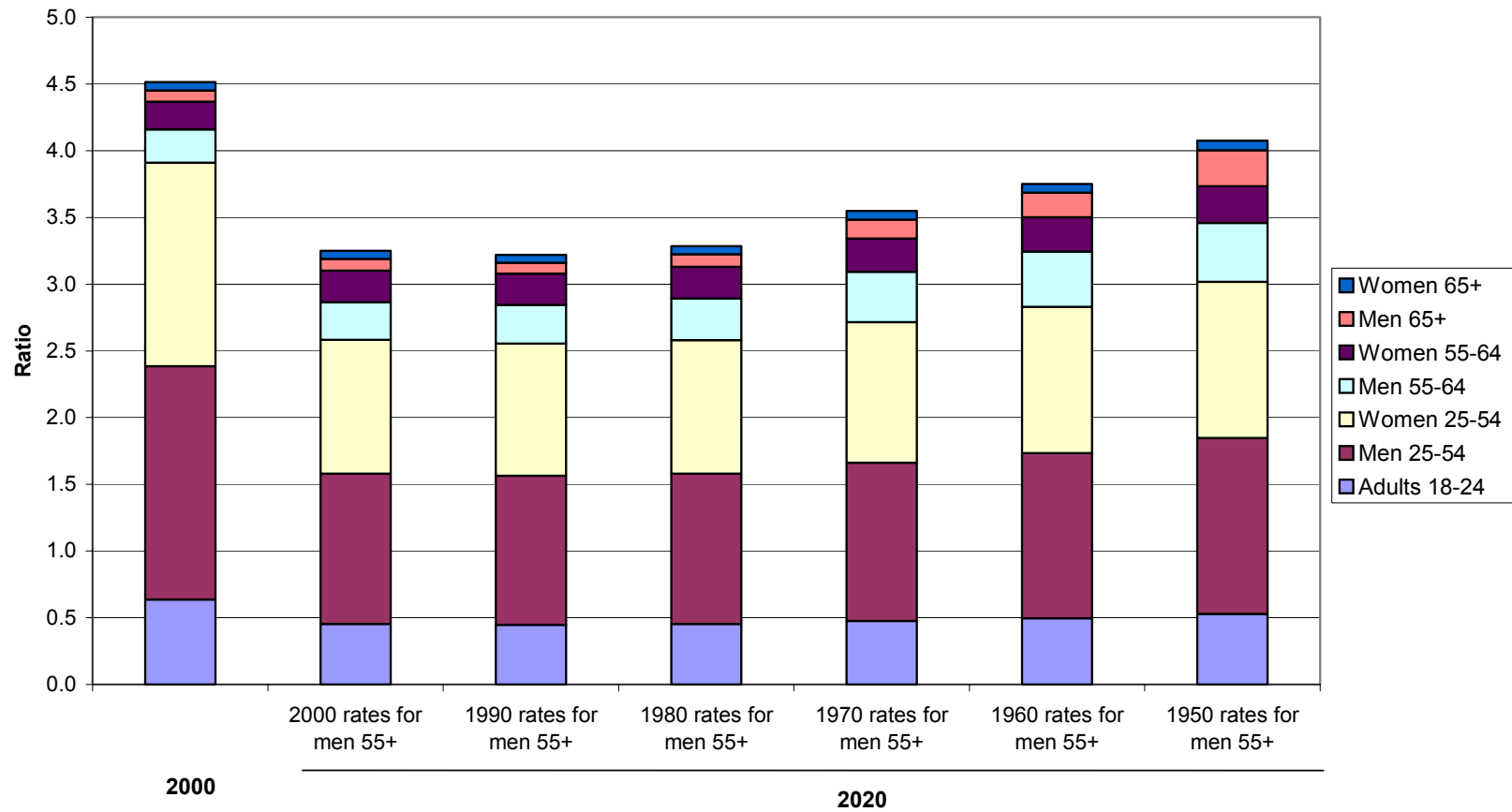
Source: Authors' estimates from U.S. Census Bureau (2001a, 2001b, 2002a, 2002b, various years) and BLS (Bernan press 2003) data.

Figure 5. Size of Adult population Not in the Labor Force, 1950-2000
 (Assuming 2000 Labor Force Participation Rates by Age and Gender Continue)



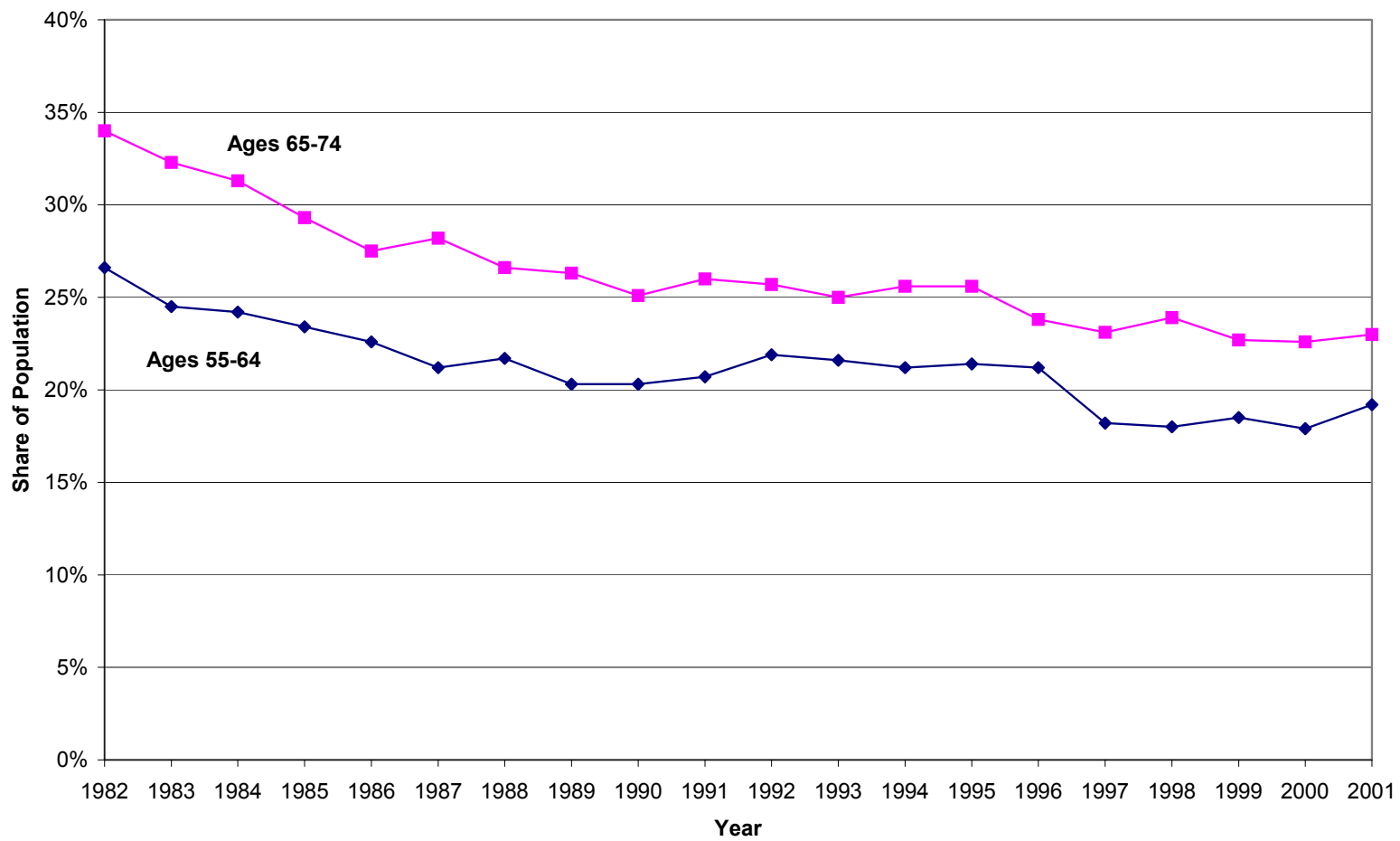
Source: Authors' estimates from U.S. Census Bureau (2001a, 2001b, 2002a, 2002b, various years) and BLS (Bernan press 2003) data.

Figure 6. Number of Workers 18+ Per Adults Ages 65+ Not in Labor Force, 2000 and 2020, Under Alternative Assumptions About Participation Rates for Men Ages 55+



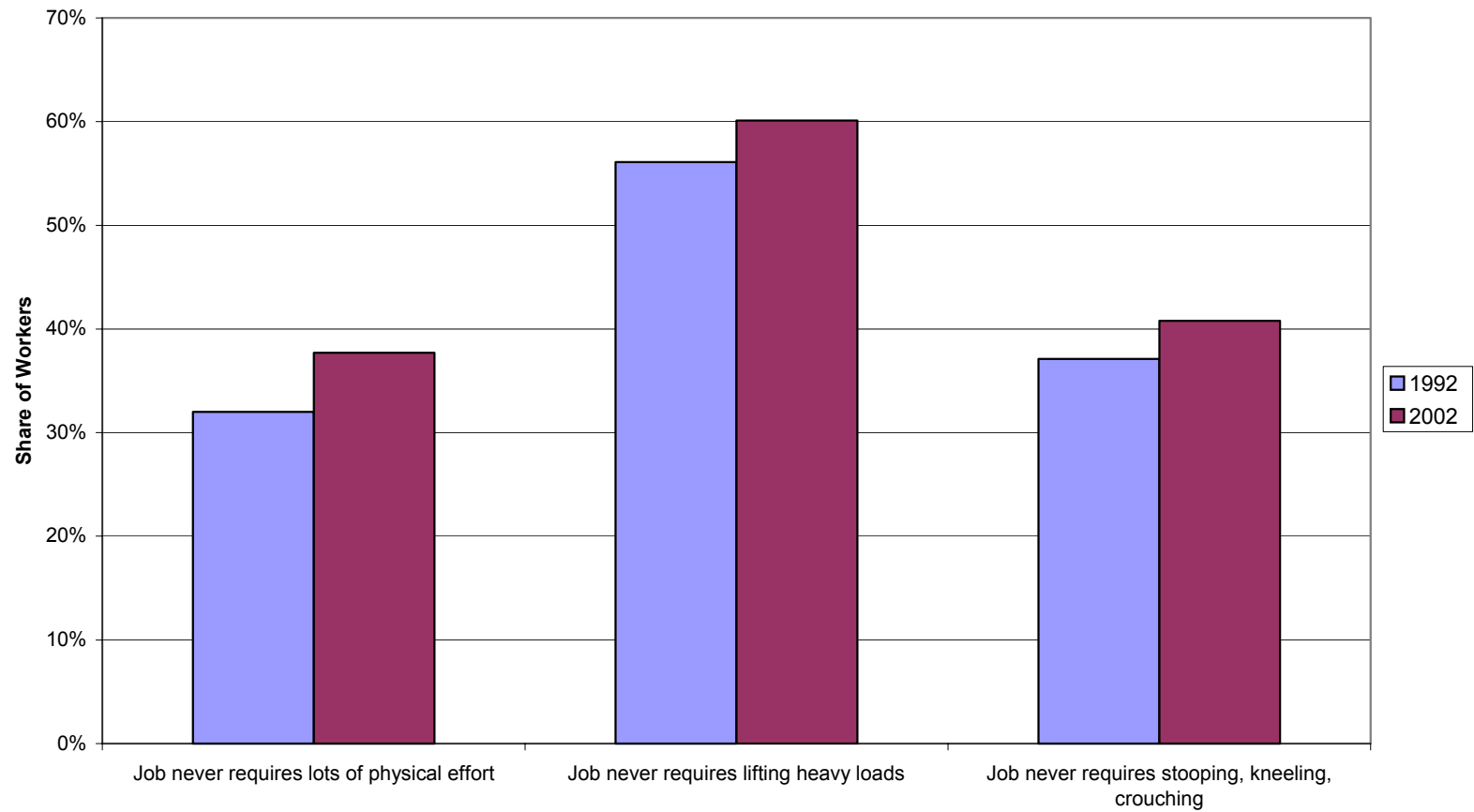
Source: Authors' estimates from U.S. Census Bureau (2001a, 2001b, 2002a, 2002b, various years) and BLS (Bernan press 2003) data.

Figure 7. Share of Older Adults Reporting Fair or Poor Health, 1982-2001



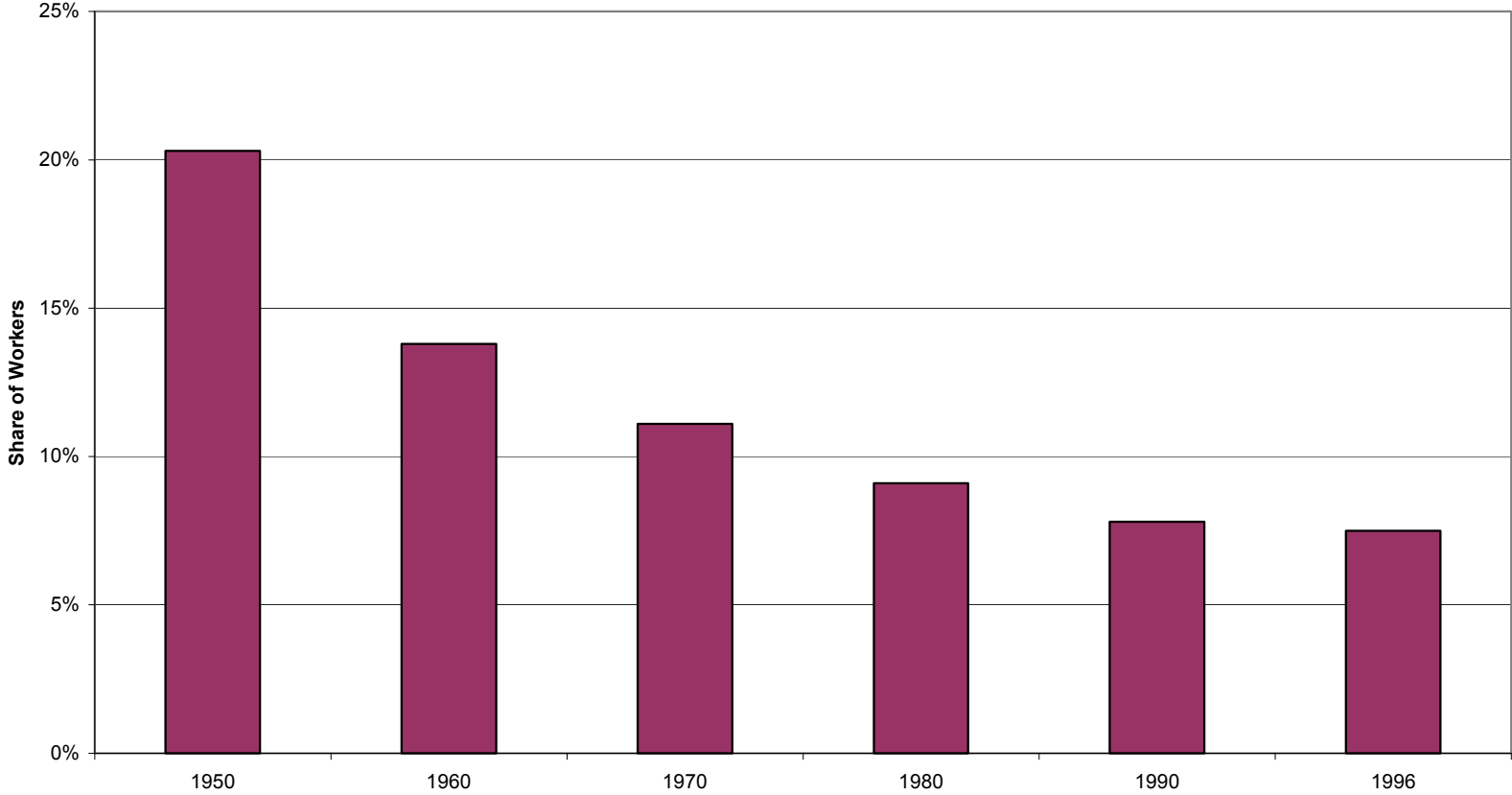
Source: National Center for Health Statistics (2003).

Figure 8. Job Requirements of Workers Ages 55-60, 1992 and 2002



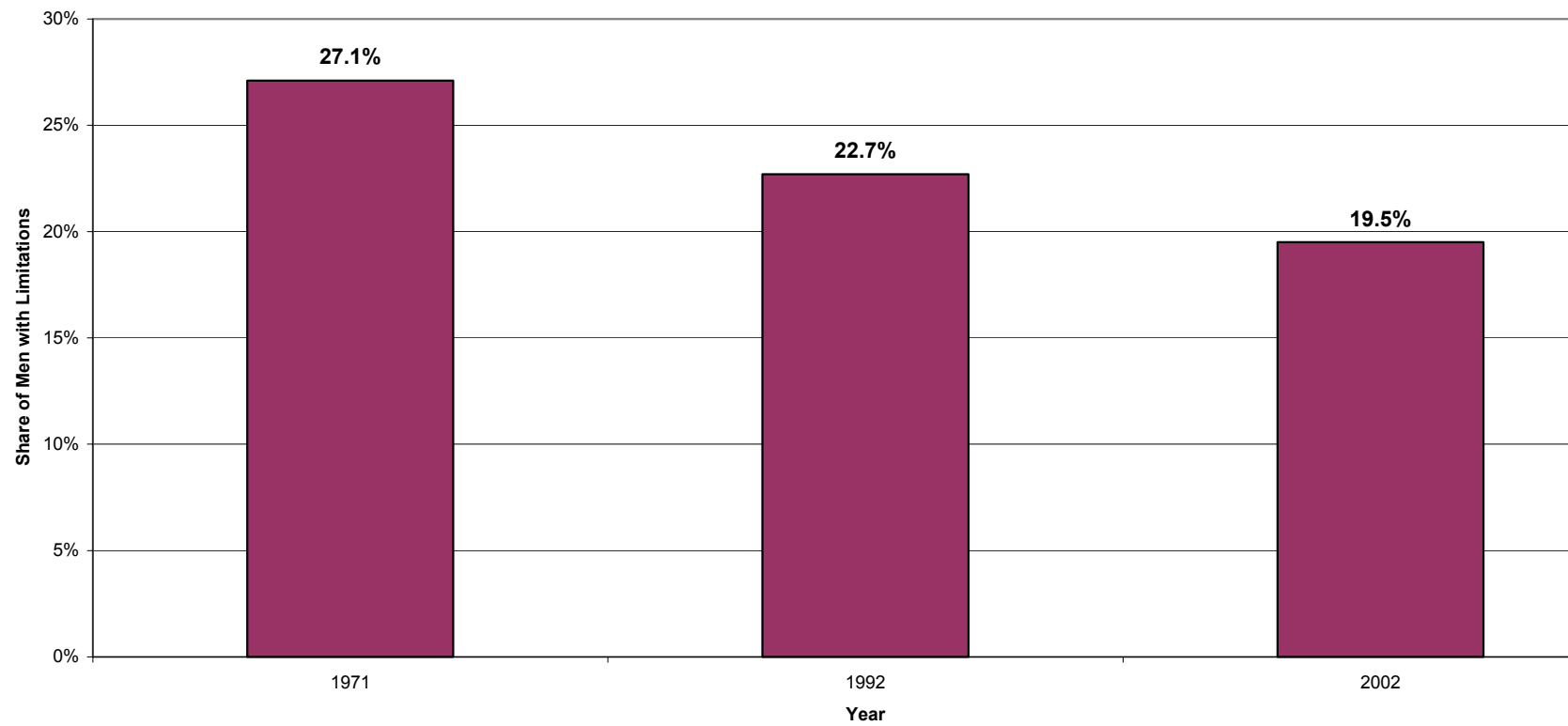
Source: Johnson (2003).

Figure 9. Share of U.S. Workers in Physically Demanding Jobs



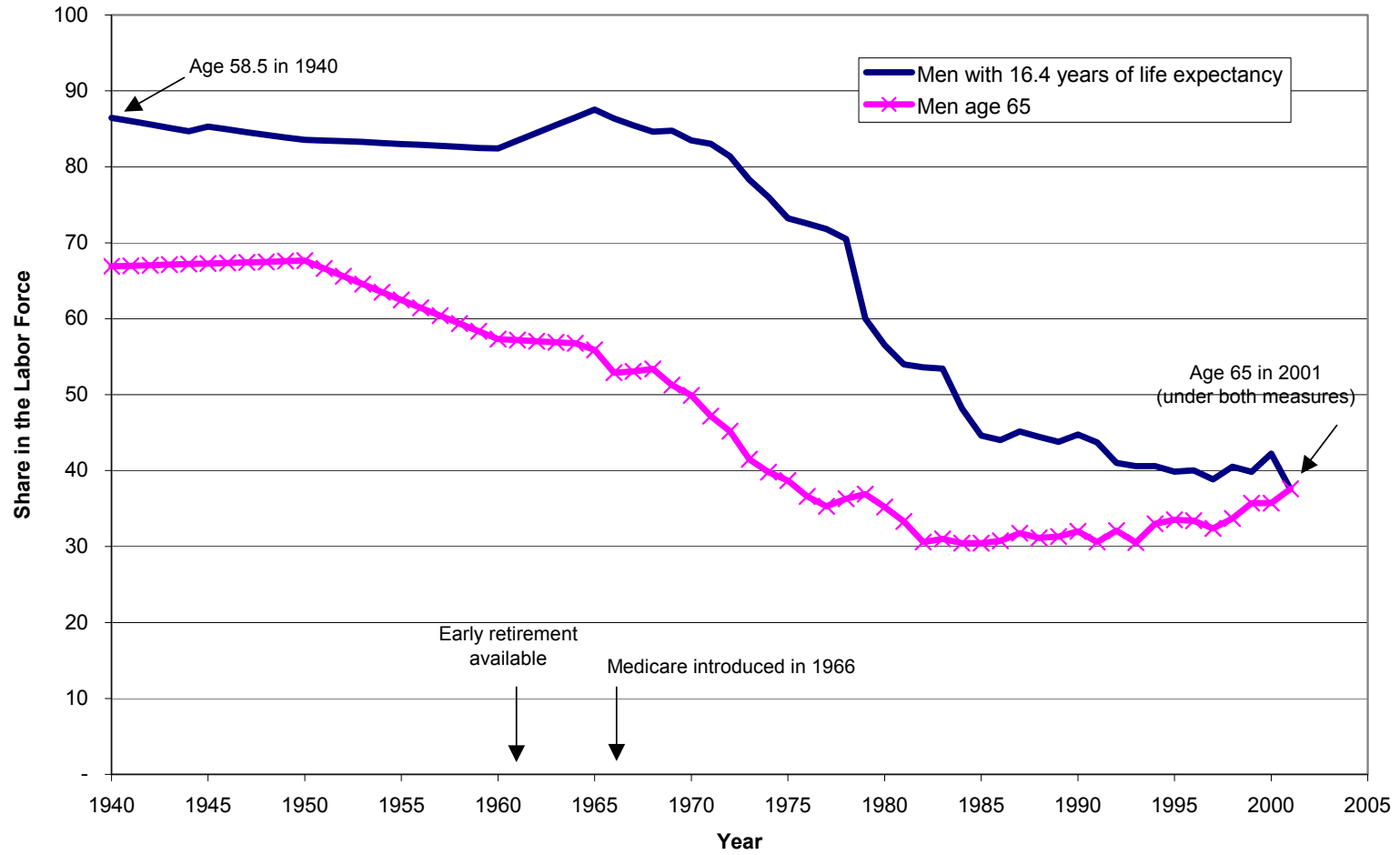
Source: Social Security Administration (1986) and Steuerle, Spiro, and Johnson (1999).

Figure 10. Share of Men Ages 55-59 with Work Limitation, 1971, 1992, 2002



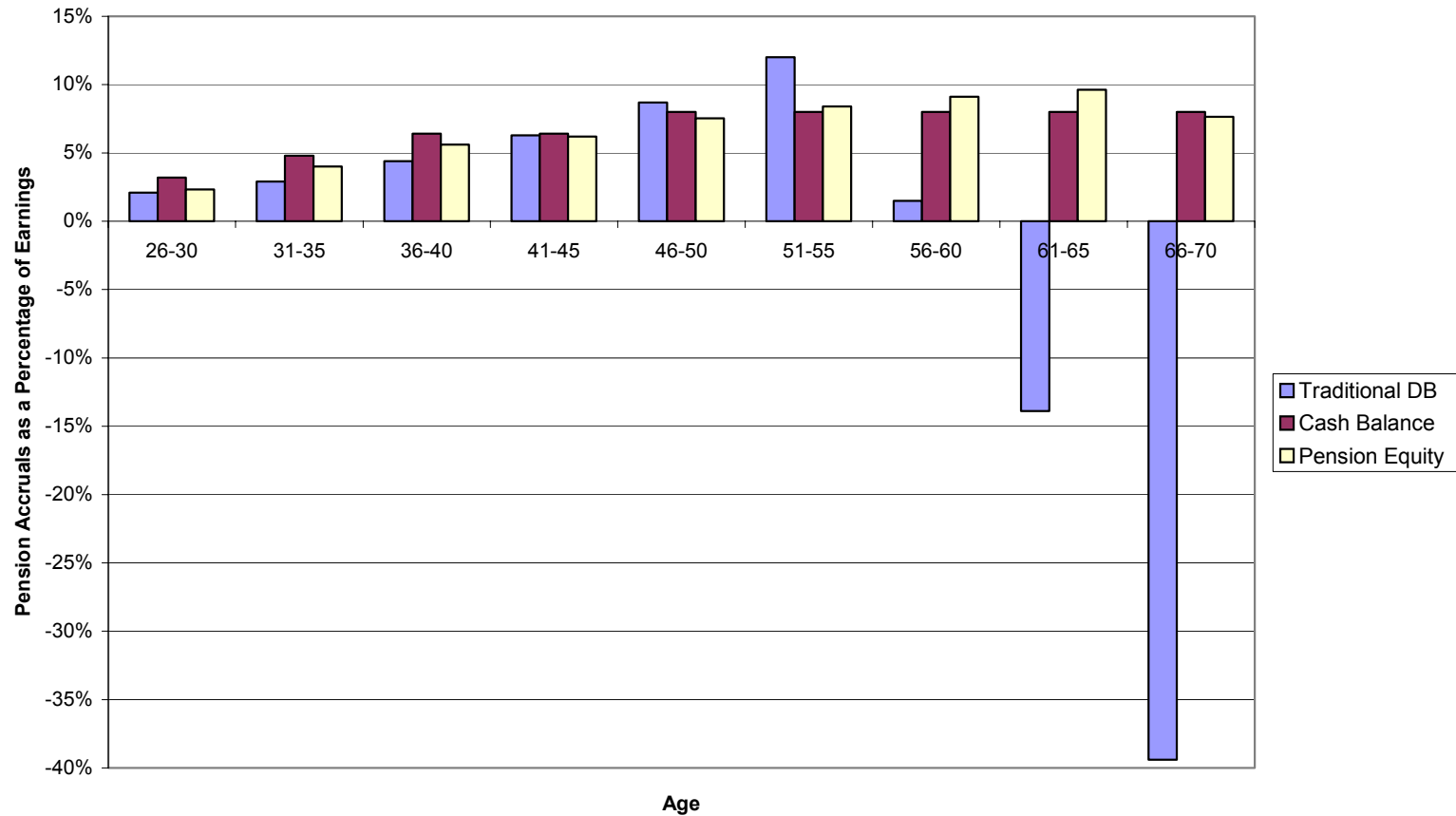
Source: Authors' estimates from the National Longitudinal Survey of Older Men and the Health and Retirement Study.

Figure 11. Male Labor Force Participation Rates, 1940-2001



Source: Updated from Steuerle and Spiro (1999).

Figure 12. Average Accrual in Traditional DB Plans and Hybrid Plans



Note: Estimates assume that workers begin employment at age 25. See text for additional assumptions.

Source: Penner, Perun, and Steuerle (2002) and authors' estimates.

Endnotes:

¹ Private communication with PBGC staff.