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SIEPR Discussion Paper No. 13-017

The Impact of Later Retirement on Government Budgets

By

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THE BROOKINGS INSTITUTION

Revised October 15, 2013

IN OCTOBER 2013 BROOKINGS PUBLISHED a book entitled *Closing the Deficit: How Much Can Later Retirement Help?*¹ This essay discusses the research strategy and some of the main conclusions of the volume. The research was funded by the Alfred P. Sloan Foundation as part of its “Working Longer” program. The overall project was a joint undertaking of Brookings, the Urban Institute, and Moodys.com, the macroeconomics forecasting company. Henry Aaron and I coedited and wrote a substantial portion of the book. Karen Smith and Richard Johnson of the Urban Institute performed some of the crucial analyses and described them in a key chapter. John Shoven wrote the concluding essay, and other public finance and labor economists contributed brief discussions of the analysis.

The volume tries to answer three main questions:

- What are the budget impacts of a rise in the average age at retirement – assuming that delayed retirement occurs *without any change in current program eligibility requirements or benefit formulas*?
- How can we—and how *should* we—take policy steps to encourage Americans to retire later? What would those policy measures look like? Who would the measures help? Who would they hurt?
- Can the policy measures be designed in a way that offers humane protection to workers who find it hard to stay employed late in life—possibly because of ill-health, possibly because of the misfortune of working in a declining industry, occupation, or firm?

The current essay focuses on the first of these questions, the impact of a retirement age delay assuming none of the current institutions that help pay for retirement is changed. In order to answer that question the project participants had to establish a baseline retirement trend against which we could assess a delay in the age of labor force exit. Crucially for our project, it turns out that the average age at retirement has been increasing for the past 20 years or, in the case of women, almost 30 years.

¹ Gary Burtless and Henry Aaron (eds.), *Closing the Deficit: How Much Can Later Retirement Help?* (Washington, DC: Brookings, 2013).

The remainder of this essay examines the longer-term record of retirement in the United States, the choice of a baseline path of future retirement trends and an alternative path reflecting a faster trend toward later retirement. Finally, I discuss our estimates of the impact of a later retirement trend on federal government taxes and revenues.

The findings can be summarized briefly. The basic question addressed by our project was “Can working longer solve the nation’s budget problems?” Our answer is “No,” but “No” with an asterisk. Using the delayed retirement scenario we considered, plus the long-run estimates of the deficit under CBO’s “current law” baseline, we find that later retirement would eliminate 4 percent to 7 percent of the deficit between now and 2020. (The current-law deficit projections were taken from Congressional Budget Office forecasts available when the project was completed late last year. The near-term deficit outlook has improved since then.) Our projection of an accelerated trend toward later retirement would knock 15 percent or 16 percent off the deficit in 2021-2030, and it would cut the deficit between 2031 and 2040 by about one-quarter. Clearly, the budget problem is not solved, but delayed retirement takes a sizeable bite out of the problem, especially in the decades after 2020. In 2040, the current law federal budget deficit would be reduced by almost 40 percent.

Unfortunately, no one—including the CBO—thinks its 2012 “current law” baseline was realistic. That scenario assumed tax increases and future budget cuts currently written into law will actually take place. If they do take place, the country really does not have a deficit problem. Under the “current law” forecast published by CBO in late summer 2012, the federal deficit was only about 1.0 percent of GDP after 2020. A deficit that size is not a problem, except in the minds of people who do not have anything else to worry about. Those projected deficits were small enough so the federal debt as percent of GDP declines continuously after 2015.

Under CBO’s “alternative” and more realistic 2012 forecast, Congress will extend many tax provisions that were scheduled to end under current law, and it will prevent draconian spending cuts from occurring. If we accept the 2012 “alternative” CBO budget forecast, later retirement eliminates just 1 percent to 2 percent of the deficit over the next decade, cuts about 3 percent off the deficit between 2021 and 2030, and takes just 2 percent or 3 percent off the deficit between 2031 and 2040. In other words, if Americans retire later it will make hardly any difference to the long-term budget outlook.

A delay in labor force exit could have other beneficial effects besides its impact on the deficit, of course. For example, it would boost the incomes of people who continue to work and of retirees who have spent more years accumulating retirement savings. Some old people will have more income because they are working; others will have bigger pensions or Social Security checks because they delayed claiming a pension. The Urban Institute’s microsimulation model suggests that some of the biggest proportional income gains would be obtained by the elderly in the lower ranks of the income distribution. That is because the educated and affluent elderly

already tend to retire at later ages, so later retirement will not produce a large proportional impact on their incomes.

Recent trends in labor force exit

The average retirement age is increasing, a trend that has been underway for at least the past two decades. The Social Security Trustees expect the trend will continue. Increases in employment among the elderly since the early 1990s represent a reversal of the trend toward earlier retirement that lasted more than a century, up through the middle to late 1980s. Some people may be under the impression that the trend toward later retirement came to an end as a result of the Great Recession in 2008-2009. That impression is incorrect. Among adults past age 62 labor force participation rates continue to edge up. Notwithstanding the severity of the downturn and the weakness of the recovery, the employment-population ratio of adults past 62 is higher in 2013 than it was at the end of the last economic expansion in 2007.

There is no single, best definition of retirement. Obviously, it involves a drop in work effort that occurs at the end of our careers. Some people consider themselves “retired” even though they continue to work in full-time jobs (possibly ones that are less demanding than the ones they held in mid-career). Others say they are retired when they give up full-time work for a part-time job. And still others do not consider themselves retired until they have stopped working altogether. The most popular indicator of the trend in the average retirement age is the trend in labor force participation rates at older ages.

Suppose we ask “What is the youngest age at which fewer than half of men are in the workforce?” Chart 1 shows the average male retirement age under this straightforward definition. It is calculated using men’s reported work status in the 1910, 1940, 1950, and 1960 decennial censuses plus Bureau of Labor Statistics (BLS) estimates from Current Population Surveys from 1965-2011. The numbers are not perfect, but they show a sizeable drop in the male retirement age during the past century. Over 50 percent of 73-year-old men were in the workforce in 1910. Less than 50 percent of 74-year-old men were in the workforce in that same year. Let us call age 74 the “average retirement age” in 1910. The average retirement age dropped 4 years (to age 70) by 1940. It dropped another 4 years (to age 66) by 1960. Notice that half the drop in the retirement age between 1910 and 1960 occurred before anyone collected a Social Security check. The average retirement age dropped another 4 years (to age 62) in 1994. Since that year the average retirement age has edged up. In 2009, a bad recession year, it reached 65, eliminating about three-quarters of the drop that had occurred between 1960 and 1994.

The “average retirement age” is a crude indicator. We can make a more fine-grained analysis, but it tells a similar story. Chart 2, for example, shows trends in labor force participation of men at ages 60, 62, age 65, and 70 between 1910 and 2011. The drop in participation rates began earlier and was steeper for older men, and began later and was more modest for men near 60. The recent up-tick in older men’s participation rates has been more

noticeable in the case of men at the oldest ages. There has been very little if any increase in participation rates at age 60.

The situation among women mirrors that among men, except that historically women were a lot less likely to work for pay between ages 20 and 55. Chart 3 shows women's labor force participation rates since 1965 among 60-, 62-, 65-, and 70-year-old women. The increase in old-age labor force participation rates began a bit earlier among women than among men, but the gains in old-age work effort are equally impressive.

A common view is that an aging society cannot afford early retirement because workers live longer beyond the standard retirement age. This view tends to overlook the importance of how much people work before they attain the retirement age. The drop in labor force participation rates and employment after age 60 up through about 1990 was more than offset by an increase in participation and employment rates before the standard retirement age. Chart 4 shows the basic numbers for the post-World-War-II period up through 2011. The BLS publishes statistics that give us precise numbers starting in 1948. Over the period from 1948 to 2011 the participation rate of Americans past 65 fell a bit more than 9 percentage points. We also saw a sizeable drop in the participation rate of 16-19 year-olds. Between ages 20 and 64, however, participation rates increased noticeably. This makes it a hard to understand why so many people believe Americans worked longer in the good old days. Between ages 20 and 64 Americans are nowadays more likely to work for pay than was the case after World War II. This is explained, of course, by the sharply increased percentage of 20-64 year-old women who are in the paid workforce.

It is worth emphasizing that the post-war period was divided into two eras. Before 1989 the trend was toward *lower* work rates in old age, with big participation-rate increases at nearly all ages under 65 (Chart 5). Since 1989 the trend has been in the opposite direction, with increasing participation rates in late middle age and at older ages and modest declines in participation under age 50 (Chart 6).

What can we say about the increases in old-age labor supply that occurred after the late 1980s? A chapter in our book describes some of the characteristics of the people who have delayed retirement. It also considers some of the implications of these trends for the earnings of older workers compared with prime-age and younger workers. Here are four questions about the delayed retirement trend and brief answers to those questions:

- *Do workers who postpone retirement earn below-average wages?* On the whole they do not. Since the late 1980s much of the increase in work effort among the aged has been concentrated among workers earning good wages. Workers who earn below-average wages have experienced smaller gains in old-age employment. If we account for early retirements that occur as a result of disability, workers who earn below-average wages are probably leaving the work force at younger ages.

- *Do late retirees have worse-than-average or better-than-average schooling?* Given the answer to the previous question, the answer to this one should not be surprising. People who delay retirement past age 62 tend to have better-than-average education. Even taking into account their educational attainment, however, the workers who delay retirement past the median age of labor force exit tend to earn above-average wages.
- *How is the delay in retirement divided between full-time and part-time work?* Back in the 1980s, when early retirement was the norm, older workers were more likely than younger ones to work on part-time schedules. As the average retirement age has increased there has been a trend toward full-time work among older workers. Workers past 60 are still more likely than younger workers to be in part-time jobs, but the gap is narrowing.
- *How important are “bridge jobs”? How important is lengthening of workers’ career jobs?* “Bridge jobs” are jobs with shorter hours of work or less demanding obligations than workers’ career jobs. Both bridge jobs and longer tenures in career jobs are important in explaining delayed labor force exit. A number of researchers have found that bridge jobs are a significant route for entering retirement. That was true in the mid-1980s, and it remains true today. But there has also been a significant increase in job retention among older workers who remain in the career jobs they held in mid-career. In other words, lengthening work life has meant lengthening career jobs for a lot of the folks who are still at work in their mid- and late-60s. I examined BLS job tenure questionnaires administered over the past quarter century to see how many older workers retain long-tenure jobs that they held in their late 50s and early 60s. It turns out that job retention rates in these long-tenure jobs have been increasing over the past quarter century. Thus, a sizeable share of increased labor supply in old age is connected to workers remaining in their long-tenure jobs more tenaciously now than was the case in the 1980s.

It is worth considering what has been happening to the wages paid to older workers. As already noted, there has been a sizeable increase in the proportion of Americans who remain employed until their middle and late 60s and into their early 70s. In addition, the leading edge of the Baby Boom generation has reached its mid-60s, increasing the proportion of the potential workforce that is between 60 and 67. The increase in the relative supply of 60-67 year-old workers could drive down the relative earnings of older workers, especially if these workers are crowded into particular niches in the job market.

Quite the opposite has been the case, as Chart 7 makes clear. Using the monthly BLS earnings survey in the Current Population Survey, I estimated the average hourly wage of workers within 5-year age groups, measured as a percentage of the average wage paid to 35-54 year-old workers. The age-earnings profile in 1985-1991 is shown as the solid dark line; the

age-earnings profile in 2004-2010 is shown as the red line. Between ages 25 and 54 there has been little movement in workers' relative earnings. At ages past 55, and especially past 65, however, there has been a noticeable improvement in hourly wages, and the proportional improvement is biggest at more advanced ages. Thus, the upward trend in old-age labor supply has not depressed the relative earnings of older workers. Part of the relative gain in older workers' wages is due to the improvement in the education of older workers compared with younger and prime-age workers. Even accounting for these gains in educational attainment, older workers are earning higher wages compared with prime-age workers than was the case a quarter century ago.

Predicted trends in the future retirement age

The Social Security Trustees predict that the trend toward later retirement will continue in the future. In deriving our estimates of the effect of a higher average age of workforce exit, we use the Social Security labor force predictions as our baseline. Delayed retirement is already baked into its predictions of future Social Security and Medicare costs and revenues. In our project we wanted to learn the effects of an even faster rise in old-age labor supply than is predicted by the Social Security Administration.

To make our predictions, we start with the notion of "labor force persistence" among older workers. Let us assume 1,000 people are in the labor force when they are at a given pre-retirement age, say, age 57. What percentage of those people will still be in the workforce when their birth cohort attains age 62? 63? 65? 70? 74? Chart 8 shows "labor force persistence" among the generation of men who were in the labor force at age 57 and who attained age 60 in 1975. (It is the heavy blue line in the chart.) Almost 70 percent of the men in this age cohort were still in the workforce at age 62; 32 percent of them were still in the workforce at age 66; and 14 percent were still in the workforce at age 74. Chart 8 shows estimates of "labor force persistence" for men who reached 60 in 1975, 1985, 1995, and 2005. Clearly, "persistence" is increasing, especially at ages past 65. I also estimated "persistence" rates for women, and they follow virtually identical trends.

Chart 9 shows how much labor force persistence has increased at each year of age between 60 and 79. The chart compares persistence rates in 1988-1990 and in 2008-2010. The increases are sizeable at every age from 62 onwards. In devising a "higher retirement age" scenario, we assumed that labor force persistence will increase at each age between 60 and 79 at the same rate over the next 30 years as it has over the period from 1988-2010. We left the Social Security Administration predictions of participation rates among younger age groups unchanged.

Chart 10 shows the implications of our assumption for the labor force participation rate of men between 65 and 69. The blue diamonds before 2010 show BLS estimates of the actual participation rates of men aged 65-69. The blue diamonds after 2010 show SSA's 2011-2040 predictions of participation rate for the same male age group. The broken red line shows the implication of assuming that labor force persistence will continue to increase as fast over the

next 30 years as it has over the past 22. By 2040, our alternative scenario shows the participation rate in 2040 is 52 percent. Under the SSA intermediate forecast, the participation rate is a bit less than 40 percent. Chart 11 shows the same numbers for women between ages 65 and 69. SSA's intermediate prediction suggests the participation rate of these women will be 30 percent in 2040. Under our alternative scenario, the participation rate will be a bit less than 40 percent.

Another way to display the projected change in old-age labor supply is to calculate the "average retirement age" projected for men under the SSA forecast and under our alternative forecast of a faster trend toward later retirement. Chart 12 shows the two sets of forecasts along with a tabulation of the historical trend of average male retirement ages between 1968 and 2010. The SSA projection implies that the average retirement age will rise very slowly between 2011 and 2045. In 2045 the average retirement age will be 65. In contrast, our alternative projection implies that by 2045 the average male retirement age will be 69, four years later than projected by the Social Security Administration and three years later than the actual retirement age in 1968.

The implications for the size of the potential workforce past age 55 are displayed in Chart 13. Interestingly, the workforce increases by roughly equal percentage amounts for both men and women. In both cases the number of labor force participants age 55 and older is about 13 percent greater in 2040 under our "delayed retirement" scenario compared with the projections of the Social Security Administration. The timing of the labor force increase compared with SSA's intermediate forecast differs slightly for the two sexes.

We do not claim this represents the best prediction of future labor force growth among Americans 55 and older. In fact, some of the increase in old-age labor force participation rates has been driven by improvements in the educational attainment of 60-74 year-olds compared with younger Americans. The increase in educational attainment of older Americans will slow in the future, possibly leading to a slowdown in future increases in old-age labor force participation. Our alternative scenario does, however, generate a significantly faster increase in old-age participation rates than is predicted by SSA. For that reason we think it provides a useful benchmark for evaluating the effects of later retirement on government revenues and outlays.

How do we decide who will join the workforce? Our projections rely on the Urban Institute's DYNASIM3 simulation model. DYNASIM starts with a sample of over 100,000 individuals drawn from the 1990-1993 panels of SIPP. It then ages this sample in yearly increments from 1993 to 2085, using behavioral relationships estimated in a number of different longitudinal data files. The model integrates many important trends and life course behaviors, including birth, schooling, leaving home, first marriage, remarriage, divorce, disability, work, retirement, benefit take-up, and death. It predicts the major sources of income and wealth annually from a person's late teenage years until death, including earnings, Social Security, benefits from employer-sponsored pensions, Supplemental Security Income and other means-tested benefits, home equity, retirement account accumulations, and other saving and debt.

DYNASIM's employment, earnings, and inflation projections are aligned to the 2011 Social Security trustees' intermediate-cost projections.

My Urban Institute colleagues and I estimated the desired change in labor force status that would occur under our "later retirement" scenario within each individual-year-of-age between 55 and 79, separately for men and women. Remember that the DYNASIM model is already aligned to the SSA assumptions about future LFPRs and employment rates. So the Urban Institute's task was to predict which 55-79 year-olds would change their labor force and employment status as a result of our alternative forecast of a faster increase in old-age participation rates.

What about unemployment? Just because an older person wants a job does not mean he or she will find one. The national unemployment rate in 2012 averaged 8.1 percent. It is implausible to expect a 64-year-old who changes her mind about joining the workforce will immediately find a job. We asked Moodys.COM, a macro-forecasting firm, to help us develop estimates of the proportion of new job seekers who would actually become employed. Chart 14 shows our preliminary forecast of increased employment (the blue line with diamonds) based on our projection of a faster increase in the retirement age. It also shows (the red line with circles) Moodys' estimates of the number of extra workers who would find jobs, assuming we experience the predicted increase in desired labor force participation among workers past 60. We assume that the actual increase in employment is demand constrained until the economy returns to full employment. Moodys predicts, as did the CBO last year, that this magic moment will occur around 2018. After that year, the percentage increases in desired labor force participation and in employment are very close.

Clearly, not every old person who enters or re-enters the labor market under our delayed retirement scenario will get a job. Which ones will not get a job? The Urban Institute's DYNASIM model essentially used random selection to decide. The Moody's model tells us how many people can obtain employment in a demand constrained economy. Among marginal labor force participants, the DYNASIM model allocates the additional jobs randomly across the people looking for a job who were not initially in the workforce.

We used three procedures to allocate the "job shortage" across job seekers. The simplest assumption is that nearly all the new entrants obtain jobs. That is not very realistic when the nation is a long way from full employment, as was the case in 2011-2013. In our second procedure, we assumed that *all* the additional unemployment resulting from higher old-age participation rates would be experienced by the new job-seeking older workers. In our final scenario, we assumed that some of the extra unemployment would spill over into younger age groups.

What is the predicted impact of higher old-age participation rates on the federal deficit? Chart 15 shows the year-by-year predictions from DYNASIM under three different assumptions

about the macro-level response to the availability of additional older workers. “Alt 1” assumes that nearly all of the additional older job seekers obtain employment. “Alt 2” assumes that only as many job seekers obtain employment as is possible in a demand constrained high-unemployment economy. Under this scenario, all of the extra unemployment is suffered by older job seekers. “Alt 3” assumes the extra unemployment resulting from an influx of elderly job seekers is distributed across both young and old job seekers.

These estimates take into account the extra payroll tax revenue generated by higher earnings, the extra income taxes generated by higher earnings and – eventually – higher private pensions, higher investment income as a result of added savings, and bigger withdrawals out of tax-preferred savings accounts. The estimates include the higher Medicare premiums some recipients will pay either because their retirement income is topped up with earnings or is higher because they receive bigger pension and Social Security payments. The deficit estimates also account for savings because some Social Security and Medicare benefits are deferred or reduced.

There is a less obvious impact of later retirements on future Social Security outlays. The additional workers will typically lower the average annual wage earned by wage earners. Why? Because the extra workers are mostly old, hence on the margin will earn below-average wages. Many will have earnings for only part of a year. The slight reduction in the economy-wide average wage will in turn reduce the Social Security benefits of most future retirees, because of the impact on the bend points in Social Security’s pension benefit formula. These are the kinds of effects we can uncover in a meticulous and accurately written simulation program that are missed in most discussions of policy.

Chart 15 clearly shows that, as the employment gains from later retirement become more pronounced, the percentage reduction in the federal deficit grows. After about 2018 there is very little difference between any of the three forecasts, which is not surprising because after 2018 employment is no longer demand constrained. By 2025 later retirement reduces the deficit by 15 percent compared with CBO’s “current law” baseline forecast. By 2040 the deficit is reduced by almost 40 percent.

These seem like sizeable deficit reductions, at least in proportional terms. Unfortunately, CBO’s 2012 “current law” forecast was not very realistic. It assumed taxes will go up and defense and domestic spending will be constrained according to the law that was in effect in late 2012. Those assumptions might have turned out to be true, but that was not considered likely. Chart 16 shows the DYNASIM estimates under CBO’s more realistic “alternative” deficit projections. These projections assume that many of the tax increases and spending constraints written into law in late 2012 would not go into effect because their consequences would have been politically unpalatable. If CBO’s “alternative” deficit projections were correct, our delayed retirement scenario would do little to restrain the growth of the deficit. We estimated the deficit would be smaller by 3 percent to 3½ percent in 2020. Thereafter, the proportional effect would have been even smaller.

The plain fact is that under the “current law” CBO baseline projections the nation does not face a long-term budget problem. Later retirement would whittle down the deficit by an impressive percentage amount, but there is not really any problem to solve. Under the “current law” scenario, the government’s debt measured as a percent of GDP falls almost continuously until the end of the forecast period. Chart 17 shows what a small difference later retirement makes to the deficit when we substitute a more plausible prediction of the future deficit (CBO’s “Alternative” forecast) for the “Current Law” forecast. The CBO has subsequently modified both its “current law” and “current policy” budget projections. The current projections as of October 2013 are somewhat more optimistic than the “current policy” projections offered by the CBO in late 2012, but they are far less optimistic than the “current law” projections offered last year. Thus, using the CBO projections available in late 2013, a trend toward later retirement ages will have a comparatively modest impact in improving the long-term budget outlook.

Other effects of delayed retirement

We can conclude with some more cheerful numbers. The DYNASIM model generates predictions of the income distributional effects of a change in old-age labor force participation rates. The last 3 charts focus on the population between 55-79 years old, which is the one most affected by a delay in retirement. Chart 18 shows percentage changes in the incomes of people in six older age groups. The light blue bars refer to our estimates of income gains in 2020; the red bars indicate percentage income gains in 2030; and the green bars show income gains in the last year of our forecast, 2040. In each case the percentage change in per capita net income is calculated relative to net incomes received under the Social Security Administration’s labor force participation forecasts.

Not surprisingly, the biggest proportional effects on income are for people between 65 and 69, the age range where the biggest changes in labor force participation will occur. Much of the income gain consists of higher labor income. Many people in this age range are still working, and many of them earn enough so that they will not collect a Social Security pension or make withdrawals from a tax-deferred pension account.

The DYNASIM model predicts that the income gains from delayed retirement will be progressive. That is, the predicted gains will increase the incomes of poorer groups proportionately more than better off groups. One way to see this is to show income gains by educational attainment group. Chart 19 divides 55-79 year-olds into three educational attainment groups—high school dropouts, high school graduates, and college graduates. Although people in all three educational attainment groups experience income gains, in each year the proportional gain is biggest for the least educated group.

The same pattern can also be seen when we rank people by their per capita income. Chart 20 divides 55-79 year-olds into five income quintiles. The biggest proportional income gains occur among the aged and near-aged who have the lowest predicted incomes before the hypothetical retirement delay. The reason that later retirement tends to reduce inequality among

the aged and near-aged is that older people with relatively high incomes already work. Hence, the increases in income associated with an added delay in retirement will tend to boost the earnings of people with lower incomes.

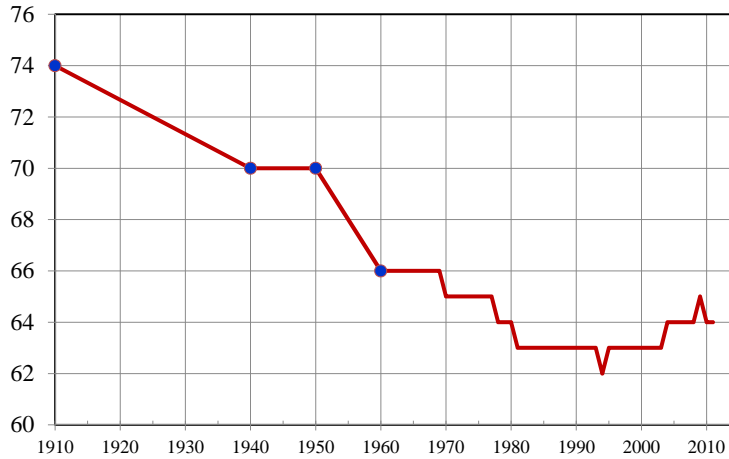
Conclusion

A retirement delay, without any additional change in public policy, will do relatively little to curb our deficit problem—assuming we use a politically realistic estimate of the size of that problem. The reasons are straightforward. Delays in retirement will generate higher payroll and income tax revenues and some near-term reductions in government outlays on Social Security and near- and long-term reductions in net outlays on Medicare. At the same time, however, they will generate higher future Social Security obligations. Additions in lifetime earnings push up Social Security pension entitlements for the workers who delay their retirement. Furthermore, delays in Social Security pension claiming will eventually increase future monthly pension payments as a result of actuarial adjustments for benefit delay. The net impact on the government's budget balance will be large in absolute terms but small in relation to the size of deficit problem under realistic policy assumptions. Therefore, an important implication of our study is that achieving meaningful progress cutting future deficits will require more than a change in retirement behavior on the part of workers who are capable of delaying their labor force exit. If meaningfully large budget savings are to be achieved in the nation's retirement programs, changes in eligibility rules or benefit formulas will be needed.

On the other hand, an increase in the average retirement age would go some way toward improving the incomes and material circumstances of the aged. If the Urban Institute's predictions of who will retire later are accurate, the distributional impact of the income gains will be welcome.

Chart 1. Average retirement age of American men, 1910-2011

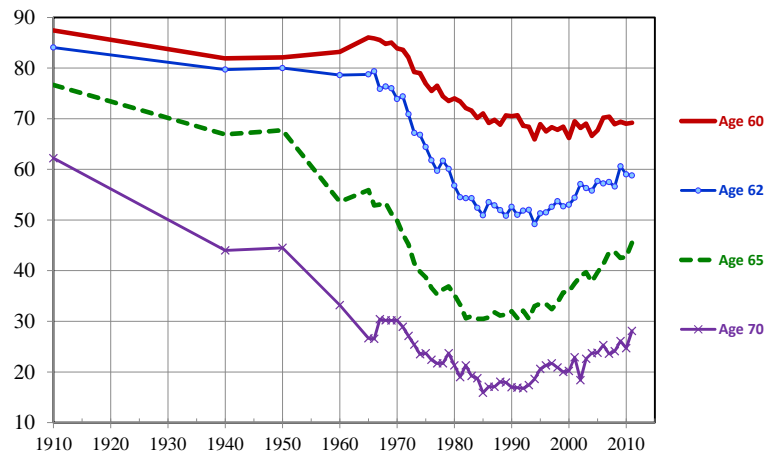
Youngest age at which fewer than 50% of men are in active labor force (in years)



Source: Decennial Census (1910, 1940, 1950, and 1960) and BLS Current Population Survey files (1965-2011).

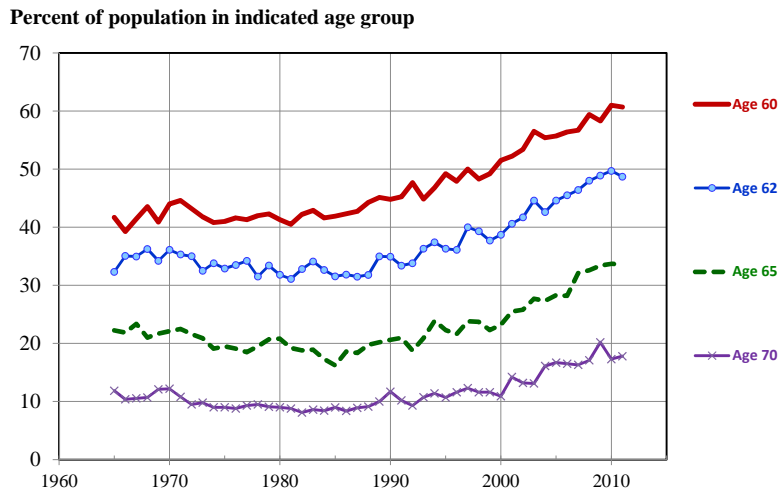
Chart 2. Labor force participation rates of 60- to 70-year-old men, 1910-2011

Percent of population in indicated age group



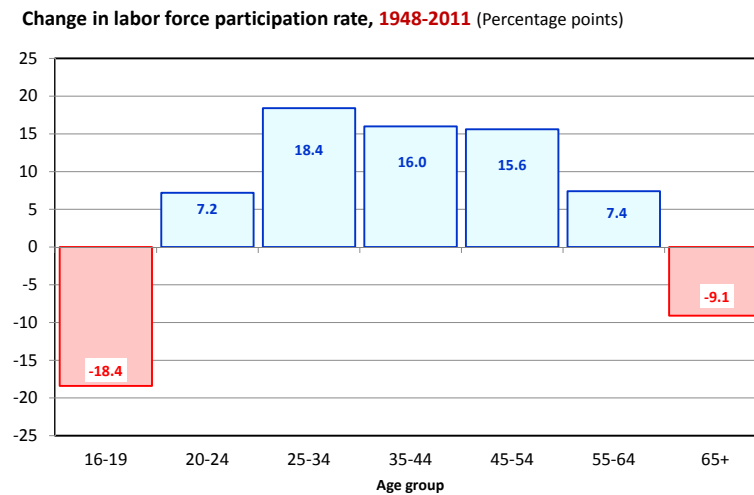
Source: Decennial Census (1910, 1940, 1950, and 1960) and BLS Current Population Survey files (1965-2011).

Chart 3. Labor force participation rates of 60- to 70-year-old women, 1965-2011



Source: BLS Current Population Survey files (1965-2011).

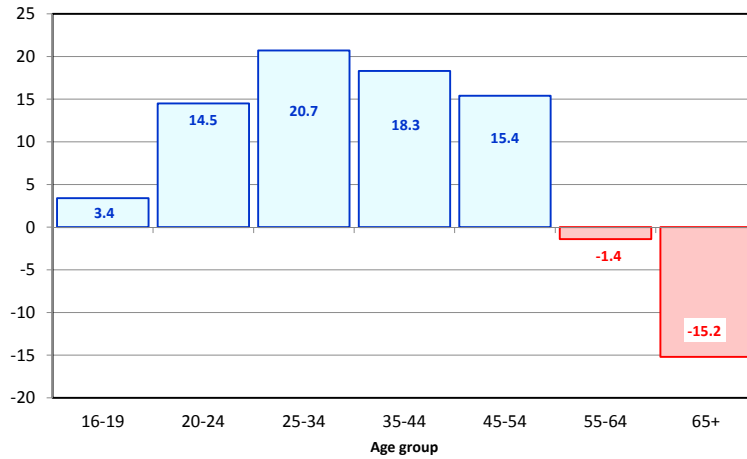
Chart 4. Change in labor force participation rates by age group, both sexes, 1948-2011



Source: BLS Current Population Survey files (1948 and 2011).

Chart 5. Change in labor force participation rates by age group, both sexes, 1948-1989

Change in labor force participation rate, 1948-1989 (Percentage points)

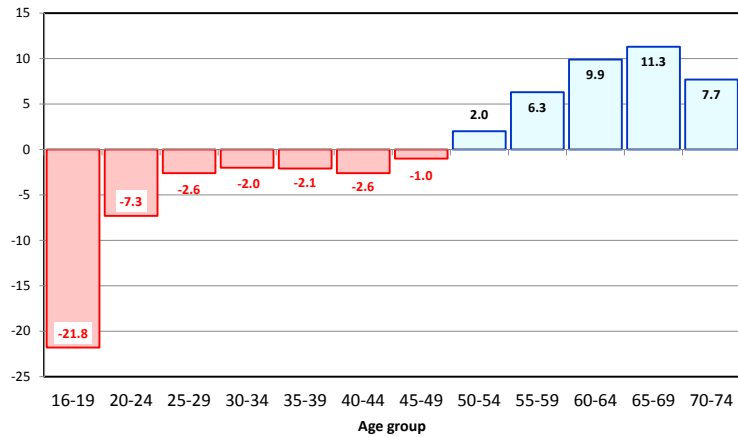


Source: BLS Current Population Survey files (1948 and 1989).

Chart 6. Change in labor force participation rates by age group, both sexes, 1989-2011

Change in labor force participation rate, 1989-2011

(Percentage points)



Source: BLS Current Population Survey files (1989 and 2011).

Chart 7. Age Profile of Hourly Wages, 1985-1991 and 2004-2010: MEN

Hourly wage of 35-54 year-olds = 100

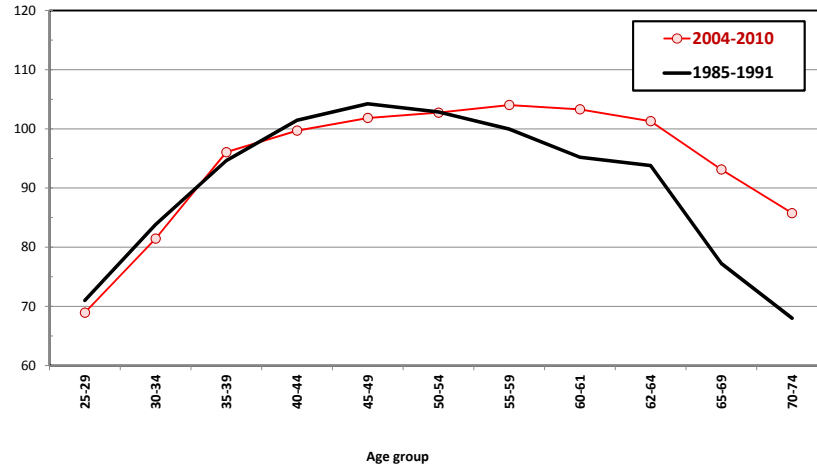
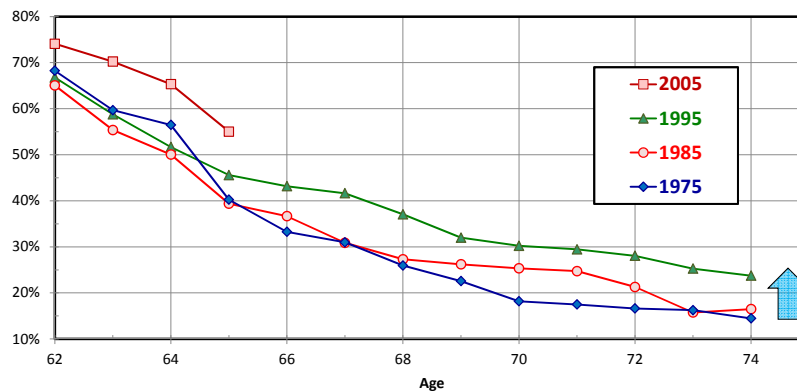


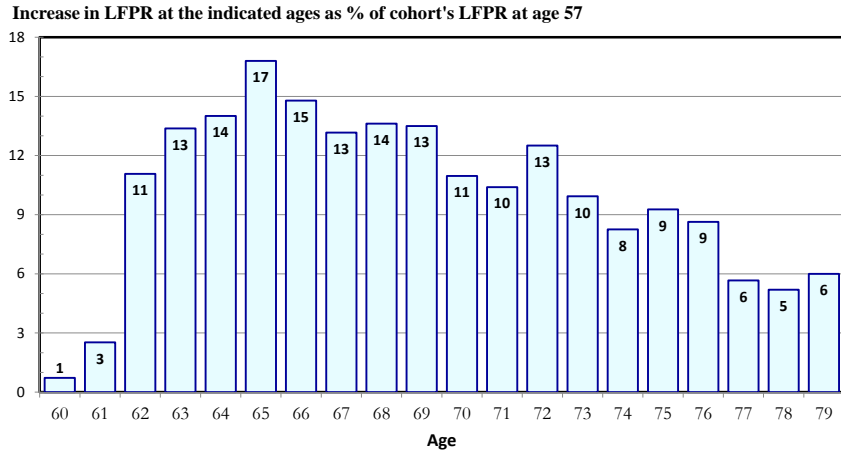
Chart 8. LFPR at Indicated Ages as a % of LFPR of Cohort at Age 57, Selected Birth Cohorts Attaining Age 60 between 1975 and 2005: Males

Labor force “persistence”:
What % of 57-year-old workers are still in LF at indicated ages?



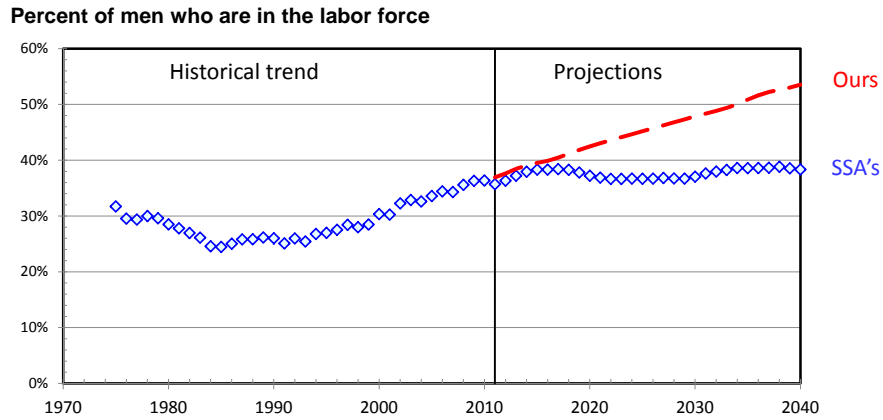
Source: Author's calculations based on Current Population Survey files (1975-2010).

Chart 9. Increase in the LFPR at Indicated Ages as % of Cohort's LFPR at Age 57, 1989 to 2010: MEN



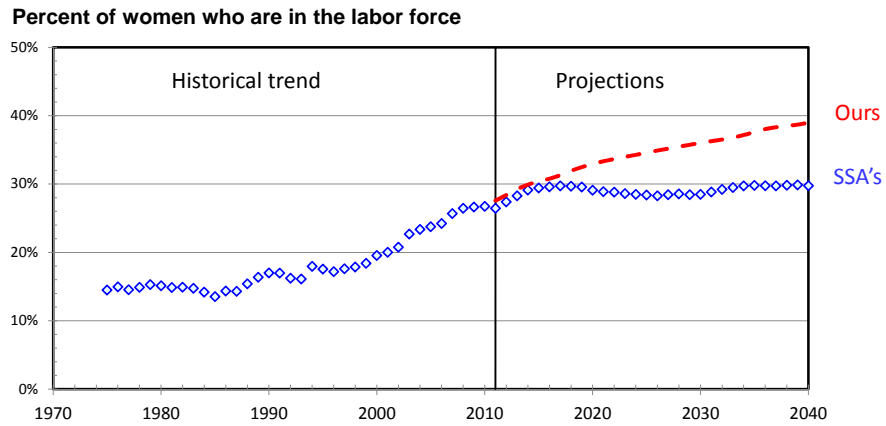
Source: Author's calculations based on Current Population Survey files (1975-2010).

Chart 10. Historical and predicted labor force participation rates, 1975 to 2040: MEN age 65-69



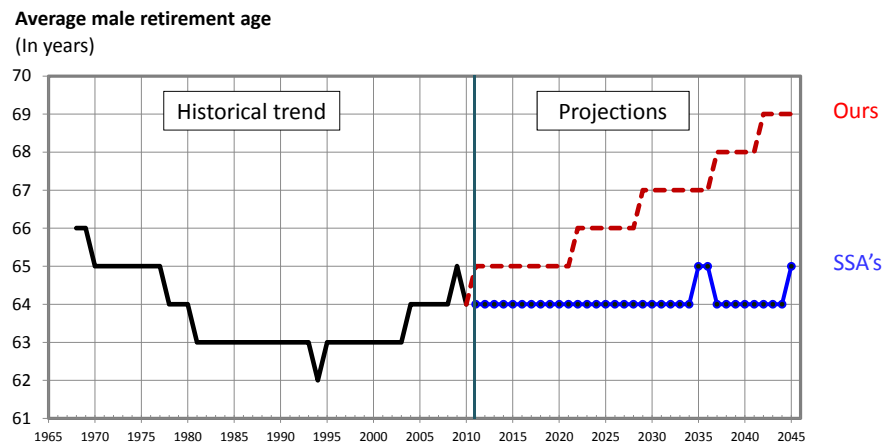
Source: Social Security Trustees' Report (2011) and author's calculations based on CPS files (1975-2010).

Chart 11. Historical and predicted labor force participation rates, 1975 to 2040: **WOMEN age 65-69**



Source: Social Security Trustees' Report (2011) and author's calculations based on CPS files (1975-2010).

Chart 12. Average retirement age of **MEN, 1968-2045**

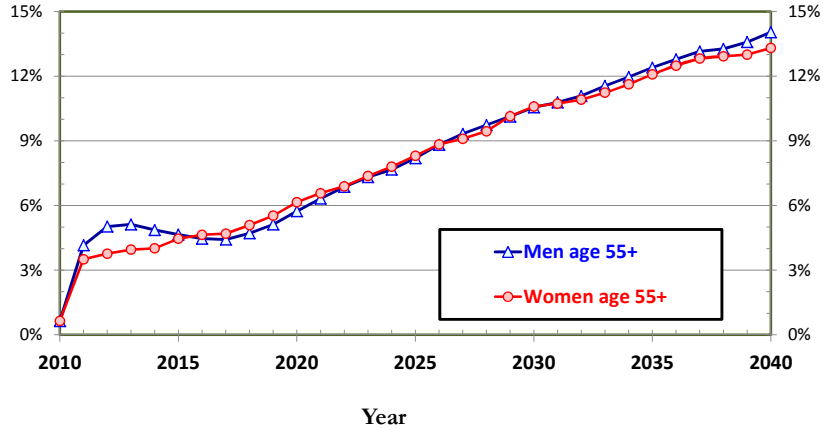


Note: The "average retirement age" is the youngest year of age at which fewer than 50% of males remain in the labor force.

Source: Burtless tabulations of BLS, SSA, and own estimates, October 7, 2013.

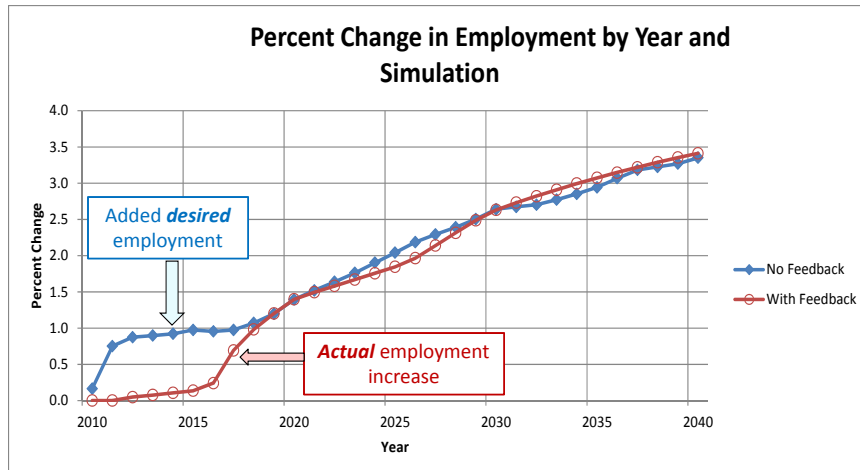
Chart 13. Predicted increase in size of the workforce 55 and older under our alternative scenario, 2010 to 2040

Percent of aged workforce as predicted by the Social Security Trustees (2011 Trustees' Report)



Source: Social Security Trustees' Report (2011) and author's calculations based on CPS files (1975-2010).

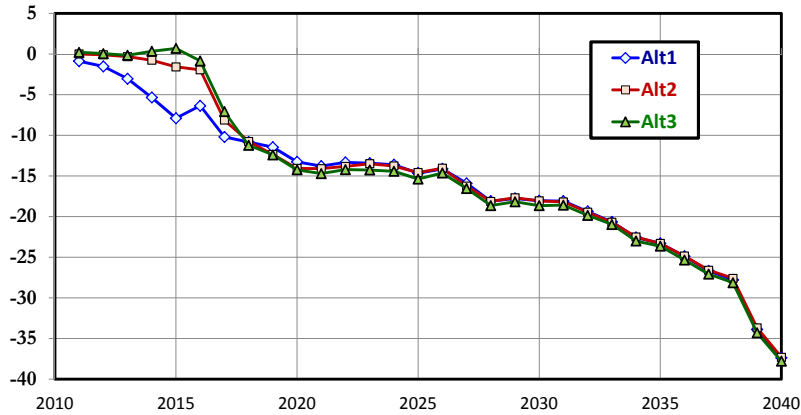
Chart 14. Percent increase in *desired* and *actual* total employment compared with Social Security forecast, 2010-2040



Source: Urban Institute (DYNASIM3) and Moodys.Com calculations.

Chart 15. Impact of later retirement on federal deficit under alternative assumptions, 2011-2040

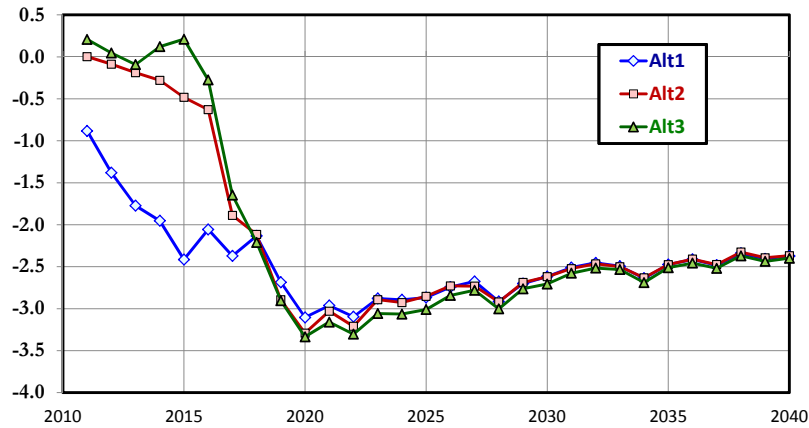
Change in deficit:
Percent of CBO's "Current Law" baseline forecast



Source: Urban Institute (DYNASIM3) and CBO (2012).

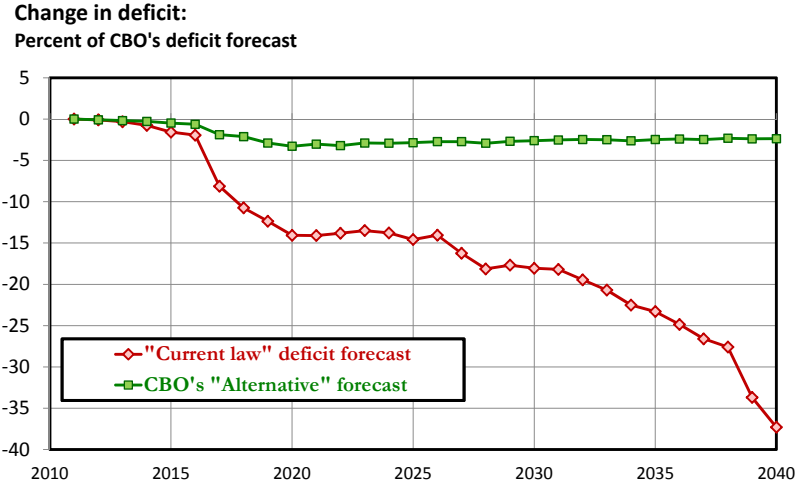
Chart 16. Impact of later retirement on federal deficit under alternative assumptions, 2011-2040

Change in deficit:
Percent of CBO's "Alternative" (i.e., "realistic") forecast



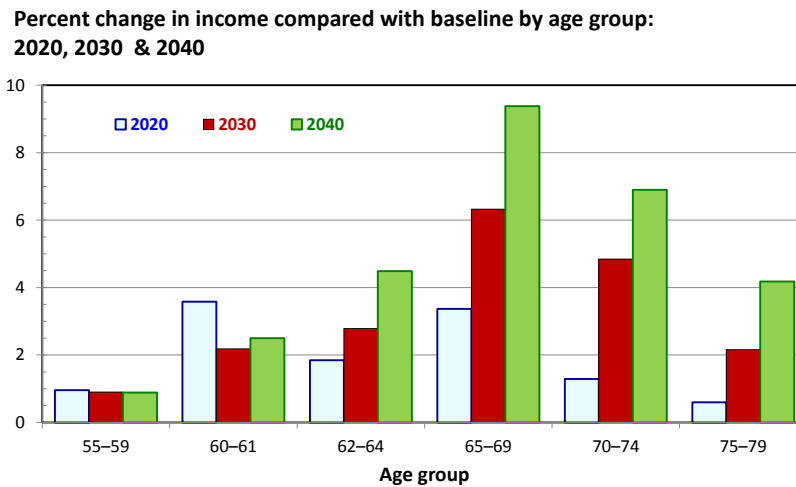
Source: Urban Institute (DYNASIM3) and CBO (2012).

Chart 17. Impact of later retirement on federal deficit under alternative CBO forecasts of the deficit, 2011-2040



Source: Urban Institute (DYNASIM3) "alternative 2" labor supply forecast; CBO (2012).

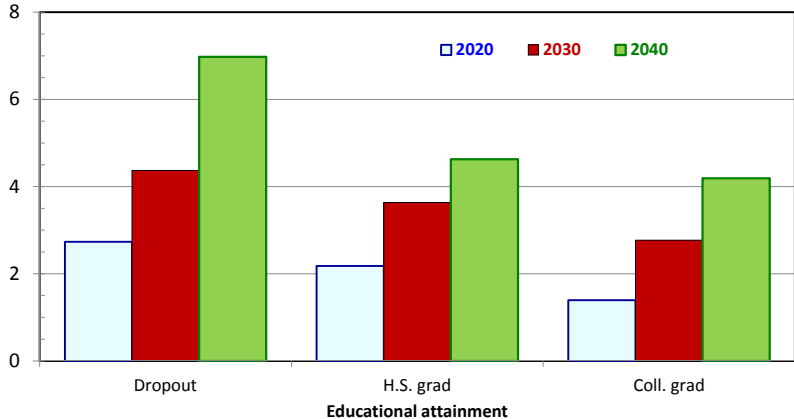
Chart 18. Impact of later retirement on per capita income, by age group, 2020, 2030, and 2040



Source: Urban Institute (DYNASIM3) "alternative 2" labor supply forecast.

Chart 19. Impact of later retirement on per capita income, by educational attainment, 2020, 2030, and 2040

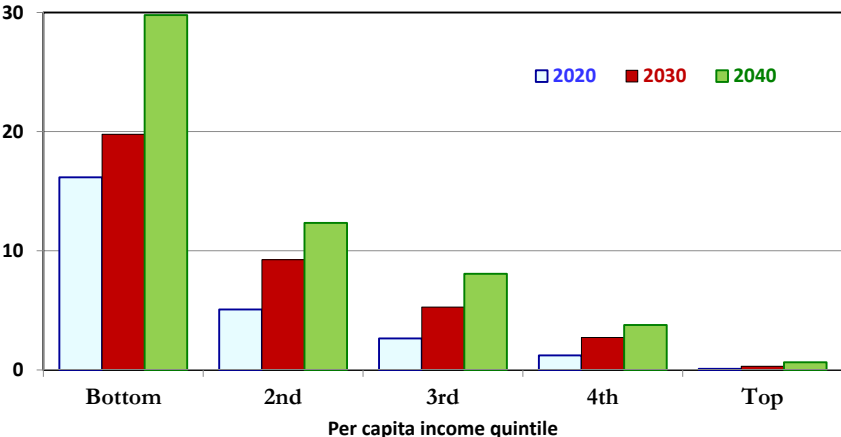
Percent change in income compared with baseline by educational attainment: 2020, 2030 & 2040



Source: Urban Institute (DYNASIM3) "alternative 2" labor supply forecast. Estimates for the population age 55–79.

Chart 20. Impact of later retirement on per capita income, by income quintile, 2020, 2030, and 2040

Percent change in income compared with baseline by income quintile: 2020, 2030 & 2040



Source: Urban Institute (DYNASIM3) "alternative 2" labor supply forecast. Estimates for the population age 55–79.