The Effect of Population Aging on Aggregate Labor Supply in the United States

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I. Introduction

Output growth is determined by growth in labor productivity and growth in labor input. Over the past two decades, technological developments have changed how many economists think about growth in labor productivity. However, in the coming decades, the aging of the population will change how economists think about the growth in labor input in the United States. As the oldest baby boomers born in 1946 turned 50, then 55, and then 60, an important economic change has slowly surfaced: these people have become less likely to participate in the labor force. While this shift was obscured by a labor market slump in 2002, the aging of the American population began to put downward pressure on aggregate labor supply, marking the start of what is likely to be a sharp deceleration in labor input that will last another half-century.

Beginning in the mid-1960s, movements in women's labor force participation dominated all other influences, pushing up aggregate labor force participation rates sharply over the 25 years since 1965, until leveling off after about 1990. From 1963 to 1991, the average annual growth in the U.S. labor force was 2 percent a year. In coming years, the dominant influence will likely be the evolution of the population's age distribution. The Social Security Administration projects labor force growth will slow to 0.5 percent a year by 2015 and to 0.3 percent a year by 2025[1]—a striking deceleration from the aforementioned 2 percent annual pace. Since 1995 the population bulge then comprising people in their 30s has moved on to older age groups that are associated with lower labor force participation rates. Barring an enormous change in the participation behavior

of older Americans, the shift of the population distribution away from prime working-age adults will put significant downward pressure on the nation's labor force participation rate. In fact, absent other changes, the aging of the U.S. population has the potential to undo the increases in participation rates brought about earlier by the increased entry of women into the labor force.

Estimates of labor supply growth also depend partly on uncertain population projections. Both the U.S. Census Bureau (Census Bureau) and the Social Security Administration project that growth in the population aged 16 years and over will slow to about 1 percent in 2009, from the 2005 pace of approximately 1.2 percent. However, there are subtle differences in these two projections that, combined with differing participation rate projections, act to widen the differences between various projections for aggregate labor supply growth.

As the changes in the U.S. age distribution and population growth unfold, it is unclear how the within-group trends will adapt to offset—or perhaps evolve to exacerbate—the declines induced by the aging of the population. In the last five years, in fact, within-group trends appear to have mostly exacerbated the decline in labor force participation.[2] Even abstracting from how within-group participation rates have evolved in recent years, the shifts in the age distribution have lowered the labor force participation rate by nearly 0.4 percentage points between 2002:Q4 and 2006:Q4.[3] Going forward, however, the within-group changes in participation rates are the crucial element in determining the extent to which U.S. population aging may depress aggregate labor force participation.

A population-weighted average of individual age group participation rates indicates that aging has lowered aggregate U.S. labor force participation during the 2002–2006 period. However, the level of the labor force rose 1.8 percent between December 2005 and December 2006, as the participation rate moved up from 66.0 percent to 66.4 percent. Yet in 2007:Q2, the labor force participation rate fell back to an average of 66.0 percent. Where labor supply is headed has, accordingly, become the subject of some debate. The question has spawned a small literature seeking to separate trend developments from cyclical responses, and to understand what the future course of labor supply might be.[4]

A number of uncertainties currently cloud this debate. For example, when discussing a paper on labor supply presented by the current authors and others at a recent Brookings Institution panel, members of the panel suggested that participation rate projections might be highly sensitive to assumptions about the future course of immigration, and that government projections often do not include illegal immigrants in population estimates. As will be explained in more detail below, this assertion is not quite correct, and immigration has more influence on population growth and measures such as the dependency ratio than does the labor force participation rate.

To try to answer some of these questions, this paper seeks to document a number of the features of various labor force projections made by different federal agencies, and to evaluate the importance of various assumptions to those projections in order to focus subsequent research on where the most important uncertainties lie.

The paper proceeds as follows: Section II describes the shifts underway in the nation's age distribution, and how this change relates directly to the labor force participation rate. The influence of two key assumptions underlying U.S. population projections, life expectancy and immigration, is discussed in section III. Section IV discusses within-age-sex-group trends from the Bureau of Labor Statistics, the Social Security Administration, and the predictions of a cohort-based model of participation developed by the authors. This model identifies birth cohorts' propensities to participate in the labor force, and explicitly incorporates the changing population shares.[5] Section V cautions that we do not yet know how policy may ultimately respond to the coming changes, and section VI summarizes our main points.

II. How Population Shifts Influence Labor Force Participation

The reason that U.S. population aging has the potential to drastically slow labor supply growth is because labor force participation rates decline precipitously after age 50 for both men and women. Thus as the aging baby boomers move into their 60s, and as life expectancies continue to lengthen, the rising population share of older Americans has the potential to lower the share of Americans who are working or looking for work. For example, by 2035 the share of the adult population aged 80 years or more is expected to double to approximately 15 percent, and 97 percent of this age group currently does not participate in the labor force. The

future downward pressure on participation rates is primarily a result of these two forces—the aging of the baby boomers and longer life expectancies—now pushing in the same direction, after many years in which the upward pressure of the baby boomers moving into high participation rate ages offset the downward pressure from longer life expectancies on labor supply.

Figure 2.1 shows the age profiles of U.S. labor force participation rates for men and women using 2005 annual averages for 14 age categories, and the aggregate participation rate for reference.[6] Among women, those over 55 years of age have below-average labor force participation rates. Among men, the age groups over 60 years of age have below-average labor force participation rates. Historically the age profile for men has remained relatively stable, although among women, in particular those above 20 years of age, participation rates have risen during the postwar period. These various age profiles capture an important feature of labor supply—although within-age participation rates among older age groups

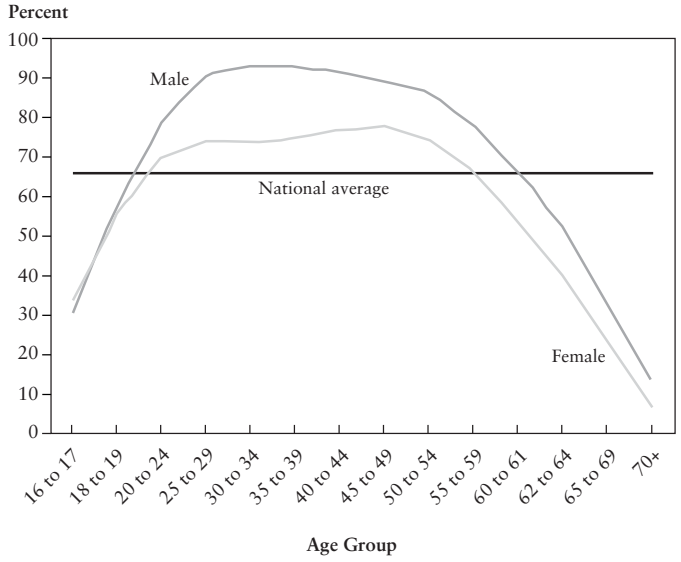

Figure 2.1
U.S. Labor Force Participation Rates by Age, 2005 (Annual Averages)
Source: U.S. Bureau of Labor Statistics.

may rise and fall, individuals in their 60s are much less likely to participate in the workforce than individuals in their 50s, and individuals in their 70s are much less likely to participate than individuals in their 60s.

In short, after age 50, labor supply is a declining function of age. Whether this lower supply arises due to failing health, disability, having adequate wealth, or retirement income, it is a feature of life-cycle labor supply unlikely to change fundamentally in the next few decades. While the first derivative of this function may change, it is quite likely to remain negative.

Figure 2.2 shows some historical and projected population shares of the age 16 and over Civilian Non-Institutional Population (CNIP), taken from the Current Population Survey, and grown out by the Census Bureau's population projections. The combination of rising life expectancy and the aging of the baby boom generation is dramatically pushing up the population share of older Americans. Around 2002, the share of individuals aged 55 years and older began to grow, while at the same time the share aged 35–44 years was shrinking. In 2006, the share of the age groups over 65 years old has begun to rise, and this increase will accelerate around 2010, with the share growing until around 2030.

Figure 2.2 highlights the fact that that the baby boomers are a bulge generation. As they leave high participation rate age groups, the cohorts behind the boomers are relatively small. In 1946 the U.S. fertility rate—defined as the number of live births per 1,000 women aged 15–44 years—leapt by nearly 20 percent, an unprecedented jump. The fertility rate rose another 10 percent in 1947. However, after peaking in 1957, fertility declined steadily and by 1966 had fallen back to levels seen during World War II. By 1973 the fertility rate had fallen to a level that at the time was the lowest recorded by the official U.S. statistics begun in 1909. The result of this fertility decline is that while the baby boomers grow older, the U.S. population in the highest labor force participation rate age groups is falling. In fact, the level of the CNIP of 30-34-year-old men, the highest participating age-sex group, has had outright declines since 2003, according to the Bureau of Labor Statistics.

The implications of these demographic shifts for future labor force participation are striking. Figure 2.3 shows the history of the actual labor force participation rate through 2006, along with a projection through

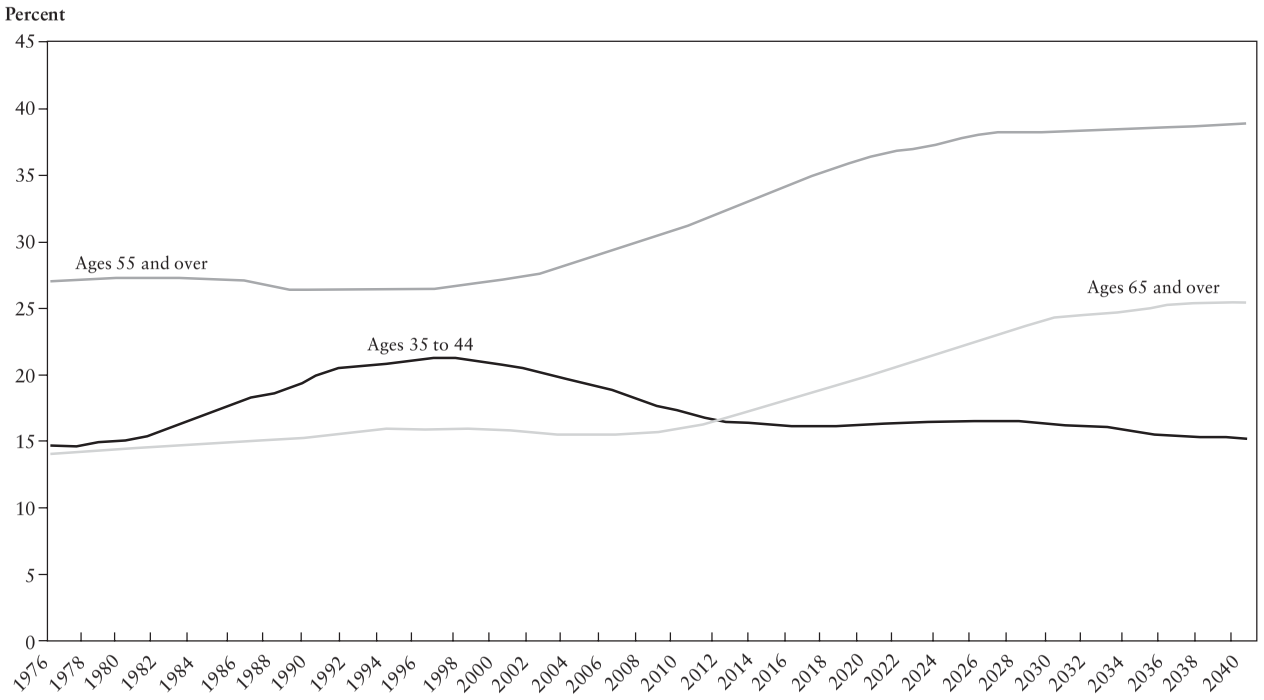

Figure 2.2
U.S. Population Shares by Age Group, 1976–2040: Actual and Projected
Source: Current Population Survey and U.S. Census Bureau.

Figure 2.3
U.S. Labor Force Participation Rates, 1950–2040: Actual and Projected
Source: U.S. Bureau of Labor Statistics and U.S. Census Bureau.
Note: Projection uses actual 2005 annual labor force participation averages within age groups, weighted by projected population shares.

2040 that uses the 2005 labor force participation rate for each age group and allows the population shares to evolve as forecast by the Census projections. Although other starting years can produce mildly different patterns, the implications are essentially the same: absent other changes, projected U.S. population aging will lower the aggregate labor force participation rate by 6 full percentage points over the next 35 years. This pace of decline dwarfs the 0.4 percentage point decline in aggregate labor force participation that shifting population shares have engendered over the past four years. In addition, using 2005 as a base year incorporates recent increases in older Americans' participation rates; the influence of aging would be a bit larger say, if we used year 2000 participation rates. In sum, the projected aging of the labor force is likely to have a sizeable influence on participation rates, with the potential to completely unwind the increases in participation attributable to the entry of more women in the workforce that began in the mid-1960s, accelerated sharply until 1990, and has since then leveled off.

The extent to which this decline shall materialize will depend on two inputs to the calculation: the projection for population shares, and the projections for within-age-group participation rates. We discuss each of these in turn.

III. Population Projections

Two government agencies are primarily responsible for U.S. population projections, and the projections' underlying assumptions overlap substantially. The primary agency is the Census Bureau, but the Social Security Administration produces independent estimates of population levels and growth. The primary difference between the two agencies' population projections is due to assumptions about net international migration, including undocumented immigration. However, in recent years important differences have arisen in the agencies' estimates for the population share of Americans over age 65.

The U.S. Census Bureau, of course, conducts the decennial census. In between these official censuses, which are essentially a benchmark, the agency produces estimates that update how many people are living in the United States, based on a variety of sources ranging from the National Center for Health Statistics to the Department of Defense; these updates

incorporate estimates from surveys such as the American Community Survey. The Census Bureau's updated estimates appear in the published reports from the Current Population Survey. Despite the Census Bureau's best efforts, these estimates can be off substantially. For example, the estimate of the national population from the 2000 decennial census was 6.8 million individuals more than the pre-decennial census estimates. Of that gap's discrepancy, 4 million was due to improved methodological reductions in undercounting, which would have raised pre-census estimates had the method been applied to the 1990 census. Only 2.8 million of the discrepancy was due to underestimated population growth, disproportionately Hispanic, which appears attributable to underestimating net international migration.[7]

While the Census Bureau's estimates are backward looking, and provide the nation's best estimate of the population at any given point in history, it also produces forward-looking projections. Based on the size of cohorts, assumptions for fertility rates, estimated death rates, and assumptions for net international migration, levels of the population at each age are projected out to 2050.[8] Similarly, the Social Security Administration produces its own projections, while using the Census Bureau's historical estimates.

However, the two agencies' assumptions have different implications for how the U.S. population is distributed across various age groups, and thus each agency's projection implies a different degree of downward pressure on the aggregate labor force participation rate. Although both the popular media and labor researchers tend to focus on how immigration may affect the future labor supply, the key difference for the U.S. labor supply outlook is the varying projections for longevity—in particular the life expectancy of older American women. Figure 2.4 shows the population shares of several age groups of men and women in the Current Population Survey estimates and in the Social Security Administration projections for 2005. The most notable difference is that the Social Security Administration predicted a lower share of women over age 65 than did the Census estimates, although the Census estimates were based on more recent source data.[9]

Figure 2.5 compares the implications of this difference for projections of the labor force participation rate. For this exercise we use the published Bureau of Labor Statistics' participation rates within age groups, so the

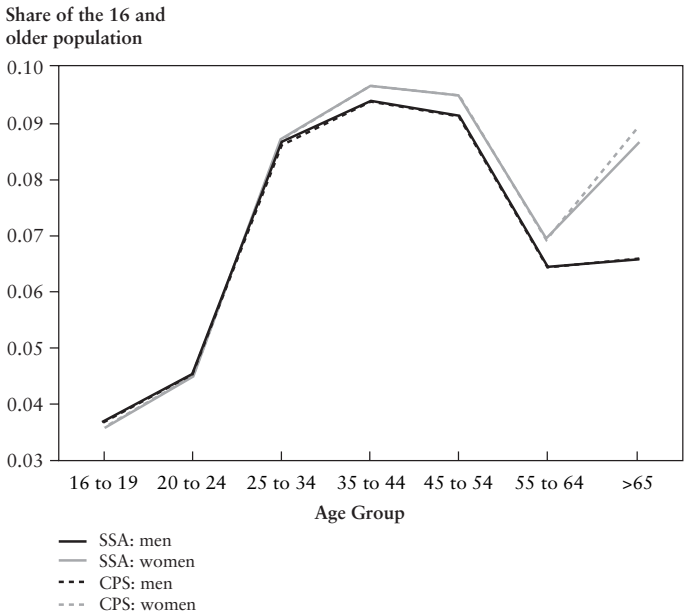

Figure 2.4
U.S. Population Distributions by Age, 2005: U.S. Census Bureau's Current Population Survey versus U.S. Social Security Administration Estimates
Source: Current Population Survey (U.S. Census Bureau) and U.S. Social Security Administration.

differences in the aggregate participation rates derive solely from differences in population shares. The solid line uses the current Census Bureau estimates of population shares in 2005 grown out by census projections for population shares going forward, while the dashed line uses the Social Security Administration's projections for the population shares. The pace of decline in the two projections is quite similar, which is not surprising, as both agencies rely mostly on current death tables for projecting future life expectancy and the immigration assumptions are relatively similar. An important part of the level gap reflects the Social Security Administration projections' smaller assumed labor market share of women over age 65, a group which has a particularly low participation rate, and the extrapolation of this difference.

This comparative exercise points to a particular downside risk to labor force participation rate projections. To the extent that most estimates

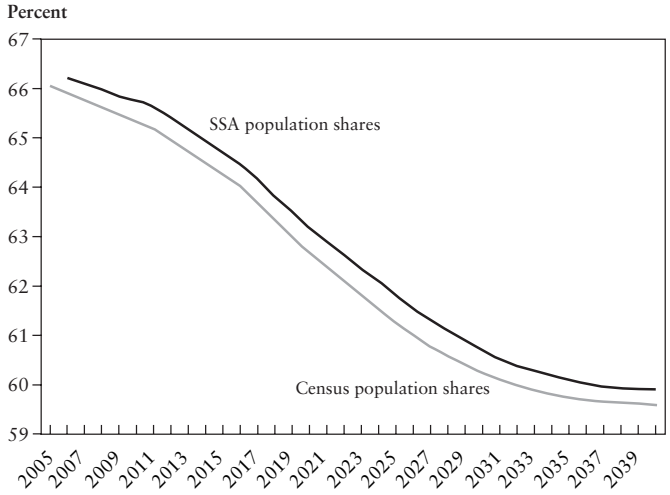

Figure 2.5
Projected U.S. Labor Force Participation Rates, 2005–2040: Census Bureau Population Shares versus Social Security Administration Estimates
Source: U.S. Bureau of Labor Statistics, U.S. Census Bureau, and U.S. Social Security Administration.
Note: Participation rates are calculated using published U.S. Bureau of Labor Statistics rates and alternative population projections.

of future life expectancy are based on current death rates, little adjustment is made for continued reductions in mortality rates.[10] To provide a sense of the magnitude of this risk, we adjusted the population growth of females aged 70 years and over from what is actually predicted by the Census Bureau projections. The change we made was to essentially simulate a shock to mortality rates for this age group. Deaths per person per year among all Americans age 65 years and over declined from nearly 0.1 in the years prior to World War II, down to nearly 0.05 by 2000.[11] For our counterfactual simulation we lower the projected path of deaths per person in the Census Bureau projections for females age 70 years and over by 0.01 in 2006 and every year thereafter. Note that by adjusting the rate of exit from the population, the population growth rate is boosted every year, which has a cumulative effect over time because the lower outflows raise the number of women aged 70 years and over who survive from year to year. The result of this counterfactual simulation is shown in Figure 2.6. In this scenario, by 2040 the downward pressure on

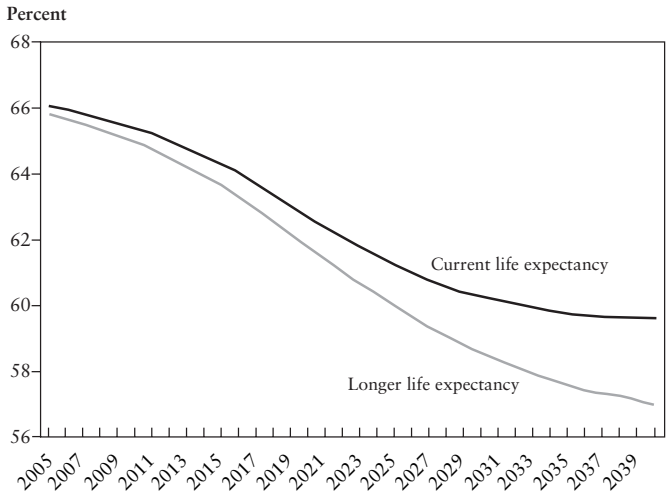

Figure 2.6
The Impact of Reduced Female Mortality Rates on Projected U.S. Labor Force Participation Rates, 2005–2040
Source: U.S. Bureau of Labor Statistics and U.S. Census Bureau.

the aggregate participation rate would be an additional 2.5 percentage points.

While continued reductions in mortality pose a downside risk to projections of the aggregate labor force participation rate, increases in immigration would likely pose an upside risk because immigrants are more likely to be in younger age groups with higher labor force participation rates, and are arguably more likely to participate even within older age groups (see Figure 2.7 for an example of the variation in participation across racial/ethnic groups).[12]

Much of the issue with immigration is one of measurement. For example, based largely on discrepancies between employment estimates from the Current Population Survey and the Current Employment Statistics program, many analysts argued that the Census Bureau has overestimated population growth, and in particular has overestimated net international migration since the 2000 census. If, indeed, the Census Bureau has overestimated net international migration, that may imply that the current level of the aggregate participation rate is overstated. And if the Census

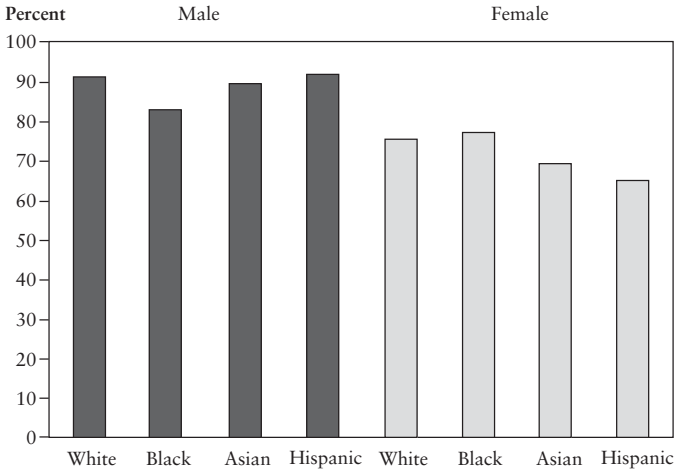

Figure 2.7
2005 U.S. Labor Force Participation Rate, Ages 25 to 54 Years, by Race and Gender
Source: U.S. Bureau of Labor Statistics.

Bureau projections for population growth also overestimate future net international migration, this may represent a downside risk to the projections for the U.S. aggregate labor force participation rate.

Undocumented immigration is the most difficult component of net international migration to measure. Accordingly, estimates of the number of undocumented immigrants vary widely, but the most recent estimates from the Pew Hispanic Center put the number of undocumented immigrants in the United States in 2006 at about 12 million—a figure consistent with the estimates in the Current Population Survey.[13] Of those 12 million undocumented immigrants, 49 percent are estimated to be male, 35 percent female, and 16 percent children. As to the total inflow of documented and undocumented immigrants, the Census Bureau estimated that total net immigration in 2005 was 1.2 million. The Social Security Administration, in its intermediate assumptions, assumes total net immigration in 2005 of 1.075 million. The Social Security Administration projects that total net immigration will decrease to 1 million annually by 2010 and to 900,000 annually by 2030. Alternatively, the Census Bureau projects total net immigration of 770,000 for 2010, and 1,161,000 for

2030, both of which are upward revisions from earlier assumptions after taking on board the data from the 2000 decennial census.

Of course, what will actually happen to U.S. net immigration 20 years from now is anyone's guess. However, compared to the influence of the aging of the population, immigration will have little influence on the aggregate added "immigrants" to the male 30-34-year-old age group—the age group with the highest labor force participation rate.[14] First, we added 100,000 of these high-participation persons each year from 2000 onward. This is represented as assumption (1) in Figure 2.8. Second, we added 200,000 per year, for an extra million (compared with an estimated stock of about 12 million) by 2006.[15] This is assumption (2) in figure 2.8. This alternative would be roughly similar to the high series nonlegal immigration assumption by the Social Security Administration, but represents a 50 percent increase over their intermediate assumption. Of course, the Social Security Administration would not likely assume that all those added immigrants would be 30-34-year-old men. In addition, we assume that even as they age, these male immigrants will maintain the

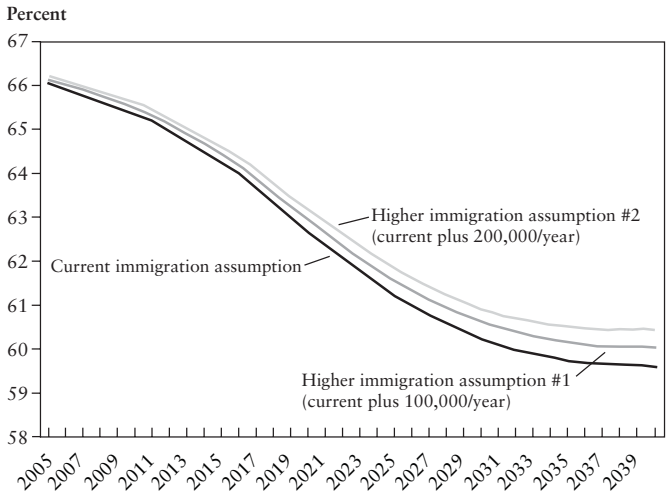

Figure 2.8
The Effect of Immigration Assumptions on Projected U.S. Labor Force Participation Rates, 2005–2040
Source: U.S. Bureau of Labor Statistics.

participation rates of current 30-34-year-old men, so our experiment represents something of an upper bound on the effect greater immigration may have on future labor force participation rates in the United States.

As Figure 2.8 shows, the accumulated extra immigration after the 2005 stepping-off point makes little difference to the aggregate U.S. labor force participation rate. And even under the extreme assumption that all these immigrants will be 30-34-year-old men, the continued higher level of immigration does relatively little to slow the pace of decline in the aggregate participation rate implied by the aging of the baby boom and longer life expectancy: immigration adds back only 1 percentage point to the 6.5-point decline in labor force participation rates due to population aging. The intuition for this muted response is that adding an immigrant to the numerator of the participation rate also adds someone to the denominator, while a retiring baby boomer removes an individual from the numerator but does not change the denominator. To completely offset the effects of aging on future labor force participation rates would require the United States to add well over 1 million 30-34-year-old males annually to population in the coming years, and for those immigrants to maintain that high 30–34-year-old participation rate even as they age.

The role of immigration leads to the question of whether one is primarily interested in the labor force participation rate, or in the overall labor supply. The participation rate is only one component of labor supply, the other two being population growth and hours worked. For example, the downside risk to the participation rate posed by increased life expectancy would largely be offset by the corresponding increase in population growth when computing labor supply. In addition, while immigration does not have a large influence on the labor force participation rate, rising population growth translates into more labor supply growth and means more for measures like the dependency ratio, which are arguably more important to policy. In our experiments, while labor force participation may continue to decline, the population aged 16 years and over is boosted by more immigration. Despite the projected declines in participation rates, immigration could increase the size of the population enough that the U.S. labor force grows. However, even the annual addition of the aforementioned 200,000 immigrants to the level of the population would currently be just a 0.1 percentage point increase in the

population growth rate, a small offset when the Social Security Administration is projecting labor supply growth to decrease to 0.5 percent a year in the next eight years.

IV. Projecting Trends in Within-Group Participation Rates

Comparing the implications for the participation rate of the Census Bureau projections and the Social Security Administration projections, as shown in Figure 2.5, indicates a certain amount of consensus among government forecasters for the direct future effects of population aging on aggregate labor force participation. Although there is uncertainty in these projections concerning primarily the outlook for U.S. immigration policy and U.S. life expectancies, the current consensus is that population aging will place substantial downward pressure on labor force participation rates, as both sets of population projections imply a decline of more than 6 percentage points over the next 30 years. How reality unfolds, of course, depends on how individuals and others respond to the changing circumstances. That is, while it seems likely that the baby boomers will age, and that life expectancies will continue to rise, what is less clear is how many people will, in the future, choose to work at any given age.

In this section of the paper we rely on three different projections of labor force participation rates. The Bureau of Labor Statistics and the Social Security Administration produce regularly updated projections of participation rates, not only for the aggregate labor supply, but within narrow age and gender categories. The Bureau of Labor Statistics' projections rely on time-series extrapolations of the recent trends within narrow demographic groups. The Social Security Administration combines model-based predictions, estimates of policy effects, and observations of the lagged behavior of birth cohorts, as well as judgmental adjustments to their projections.

In addition to the projections of these two agencies, we also consider the projections of a model we designed that relies on cohort effects in order to predict the future path of participation for individual birth years. Our model contains cyclical controls and variables representing education, fertility, and socioeconomic trends, as well as the features of government transfer programs, all of which are detailed in related papers we have written. The model is estimated for men and women separately, and produces a trend-cycle decomposition for labor force participation rates in 28 age-gender demographic groups that are aggregated by population weights. With some assumptions for the future path of the policy and sociodemographic variables, the model can be used to produce projections of the participation rate trend.[16] Each method is complicated enough to warrant long separate literatures, but comparing their outcomes highlights important risks to the projections for future labor supply.[17]

One important question for projecting future trends is whether people in older age groups will begin to work more than they have in the past. This change in behavior may follow from better health at older ages, more years of expected life to finance after age 65, changes in retirement preferences, or inducements to stay in the workforce provided by business or government. The popular press has questioned whether the baby boomers may keep on working past age 65, despite the fact that at younger ages, male baby boomers have tended to work *less* than the male cohorts who preceded them; see Figure 2.9.

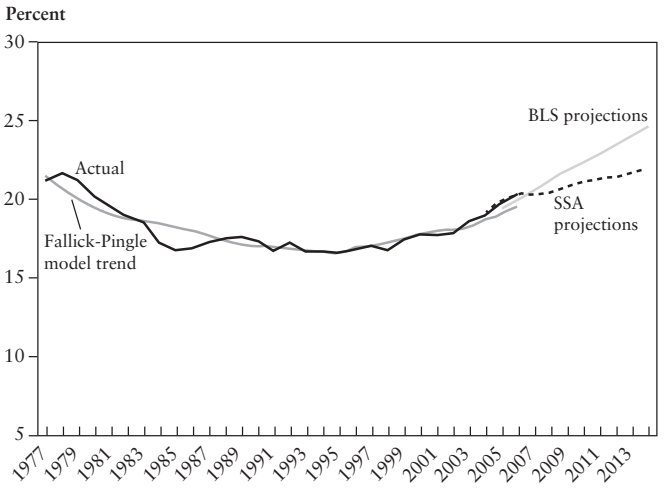

Figure 2.9
U.S. Labor Force Participation Rates for Men Aged 65 Years and Older, 1977–2017
Source: U.S. Bureau of Labor Statistics, U.S. Social Security Administration, and authors' calculations.

Among the forecasts produced by U.S. government agencies, most are in agreement that the labor force participation rates of older age groups will rise in the coming years. The participation rates for men aged 65 years and over and for women aged 65 and over are shown as the solid lines in Figures 2.9 and 2.10, respectively. The age group comprising those aged 65 years and older has increased its labor force participation markedly over the past decade. This increase, which is taking place in one of the fastest growing components of the U.S. population, has the potential to offset some of the declines in participation due to the shifts in population share.

Both Figures 2.9 and 2.10 show the historical data, the Bureau of Labor Statistics' "full-employment" projections, the Social Security Administration projection, and the projected trend from our own (Fallick-Pingle) cohort-based model. For men aged 65 years and over, all three forecasts are rising, with the Fallick-Pingle estimates roughly in line with the Social Security Administration projections. The Bureau of Labor Statistics' projections—an extrapolation of the preceding years' growth rates—point to much faster growth. In the Fallick-Pingle model the increases are attributable to a combination of longer life expectancies, higher education among the cohorts reaching these ages, and favorable Social Security incentives, specifically, the rising retirement age and the increases in the delayed retirement credit, which encourage older adults to remain in the workforce.

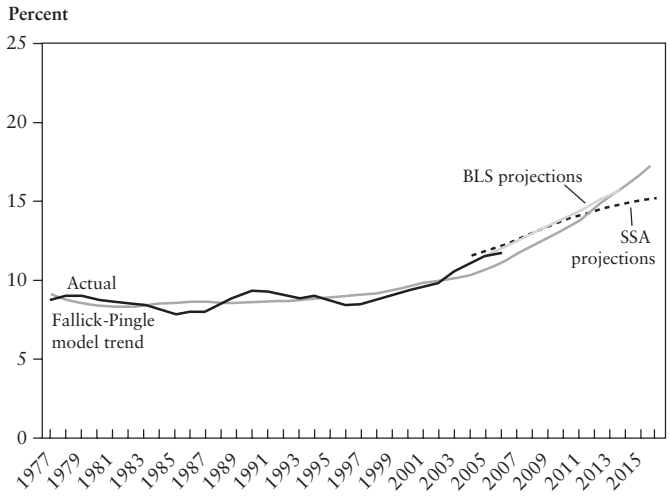

Figure 2.10
U.S. Labor Force Participation Rates for Women Aged 65 Years and Older, 1977–2017
Source: U.S. Bureau of Labor Statistics, U.S. Social Security Administration, and authors' calculations.

For women aged 65 years and over, the qualitative aspects of the forecasts are quite similar. The Fallick-Pingle trend estimates have a slightly steeper trajectory than other forecasts. In this model, these increases are largely due to female cohorts that are highly attached to the labor force—the same women who from 1970 to 1990 raised the prime-age female labor supply—filling up this older age category. All three of the forecasts expect participation rates for this demographic group will continue to rise rapidly. If we look at the rough estimates, all of the projections expect gains of nearly 0.5 percentage points per year in this group's participation rate. The share of women aged 65 years and over is expected to increase from 9 percent to 10 percent of the population over this projection horizon, to 2015. Roughly speaking, this implies this demographic group alone would add nearly 0.05 percentage points to the aggregate labor force participation rate per year. As shown in Figure 2.5, the projected pace of decline due to population aging is roughly 0.2 percentage points per year, on average, between 2005 and 2040. Thus, the increased labor force participation among older women projected by all three forecasts would offset roughly one-quarter of that decline over the period shown in the model projections.[18]

Where the various forecasts begin to diverge is among prime-age workers, those who are 25-54-years-old. This divergence is particularly important because prime-age men and women represent more than half of the population aged 16 years and over —a large weight in any aggregation. Figure 2.11 shows the historical data for prime-age men, and the forecasts for their continued labor force participation. This group's participation rate has declined steadily for nearly the entire postwar period, although the data shown begins only in 1977. Not foreseeing any reason for those declines to end, the Fallick-Pingle model extrapolates this trend forward. This estimate is roughly similar to the Social Security

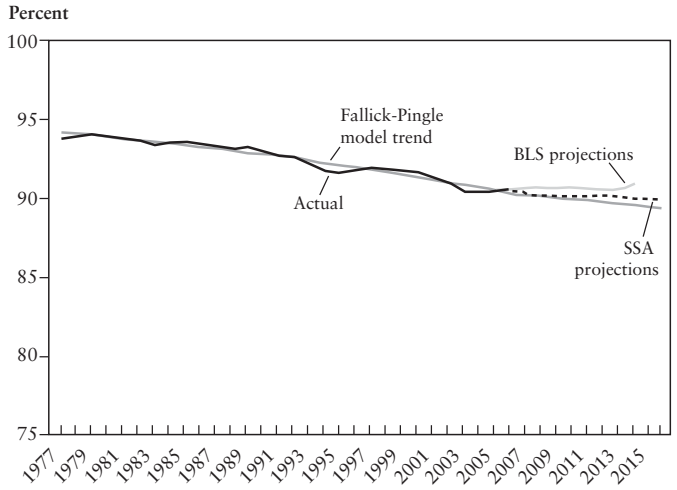

Figure 2.11
U.S. Labor Force Participation Rates for Men Aged 25 to 54 Years, 1977–2017
Source: U.S. Bureau of Labor Statistics, U.S. Social Security Administration, and authors' calculations.

Administration forecast, while in the coming years the Bureau of Labor Statistics projections expect slight increases in prime-age men's labor force participation rates. This forecast amounts to a leveling off or reversal of the data series' recent history.

As shown in Figure 2.12, more pronounced differences emerge among the forecasts for prime-age females, as the Fallick-Pingle model projects declines that the two other forecasts do not. The Fallick-Pingle model anticipates that the participation rate of prime-age women has not only leveled off, but has begun to trend somewhat like prime-age men's, with steady declines predicted in the years ahead. In contrast, the Social Security Administration predicts prime-age women's labor force participation will level off, and the Bureau of Labor Statistics projects increases that will eventually take prime-age women's participation rate to levels not seen since the business cycle peak in 2000. Given the large share of the American population represented by the age group, this divergence for

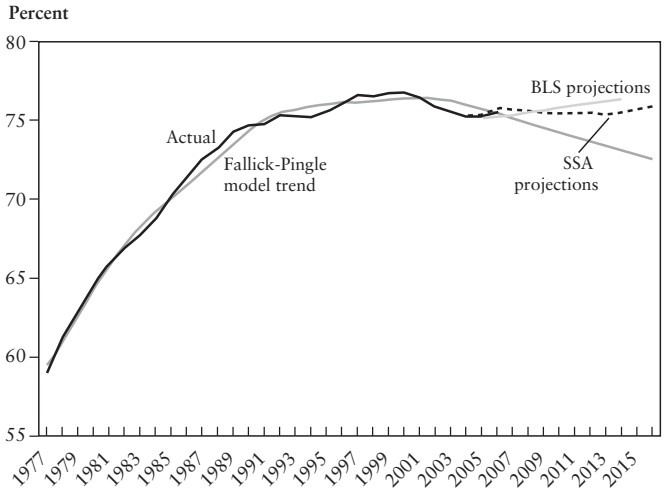

Figure 2.12
U.S. Labor Force Participation Rates for Women Aged 25 to 54 Years, 1977–2017
Source: U.S. Bureau of Labor Statistics, U.S. Social Security Administration, and authors calculations.

predicting the future labor market behavior of prime-age women accounts for a large portion of the deviations in the aggregate forecasts.[19]

The intuition behind the Fallick-Pingle estimates stems from the observed behavior of female birth cohorts over time. Figure 2.13 shows the participation rates for three age groups of women, ages 35–44 years, 45–54 years, and 55–64 years. However, instead of using the year of observation on the horizontal axis, the figure uses the birth-year cohort. As the dotted line shows, the participation of women aged 35–44 years, leveled off starting with the 1949 or 1950 birth cohort. Similarly, the participation rate of the next age group, women aged 45–54 years, also leveled off when the women born around 1949 or 1950 were in that age group (there are similar changes in slope in earlier periods which, although not shown, line up also). Thus, the pattern of a birth cohort's strong or weak labor force attachment earlier in life appears to influence that cohort's behavior later in life. For the female cohorts born in

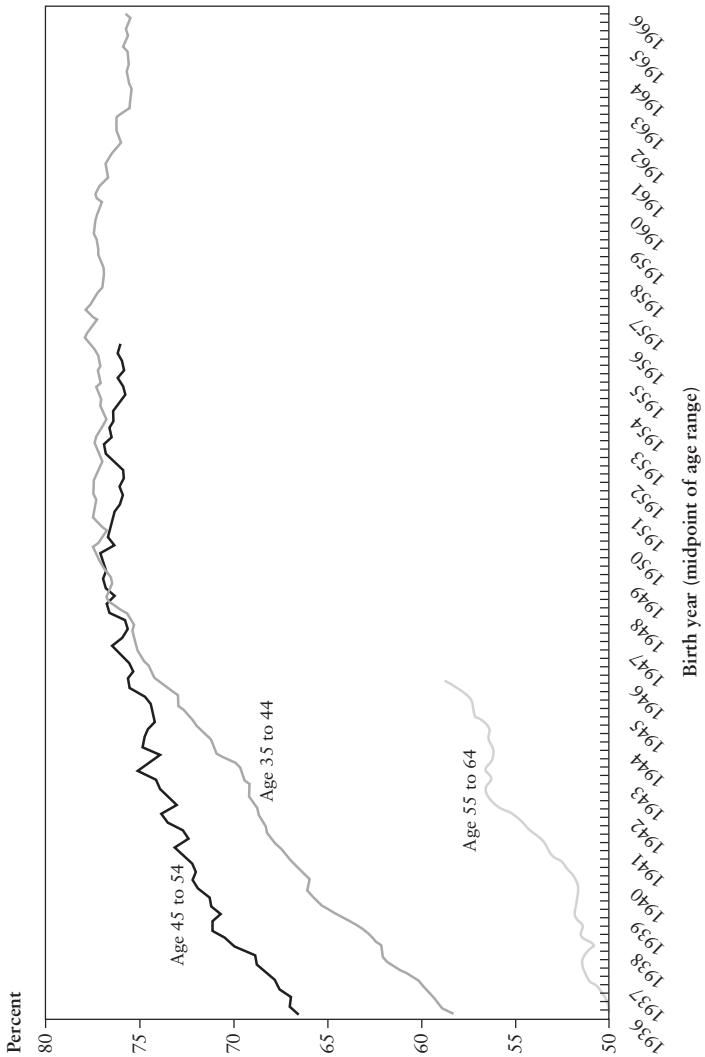

Figure 2.13
U.S. Labor Force Participation for Women Aged 35 to 64 Years, by Birth-Year Cohort and Age Group
Source: U.S. Bureau of Labor Statistics.

1957 through 1966, labor force attachment has declined from cohort to cohort, and the model carries this pattern forward. In essence, prime-age women have begun to behave similarly to prime-age men, whose labor supply has been trending down, on balance, for much of the postwar period. As of this writing, the labor force participation rate of women aged 25–54 years remains nearly 2 percentage points below the levels reached in 1997.

Although teenagers comprise only 7 percent of the U.S. population aged 16 years and over, the recent declines in their labor force participation rates have been particularly vexing to observers.[20] Figure 2.14 shows the teenage labor force participation rate, combined for males and females. Although trending down for some time, teenage labor force participation dropped precipitously following the 2001 business cycle peak, and has failed to increase even after a few years of labor market recovery. This decline is poorly explained by cyclical controls, and is not fully explained by changes in school enrollment, as a substantial amount of the decline occurred among individuals enrolled in school.[21] A full

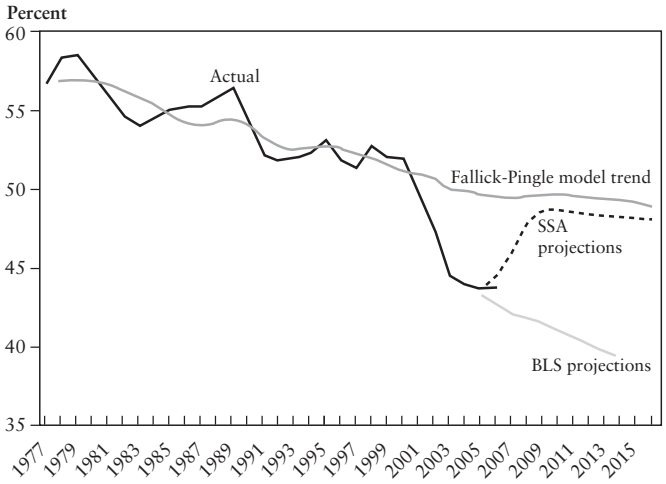

Figure 2.14
U.S. Labor Force Participation Rates for Teenagers, 1977–2017
Source: U.S. Bureau of Labor Statistics, U.S. Social Security Administration, and authors' calculations.

explanation of the labor market behavior of American teenagers remains a topic of ongoing research.

After aggregating the various components, the three forecasts for the aggregate U.S. labor force participation rate diverge noticeably—largely due to the differing assumptions made for the participation rates of prime-age workers; see Figure 2.15.

The Fallick-Pingle trend is the lowest; this forecast relies on Census Bureau weights and carries forward declines in participation rates among prime-age men and women. The Social Security Administration forecast starts with a higher level of participation among prime-age workers, reflecting the influence of an assumed smaller share of women over age 65. It also reflects a cyclical rebound that is expected to result in a 66.5 percent labor force participation rate for this group in 2007, then remains level, and then trends down beginning in 2009, although not quite at the pace predicted by the Fallick-Pingle model. This slower pace of decline in the Social Security Administration projections is in large part a function of the steep increases in teenage participation rates it has

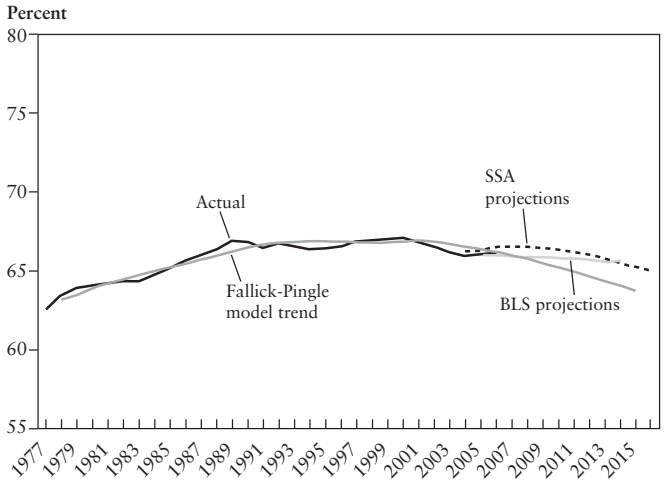

Figure 2.15
U.S. Aggregate Labor Force Participation Rates, 1977–2017
Source: U.S. Bureau of Labor Statistics, U.S. Social Security Administration, and authors' calculations.

Table 2.1
Aggregate U.S. Labor Force Participation Rates (annual averages)

Year	BLS	SSA	F/P
2005	66.0	66.28	66.37
2007	65.9	66.50	66.02
2008	65.9	66.43	65.51
2011	65.8	66.21	65.00
2013	65.6	65.76	64.40
2015	n.a.	65.25	63.79

projected. Even the Bureau of Labor Statistics estimates project aggregate labor force participation rates to edge lower in the coming years—see Table 2.1—despite robust increases forecast within nearly every age group (with the notable exception of teenagers) that will offset the downward pressures from population aging. However, as the Fallick-Pingle trend estimates show, even forecasts of strong increases in labor force participation among older age groups are not enough to offset the deeper influence of population aging in the United States. Moreover, if the labor force participation rate for prime-age workers trends down, this age group's behavior will exacerbate the declines in U.S. labor force participation rates due to population aging.

V. Policy Responses

The three projected forecasts for future U.S. labor force participation rates discussed thus far in this paper do not consider possible policy responses beyond those already enacted. As these currently stand, the Social Security, Medicare, and private pension programs embed a long list of incentives that influence the American labor supply. Large scale changes in old age programs in the United States have been rare, and policy can react with quite a lag to changing conditions. For example, the increase in U.S. women's labor supply began in earnest in the early 1960s, but federal legislation and even corporate responses to needs such as family leave, did not take hold until the early 1990s. However, within the United States,

income maintenance programs, family leave, and Social Security benefit programs have all been changed by major federal legislation in the past, and will likely be changed in the future. Such changes could have major implications for future labor supply.

Given the rising population share of older Americans, old-age programs are likely to be a particular focus of U.S. public policy in the coming years. There have been few substantive changes in these programs since the early 1980s. In 1983, the Greenspan Commission on Social Security reform suggested altering the program's incentives on when to retire and ultimately the recommendations became law. Called the National Commission on Social Security Reform, it was formed as Congress and the Reagan administration became worried that the Social Security system, facing a financial crisis, might be insolvent by the middle of that decade. That fear, combined with the projected long-run deficits expected with the retirement of the baby boomers, prompted Congressional action to encourage workers to delay receiving benefits (see Pingle 2006).

Traditionally, Americans first qualified for Social Security benefits at age 62, and then qualified for full benefits at age 65, termed the Normal Retirement Age (NRA), the age at which one qualifies for their Primary Insurance Amount (PIA). The 1983 amendments raised the NRA gradually from 65 to 67, but this shift has begun only in the few most recent years. The legislation delayed the June 1983 cost-of-living increases. The amendments also changed the Retirement Earnings Test penalty for people turning age 65 in 1990 or later—reducing the penalty levied on Social Security payments/benefits from $1 of every $2 earned by people over an earned income limit, to $1 of every $3. Subsequently, in 1996 new legislation raised the previous earned income limit, and in 2000 the Retirement Earnings Test was changed so that it only applies to people who are between 62 years of age and their NRA.

The 1983 amendments substantially changed the Delayed Retirement Credit (DRC) beginning with the cohort born in 1925 turning 65 in 1990. The DRC raises an individual's lifetime Social Security benefits for each month that he or she delays receiving their benefits after reaching their NRA—traditionally when someone turns 65. The DRC was instituted in 1972 to provide a 1 percent bonus to a person's remaining Social Security pension to compensate for each year past age 65 a person delayed

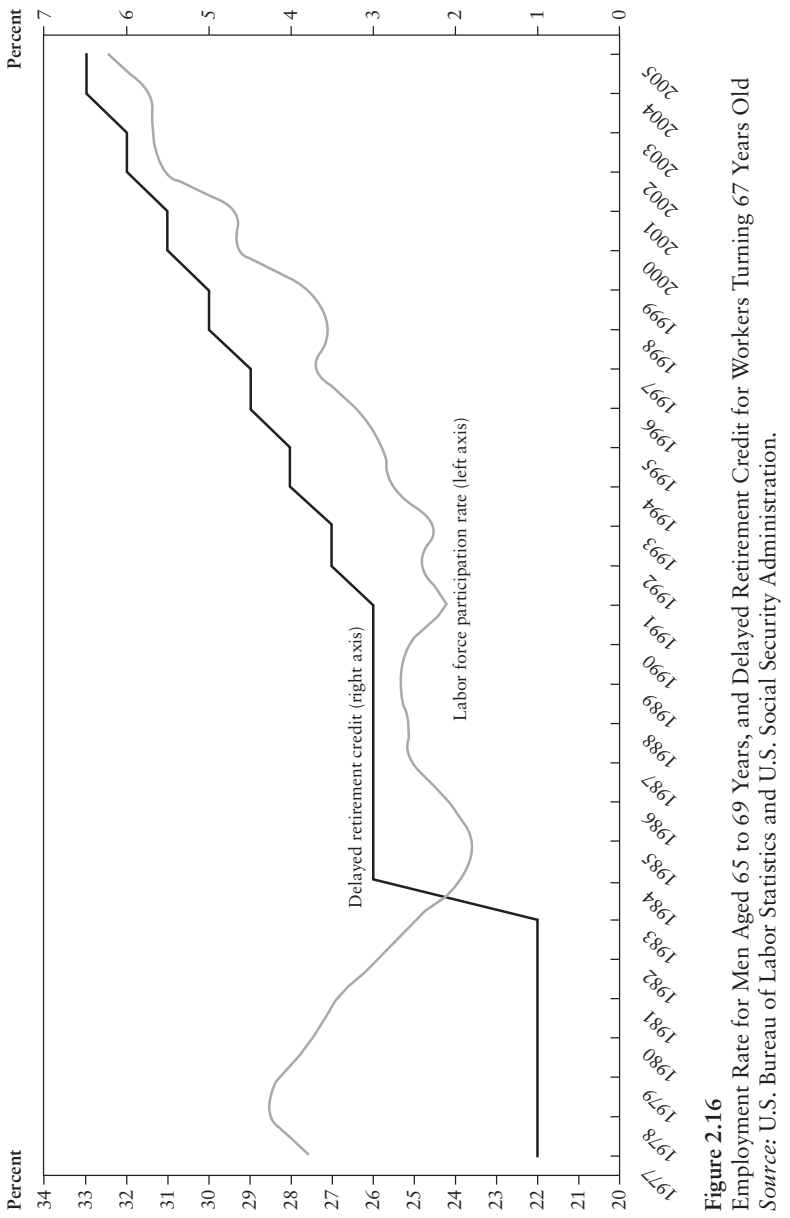

Figure 2.16
Employment Rate for Men Aged 65 to 69 Years, and Delayed Retirement Credit for Workers Turning 67 Years Old
Source: U.S. Bureau of Labor Statistics and U.S. Social Security Administration.

receiving benefits, until age 70, in order to at least partially make up over time for the present value of the deferred benefits. The credit is applied in monthly increments so that past an eligible recipient's 65th birthday, for each month during which benefits are not received, there is an upward adjustment in the lifetime amount of the monthly Social Security payment the individual eventually receives. The 1983 amendments increased the DRC from 1 percent to 3 percent. The new, higher levels of the DRC were assigned by the year an eligible worker was born. Under the new policy, the DRC rose from a 3 percent additional benefit for those born in 1924 or earlier, in half-percent increments every two birth years, until the credit reaches 8 percent for individuals born in 1943 or later. Thus, the DRC increased for workers born in 1925 or later, in effect starting in 1990 when that birth cohort turned 65.

As shown in Figure 2.16, the rising levels of the DRC correspond closely to the increases in male labor supply among men in the affected age group. This increase bucks the trend towards lower labor force participation rates among younger men. Empirical estimates of the influence of the DRC are not the specific subject of this paper, although the Fallick-Pingle projections do include the policy as a right-hand-side variable. The point is that in the years ahead, this type of policy change might influence labor supply, and as-yet-unenacted policy changes have not been accounted for in any of the forward-looking estimates shown in this paper. Outside of Social Security, as the U.S. labor force ages firms may redesign workplace policies to attract and accommodate more senior employees. However, predicting such future responses is an essentially impossible task at the present time. It took 30 years after female labor force participation had begun climbing steeply in the early 1960s before comprehensive family leave legislation was enacted in the United States. How the future course of policy may eventually evolve is anybody's guess.

VI. Conclusion

The rate at which individuals participate in the labor force declines precipitously beyond age 50. This behavioral feature of labor supply suggests that ongoing shifts in the age distribution of the U.S. population have already begun to put substantial downward pressure on the nation's aggregate labor force participation rate. Although projections of such pressure in years to come rely on current projections for the evolution of the age distribution of the population—estimates which are sensitive to assumptions about future mortality rates and immigration—different population projections have relatively little influence on the degree of downward pressure aging will exert on the aggregate participation rate. Instead, the extent to which population aging will depress aggregate participation rates in the U.S. labor force rests critically on how the participation rates within the various age groups evolve. In the end, however, substantial increases in participation rates across almost all age groups of both genders would be needed to completely offset the projected declines in labor force participation predicted over the next 30 years.

Unforeseen endogenous responses aside, the U.S. population is aging. The baby boomers are undoubtedly moving into lower participation rate age groups, relatively small younger cohorts are or will be moving into high participation rate age groups, and life expectancies are lengthening. While current labor market projections expect rising participation among older workers, a reasonable consensus is building that suggests U.S. labor supply has already slowed due to population aging and will slow further in the years ahead. The agreement among the three projections described in this paper is that the outlook is for slower growth in U.S. labor supply from 2007 onward than was the norm in the 1965–2000 period. Certainly, considering the information now in hand, the Social Security Administration's projection for labor force growth to slow to 0.5 percent a year by 2015, only seven years away, is a reasonable expectation, recognizing that there are reasonable scenarios that could lead to higher or lower growth rates. This is 25 percent of the pace observed from the three decades spanning the 1960s through the 1980s. How economists and U.S. policymakers build this general prediction into their thinking about the future performance of the macroeconomy is one of the most important research and public policy discussions on the contemporary research and policy agenda.

■ *The views expressed in this paper are those of the authors and do not represent the view of the Federal Reserve System or its staff. The authors wish to thank Stephanie Aaronson, Andrew Figura, and William*

Wascher, who co-authored a related paper on this topic. Special thanks also go to Karen Smith at the Social Security Administration for providing detailed data that underlies the agency's labor force projections, and Mitra Toosi who provided data and answered questions on the Bureau of Labor Statistics's long-run projections for labor supply. In addition, we received useful input for this line of research from Daniel Aaronson, Gary Burtless, Chinhui Juhn, Charles Fleischman, Julie Hotchkiss, Joseph Lupton, Lisa Lynch, Mark Schweitzer, Daniel Sullivan, Joyce Zickler and seminar participants at the Bureau of Labor Statistics. Leslie Carroll and Andrew Strauss provided expert assistance.

Notes

1. Social Security Administration 2007 Trustees Report.

2. See Fallick and Pingle (2007) for more discussion of the recent history.

3. This computation can be seen by using the Current Population Survey data, holding the participation rates within age groups fixed at their levels at some point in history and then allowing the actual population shares to evolve.

4. Bradbury (2005); Aaronson, Park, and Sullivan (2006); Aaronson, Rissman, and Sullivan (2004); and Toossi (2005).

5. An earlier version of this model was used in Aaronson, Fallick, Figura, Pingle, and Wascher (2006).

6. As shown in Fallick, Fleischman, and Pingle (2007), the declines do not depend on the base year chosen.

7. See West and Robinson (2005). "Understanding Factors that Contributed to the Large Error of Closure in Census 2000, a note available online at: http://paa2005.princeton.edu/download.aspx?submissionId=51262

8. The Census Bureau's population estimates are updated annually, while the Census Bureau's projections are updated about twice a decade. Therefore, the Census Bureau's projections for future population levels may not be consistent with its best current estimate of the historical population. This difference has implications for measuring labor force participation in real time, and highlights where some projection risks may lie. For example, the incoming population estimates reflected in the 2005 Current Population Survey population shares have more downward pressure on aggregate labor force participation than the share implied by the projections that the most recent Census Bureau estimates have superseded. Again, in January 2006, revisions to population estimates prompted revisions to the weights in the Current Population Survey, from which U.S. labor participation is officially measured. The resulting new population estimates, all else remaining the same, caused labor force participation rates to be revised downward by two hundredths of a percentage point.

9. The data used in this paper that refer to Social Security Administration estimates and projections refer to the data underlying the Social Security Administration 2006 Trustees Report, unless otherwise mentioned.

10. According to Ward Kinkaide in the Census Bureau's population projections branch, one reason for little extrapolation of life expectancy by birth cohort is because the data for many of cohorts born early in the century are of poor quality, thus limiting the ability to assemble a long time series of full-age-span life tables that can be used to project their evolution forward.

11. See Wilmoth (2005) for discussion of mortality rates, their history, and their role in population projections.

12. The risks to the immigration assumptions are essentially risks to the net immigration of Hispanics. As Figure 2.7 shows, Hispanic males in the United States have high labor force participation rates, but the same does not apply to Hispanic females.

13. For more discussion see Passel (2006). Jeffrey S., "Size and Characteristics of the Unauthorized Migrant Population in the U.S.," Pew Hispanic Center, 2006.

14. Here we assume that the immigrants would have the same participation rate as the general population.

15. The Pew Hispanic Center estimates that net undocumented immigration in 2006 was 500,000. The addition of 200,000 more immigrants per year would imply a large margin of error to existing estimates. However, we recognize that estimating the flow of undocumented immigrants likely has wide confidence intervals.

16. See Fallick and Pingle (2007).

17. Discussion of the Bureau of Labor Statistics projections can be found in Chapter 13 of the 2007 edition of the Bureau of Labor Statistics Handbook of Methods. This is available at http://www.bls.gov/opub/hom/homtoc.htm. The Social Security Administration projections are discussed in the Trustees Report, available on-line at http://www.ssa.gov/OACT/TR/TR07/index.html. For more information on the estimation of Social Security Administration participation rates, see the Technical Panel on Assumptions and Methods (2003).

18. This offset refers to only one aspect of the influence of this age group, as the growth in the population share of these age groups with participation rates well below average are an important part of the downward pressure on labor force participation resulting from population aging.

19. Although the data from the 2007 Trustees Report was released too late to be incorporated into this paper, one correction made to the Social Security Administration projections was to revise downward the forecasts for various groups of prime-age women. For example, the future projection for females aged 45–54 years in 2016 was revised from 74.2 percent to 73.9 percent.

20. For discussion of this decline, see Aaronson, Park, and Sullivan (2006).

21. This is easily verified using the Bureau of Labor Statistics data series from the basic monthly Current Population Survey.

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Comments on "The Effect of Population Aging on Aggregate Labor Supply in the United States" by Bruce Fallick and Jonathan Pingle

Chinhui Juhn

After nearly four decades of growth, the U.S. labor force now faces the prospect of two negative blows—the retirement of the baby boom cohort and the cessation and possibly the reversal of female labor supply growth. Fallick and Pingle show that if age-specific participation rates remain at today's rates, the aging of the U.S. population could potentially offset the entire growth in the aggregate labor force participation rate we have witnessed since the mid-1960s. While there are some debatable issues regarding their exact calculation of population shares—such as projection of mortality rates and future immigrant inflows—the key question stemming from their analysis that I will focus on is: will future age-specific labor force participation rates will remain at today's levels? In particular, there are two critical groups—the older adult populations (those aged 65 years and over, and those at 55–64 years of age nearing retirement) and prime-age women between the ages of 25–54 years. Will the baby boom cohorts work longer relative to previous cohorts? Has the labor force participation rate of married U.S. women not only stopped climbing, but are there signs in the last decade that the trend has actually reversed?

On the question of older Americans, models by Fallick and Pingle and two government agencies, the Bureau of Labor Statistics (BLS) and the Social Security Administration (SSA) are in agreement and their collective outlook is fairly positive—that is, if having older Americans work longer is the goal. The authors list several factors that, going forward, seem to predict rising labor force participation rates for older groups. Among these factors are longer life expectancies and hence longer retire-

ment periods that need to be financed, better health, increases in education, and changes in the Social Security program that reduce the incentive to retire early. I would like to mention two other contingent factors. The first is the possibility that the increased labor force attachment of women is not only likely to increase participation among the women themselves at older ages, but also their husbands' participation rates, given the often-found complementarity in spouses' retirement behavior. Table 2.2 shows how for different age groups, a husband's labor force participation is related to his wife's labor force participation. The marginal effects reported in the first row of the top panel show that a wife's participation in the labor force increases her husband's participation, and this complementary/mutually reinforcing effect rises steeply with age. For men aged 55–64 years, having a wife who is in the labor force increases the husband's participation probability by 12.5 percentage points. At age 65 years and over, the marginal effect is 22.3 percentage points. While the table to some degree reflects positive assortative mating, the increasing

Table 2.2
Husband's Labor Force Participation as Function of Wife's Participation

	Husband's Age				
	25–34	35–44	45–54	55–64	65+
All Years: 1968–2006					
Wife in the LF	0.007	0.014	0.029	0.125	0.223
Number of Children <=18	0.002	0.003	0.002	0.011	0.034
Observed Probability	0.968	0.964	0.930	0.733	0.198
Recent Years: 1996–2006					
Wife in the LF	0.013	0.020	0.048	0.167	0.262
Number of Children <=18	0.004	0.008	0.006	0.023	0.063
Observed Probability	0.961	0.956	0.922	0.720	0.194

Source: March Current Population Survey 1968–2006. The sample includes married men who are 25 and older. The above reports the marginal effects from probit regressions with husband's probability of being in the labor force as the dependent variable. The regression also included husband's age, husband's and wife's education dummies, and year and state fixed effects.

positive association over the life cycle most likely reflects the complementarity of time spent at home for retired spouses. The bottom panel shows that this effect has in fact become more pronounced in the last ten years, 1996–2006, with the marginal effect for 55-64-year-old men rising to 16.7 percentage points. Of course these numbers all refer to married men. For this 55-64-year-old age category, the availability of disability benefits, together with lackluster demand for less-skilled workers, will likely continue to put downward pressure on the participation rates of less-skilled unmarried men in this age group.

Another factor not mentioned by Fallick and Pingle, but likely to become important in the next several decades, is the decline in employer-provided health insurance for retired workers. Between 1988 and 2005, the share of large firms (those having 200 or more employees) offering health insurance to their active employees and also offering health insurance to their retired employees declined precipitously from 66 percent to 33 percent. Current retirees and near-retirees may be grandfathered into employer-provided retirement health plans, so that we may not see much change in coverage rates in recent years. However, successive cohorts of retirees are surely less likely to receive such generous health benefits from their former employers. This decline in retiree health coverage could be another factor that boosts the labor force participation rate of 55-64-year-olds.

Let me now turn to prime-age women, those in the 25-54-year-old age group. The authors' forecast of these women's labor force participation differs considerably from the forecasts made by other government agencies. As illustrated in their Figure 2.12, by the year 2015 there is almost a 3 percentage point difference between the Fallick and Pingle forecast and the other forecasts. Yet the behavior of women has in the past proven to be notoriously difficult to forecast. I doubt that anyone in the 1950s or 1960s would have accurately forecasted the acceleration in married women's labor force participation during the 1970s and the 1980s. The point is, this exercise in forecasting the future is largely a guessing game. However, the authors' projections of the decline in the participation rate of prime-aged women is, in my view, overly pessimistic. First, while the rise in participation of married women has definitely come to a stop, I

do not see evidence of an actually declining trend. Second, I have some reservations about the authors' cohort-based approach.

Table 2.3 examines the labor force participation rate of prime-age women using the March Current Population Survey. The columns report three-year averages centered on the indicated years. As shown in the top row of the table, participation between 1980 and 1990 rose rapidly by nearly 10 percentage points in this decade. Since 1995, however, prime-age women's labor force participation has remained virtually constant, which suggests that the factors that lead to the rapid rise in the earlier

Table 2.3
Labor Force Participation Rates of Prime-Age Women

	Year				
	1980	1990	1995	2000	2005
Unemployment Rate	6.8	5.9	5.7	4.3	5.1
Women, Aged 25-54 Years Old	64.0	73.6	75.5	77.3	75.2
A. Marital Status					
All Married	59.3	70.6	73.6	74.4	72.6
Widowed/Divorced	74.9	79.2	79.4	82.4	79.6
Never Married	81.1	81.0	78.8	82.6	79.9
B. Mothers vs. Non-Mothers[1]					
Mothers	58.4	68.5	71.3	73.8	71.9
Non-Mothers	73.6	80.2	80.8	81.2	79.0
C. Young College Mothers vs. Never Married College Women[2]					
Young College Mothers	55.0	68.2	72.6	71.3	72.7
Never Married College Women	94.5	94.2	95.5	92.0	93.3

Source: March Current Population Survey micro data. The numbers in the columns refer to three-year averages centered on the indicated years.
[1]"Mothers" are defined as women with at least one child of their own who is aged 18 years or younger, never married, and living in the household.
[2]"Young College Mothers" refers to white married mothers aged 25–34 with a college degree while "Never Married College Women" refers to never married white women aged 40–49 with a college degree.

decades had largely played out by the mid-1990s. Their participation rate did rise from 1995 to 2000. However, the higher participation rate most likely reflected favorable cyclical conditions, as the aggregate unemployment rate in 2000 was at the lowest level since the late 1960s. During the latter half of the 1990s, welfare reform and the expansion of the Earned Income Tax Credit (EITC) also spurred strong employment growth among less-educated women. Since 2000, prime-age women's participation rate fell 2.1 percentage points. Despite articles in the popular press proclaiming that mothers are "opting out" of the U.S. labor force, participation rates fell by a smaller amount among married women than never-married women—1.8 percentage points versus 2.7 percentage points. Participation among mothers fell 1.9 percentage points, while participation fell 2.2 percentage points among non-mothers. In other words, when we take into account the weaker labor market conditions in the early 2000s by comparing the labor market behavior of married women against the behavior of non-married women, there is little evidence that the trend among married mothers—the group that fueled the increases in the earlier decades—has actually reversed and begun to decline.

Let me now turn to my reservations about the authors' cohort-based approach. Fallick and Pingle rely on a cohort-based model in which they assume a constant age profile and permanent cohort effects. This is an especially hazardous exercise for predicting women's behavior, since every birth cohort of women has a unique profile of labor force participation. The authors also use time-varying variables such as life expectancy, fertility, and the marriage rate as explanatory variables in their model. The problem is that in a reduced-form model, the coefficients are unlikely to be stable over time. To make this point, Figure 2.17 shows trends in U.S. women's labor force participation rates and marriage patterns—the percent "ever married" at age 25–29. The figure is arranged by birth cohort. Using only the earlier part of the data, we would end up with a large negative coefficient and would over-predict participation rates for the more recent birth cohorts based on marriage patterns, thereby estimating negative cohort effects. It is not clear that using information on previous cohorts leads to better predictions than are obtained by simply extrapolating from the more recent trends. To summarize, Fallick

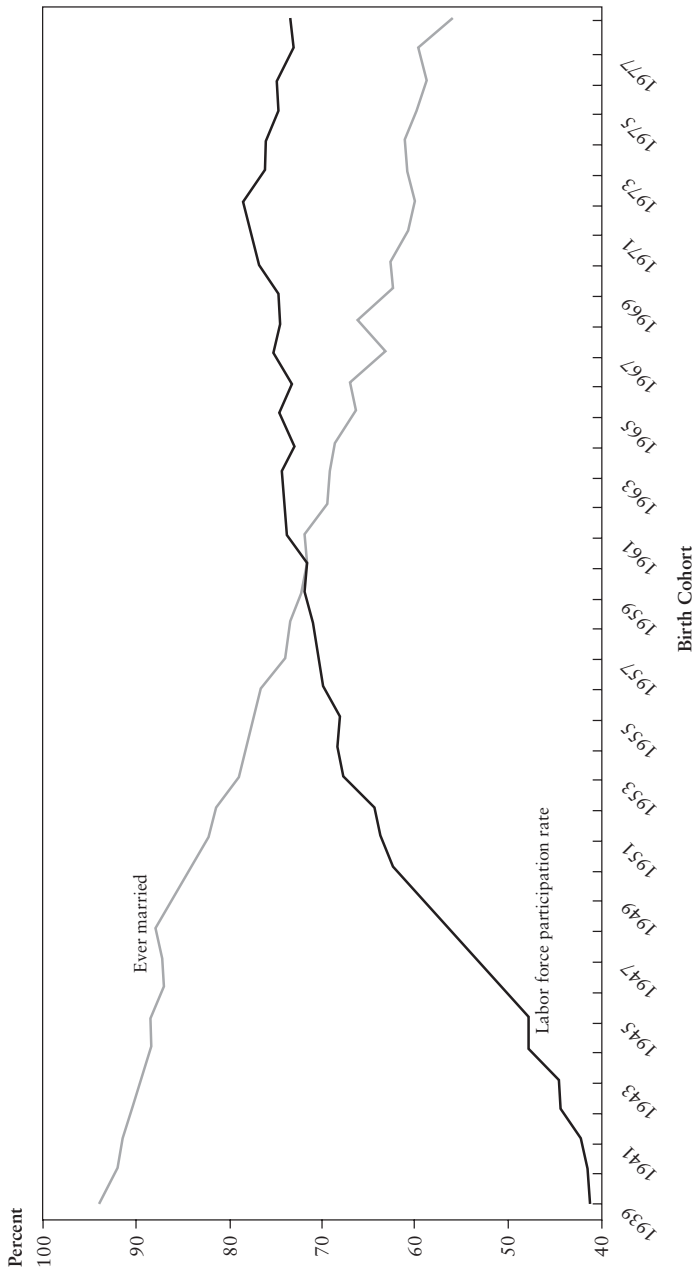

Figure 2.17
Labor Force Participation Rates and Marriage Rates for American Women Aged 25 to 29 Years, by Birth-Year Cohort
Source: Current Population Survey (U.S. Census Bureau) and U.S. Bureau of Labor Statistics.

and Pingle make an important point and demonstrate an undeniable fact that the aging of the U.S. labor force will put downward pressures on the aggregate labor force participation rate. However, in my view their projections of the within-group participation rates, particularly those of prime-aged women, are more conjectural and overly pessimistic than is warranted by a fuller examination of the data.

Finally, I would like to take a step back to look at the bigger picture. We are worried about the impact of aging and other labor force trends on potential economic growth in the United States. But in addressing this topic, we have ignored some important issues. So far we treated labor as homogenous in skill, and we have not made a distinction between shifts in demand and supply. Clearly the aging of the American labor force entails an inward shift in the aggregate labor supply curve, since older workers are less inclined to work than younger workers at the same wage. With regards to the decline in the labor force participation of prime-aged men, however, evidence points toward declining demand for their services. In view of the lackluster performance of recent wage growth, with the exception of the very top of the wage distribution, it seems not so much the lack of available working age men that is the problem. In fact, there appear to be too many men who are not very productive and employable. We may have a labor "supply" problem of sorts, but it is more of the "skills-mismatch"variety rather than simply the shortage of workers per se.

Notes

1. I draw here from a recent paper by Schirle (2007) and my own paper with Simon Potter (2007).

2. Kaisier Family Foundation and Health Research and Educational Trust (2005), also reported in Strumpf (2006).

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Juhn, Chinhui, and Simon Potter. 2007. "Is There Still an Added Worker Effect?" Working Paper, University of Houston, June.

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Comments on "The Effect of Population Aging on Aggregate Labor Supply in the United States" by Bruce Fallick and Jonathan Pingle

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Bruce Fallick and Jonathon Pingle have written a thought-provoking paper that helps set the stage for our discussion on labor supply in the twenty-first century. The paper carefully documents how—conditional on no changes in the participation behavior of workers, especially older workers—current projections of population aging will imply a decrease in the aggregate labor force participation rate in the United States of 6 full percentage points over the next 35 years. This is a huge change with significant implications for our forecasts of potential aggregate output and consequently for our conduct of monetary policy. However, before we panic too much over this large projected decrease in the aggregate labor force participation rate, there are a few caveats to keep in mind.

First, making predictions about what might happen in 35 years time, let alone 20 or even five years in the future, is a hazardous business. If 35 years ago we had used the 1972 labor force participation rates by gender and age, and had allowed the population shares to evolve as then forecast by the Census Bureau, it is doubtful that we would have come close to mapping the marked rise in labor force participation rates that the authors show in their Figure 2.3. Second, potential output is driven not only by labor force participation rates, but also by human capital and the quality of labor. Declines in labor force participation rates may not be as much of a concern in a context of rising labor productivity. Therefore, investments in education and training, along with investments in physical capital, will also play a critical role for future potential output growth.

Nevertheless, understanding the potential impact of an aging workforce is important for policymakers. The paper begins by providing a very thorough discussion of the assumptions behind the various govern-

ment projections for the U.S. population over the next 35 years. Particularly important is the discussion, as illustrated in the authors' Figure 2.8, of the impact on the projected path of labor force participation rates by adding 100,000–200,000 net new immigrants annually in the coming years to the 30-34-year-old male age group. Fallick and Pingle argue that even such a large increase to the U.S. working-age population could not reverse the underlying downward pressures on the projected labor force participation rate over the next 35 years, everything else staying constant. This is a very important simulation and one that is not that far removed from possible reforms of immigration policy in the United States. The Congressional Budget Office[1] recently released a report concluding that proposed immigration legislation in 2007 would increase the U.S. population by 1.8 million people in ten years time; this estimate translates into adding approximately new 180,000 workers a year.

Although Fallick and Pingle explain why even fairly large changes in U.S. immigration policy will have a limited impact on labor force participation rates, it is important to note that such increases would increase the overall supply of labor in the United States. In addition, their simulations assume that labor force participation rates for immigrants will be the same as for native-born American men in the age class of 30–34 years. However, we know from the Bureau of Labor Statistics that labor force participation rates for foreign-born males are much higher than for native-born males—almost 82 percent versus 72 percent for native-born workers.[2] Finally, an important component of recently proposed immigration legislation is a reconsideration of the relative priority placed on family unification versus specific professional skills for immigration policy. This potential policy change poses significant implications for future labor productivity in the United States. If we shift our immigration policy toward one that gives more weight to admitting more highly skilled people, we may not adjust the labor force participation rates significantly, but this shift would have an impact on labor productivity. So the ultimate impact on our economy of a change in immigration policy is not only on the number of people participating in the labor force, but also encompasses the human capital that is embodied in these individuals.

The paper then turns to the projections of within-age group participation rates. There are two critical parts to this discussion—what is going to happen to older workers' labor force participation rates, and what is going to happen to the labor force participation rates of men and women aged 25-54-years-old. In terms of older workers, we have seen a steady increase in the labor force participation rate of male workers over the age of 55 since the mid-1990s. I would argue, as do Munnell and Sass in their conference paper, that this increase has been fueled in part by declines in employer-provided healthcare for retirees, changes in Americans' retirement financial security due to improved health and changes in the composition of pension assets, changing occupational characteristics of workers, rising educational levels, and technologies that make working from home easier. Forecasting just how much more labor force participation rates might increase for this older age group is challenging but Fallick and Pingle, the Bureau of Labor Statistics, and the Social Security Administration all seem to agree that this participation rate will continue to rise in the near future.

However, there is much less consensus on what is going to happen to labor force participation rates of workers aged 25–54 years. Using projections from a model that relies on cohort effects to predict the future path of participation of individual birth years, Fallick and Pingle expect that labor force participation rates for prime working-age males will continue to decline, a pattern seen over the past 30 years. This prediction begs the question of why the participation rate for prime-age male workers has been falling. Without a better understanding of why labor supply for this group has been declining, it is difficult to assess whether or not extrapolating that trend forward makes sense or not. Changes in the generosity of disability insurance, incarceration rates, and school enrollment patterns may all be playing a role here. In a technical background paper associated with this conference paper, Fallick and Pingle (2007) present more details on the model they use to predict the future path of labor force participation. Specifically, in an enhanced model they show how controlling for schooling, along with age and cohort effects, is important for explaining past trends in male labor supply. However, they do not include controls for disability eligibility, changes in replacement rates associated with disability insurance, or incarceration rates. Those men in prison are not included in the numerator or denominator of the civilian labor force participation rate, so in principal changes in the U.S.

male prison population are irrelevant for male labor force projections. However, if we assume that incarceration rates are positively correlated with the pool of potential criminals, and we assume that potential criminals have a lower labor force participation rate, as suggested in work by Western, Kling, and Weiman (2001), then controlling for this variable/effect might be useful. In terms of the potential impact of enhanced disability insurance on labor force participation, we know from the work by Autor and Duggan (2003) that among males aged 25–54 years, receipts of disability insurance rose by 50 percent between 1984 and 1999. The increase was even more dramatic for those men without a high school diploma. While Fallick and Pingle have tried including the fraction of applications for disability insurance approved in each year in their model of labor force participation, they omit this variable due to its limited explanatory power. However, other proxy measures, such as the disability insurance replacement rate for low-skilled workers or the disability insurance application rate per capita, might provide more explanatory power.

The largest point of departure in the labor force projections generated by the Fallick and Pingle model versus those provided by the Bureau of Labor Statistics and the Social Security Administration has to do with the projected 25–54 year-old female labor force participation rate. Fallick and Pingle predict that the leveling off in female labor force participation that we have seen over the last couple of years will actually start trending down since, "women have begun to behave similarly to prime-age men." In large part, their claim is driven by trends in labor force participation rates that they observe for women born after 1950 when they reach the ages of 35–44 years. I want to suggest a couple of reasons why you might want to question the projections for this group that come out of Fallick and Pingle's model.

First, let me just state the obvious: since the level of women's labor force participation is not equal to men's, it is does not follow that the rate of change should exhibit the same pattern as men's. Second, Fallick and Pingle argue that more recent cohorts of women seem less attached to the labor market than past cohorts. However, in their technical background paper, the authors state that they drop the eight birth-year cohorts who entered the labor market after 1996 due to small sample sizes. I would

suggest that more recent cohorts are unlikely to be similar to previous cohorts simply on the basis of the educational choices they have been making. In Figure 2.18 we see that college enrollment rates for males and females have been trending steadily upwards since 1973, especially for women. But since the early 1990s, women have been behaving differently than men and enrolling at a higher rate in four-year colleges. The more recent cohorts of women are clearly exhibiting a greater taste for investment in higher education. This difference may actually mean that going forward, we will see a further divergence in the labor supply behavior of American men and women that reflects these different educational choices.

The role of technology is another issue that I think is quite important, but that has not been addressed in any of the papers presented here. Technology has had a profound impact on the labor supply of successive cohorts of women during the twentieth century. Improvements in maternal health and the availability of infant formula, as discussed by Albanesi and Olivetti (2007), meant that women who were born in the early part of the twentieth century spent much less time engaged in the production

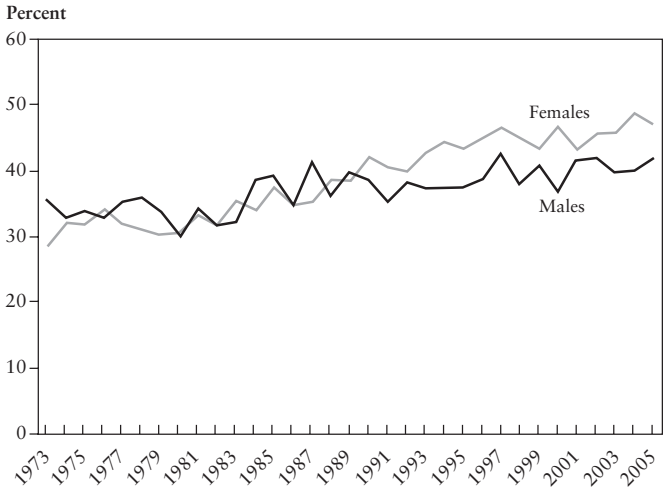

Figure 2.18
U.S. Four-Year College Enrollment Rates
Source: Digest of Education Statistics and U.S. Department of Education.

of children. This in turn allowed them to have more time to be active in the labor market. The introduction of labor-saving devices that freed women from certain household chores and the introduction of the Pill affected subsequent cohorts of women and their labor supply decisions.

Those women born after 1950 have experienced yet another technological innovation—fertility-enhancing reproductive technologies. These innovations started becoming available during the mid–1980s, when those born in 1950 were moving into the age range of 35–44 years, and insurance coverage for these treatments gradually expanded through the 1990s. These reproductive technologies have had a dramatic impact on birth rates by age of the mother, as shown in Figure 2.19. For example, if we compare the birth rates for women aged 35–39 years in 1980 and in 2005, we see that these rates have more than doubled. At the same time, teenage birth rates and birth rates for women aged 20–24 years have been declining. As women defer childbearing to later years, it is not clear whether or not the tapering off or decline in labor force participation we see in women aged 35–44 years will then reverse itself as they

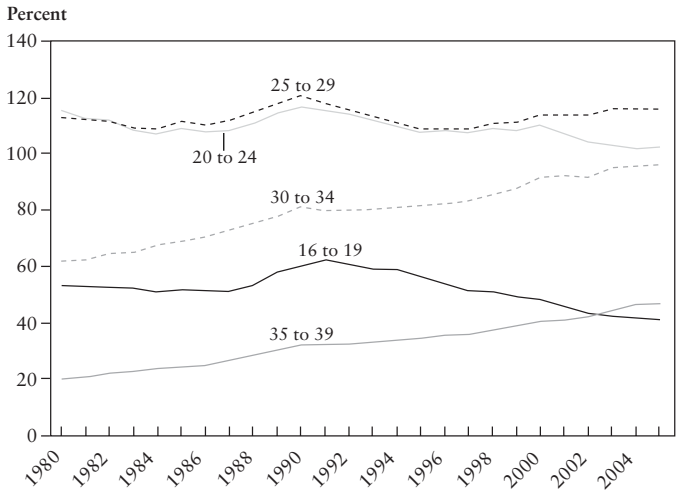

Figure 2.19
U.S. Birth Rates by Age of the Mother
Source: National Center for Health Statistics and U.S. National Vital Statistics.

get older. Fallick and Pingle try to address the impact of fertility in their extended model by including controls for fertility. However, they only do this for women aged 18–29 years. This means that they have not been able to incorporate into their projections how this technological shock may affect labor market decisions of older women. Older women who may have withdrawn from the labor market to take care of young children may exhibit very different re-entry patterns into the labor market than those who had children at a much younger age.

Finally, the aging of the U.S. working population will also have an impact on labor productivity. As workers age, they amass more experience and, depending on the amount of skills investment they have received on the job, they may also have higher human capital. These higher experience levels should, in turn, raise labor productivity. Unfortunately the failure of U.S. statistical agencies to systematically collect information on how people acquire skills in the workplace as they age limits our understanding of how declines in labor force participation may be offset by post-school investments in human capital.

In conclusion, if we have learned anything about the baby boom generation, it is that they have defied all efforts by demographers and economists to pigeonhole their labor market behavior. As they age, the boomers will continue to redefine hours of work, conditions of work, and where work is conducted. As a result, our efforts to try to model their labor market behavior going forward will constantly be challenged.

Notes

1. Congressional Budget Office, Cost Estimate. 2007. "Senate Amendment 1150 to S. 1348, the Comprehensive Immigration Reform Act of 2007." Available online at http://www.cbo.gov/ftpdocs/81xx/doc8179/SA1150_June4.pdf.

2. Bureau of Labor Statistics. 2007. "Foreign-Born Workers: Labor Force Characteristics in 2006," released April 25. Available online at http://www.bls.gov/news.release/pdf/forbrn.pdf.

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The Labor Supply of Older Americans