

July 23, 2010

Recessions, Wealth Destruction and the Timing of Retirement

Barry P. Bosworth and Gary Burtless
The Brookings Institution

Updated for the 12th Annual Joint Conference of the Retirement Research Consortium

August 5-6, 2009
Washington, D.C.

This research was supported by a grant from the U.S. Social Security Administration (SSA) as part of the Retirement Research Consortium (RRC). We are grateful to Maria Ramrath of Brookings for excellent research assistance. The findings and conclusions expressed are solely those of the author and do not represent the views of the Brookings Institution, SSA, any agency of the Federal Government or the Retirement Research Center at Boston College.

1. Introduction

Workers approaching the standard retirement age are almost certainly affected in the exact timing of their retirement by economic conditions. A tight labor market and rapidly rising wages can keep some workers in jobs they might have left in a weaker job market. The net effect of a recession or robust expansion on retirement is ambiguous, however. Since job finding in a recession is more difficult than it is in a growing economy, workers who lose their jobs when they are past age 62 may be induced to apply for social security benefits and shift to part-time employment or leave the workforce altogether. On the other hand, recessions can trigger steep drops in asset values. The resulting loss of wealth may encourage some older workers to postpone their retirements and remain in the workforce. In this study we examine both these channels of effect using aggregate level data, and we also explore the dimensions of what is meant by retirement using data at the individual level. A worker's decision to apply for a social security pension is sometimes treated as being synonymous with retirement. Some workers may plan for gradual retirement from full-time work, however, and combine social security benefit receipt with earnings from a full- or part-time job. Thus, the decision to apply for social security benefits may be an important part of the retirement process, but it is an imperfect indicator of both employment status and retirement.

In this study, we evaluate the retirement decision using two different analytical approaches to assessing the impact of economic conditions on retirement. The first uses aggregate statistics to measure the response of older workers to variations in labor market conditions and household wealth holdings. In particular, we examine administrative data on new retired-worker benefit awards from the Social Security Administration (SSA) and information from household surveys about the labor force status of older workers within narrow age groups. We compare these measures of labor supply with each other and with aggregate statistics on labor market conditions, such as the unemployment rate for prime-age workers, and the trailing returns on a variety of financial assets. The aggregate measures are useful for identifying trends and breaks in asset returns and retirement behavior. They provide us with helpful indicators of the link between retirement trends, on the one hand, and business cycles and asset returns, on the other. However, the statistical power of aggregate level analysis is limited, since the reliance on economy-

wide averages obscures the diversity of individual responses to changing economic conditions. The limit on the number of observations also restricts the analysis to relatively simple models.

Our second approach relies on analysis of micro-census data from the Current Population Survey (CPS). This survey collects monthly information on the labor force status of individuals in a sample of about 60,000 households. The basic goal of the survey is to track the number of adults who are employed, unemployed, or out of the labor force. Respondents who are outside the workforce are also asked about the reason for their nonparticipation, and one possible response to this question is “retired.” The Annual Social and Economic Supplement (ASEC) to the CPS, conducted every March, obtains more detailed information about the prior year, including respondents’ work status, work hours, and income sources and income amounts during that calendar year. The interview rotation pattern of the CPS provides information for the same respondent in 8 months over a 16-month period. Respondents are interviewed for 4 successive months, rotated out of the sample for 8 months, and then interviewed in 4 additional months starting one year after the first interview. The 4-8-4 rotation pattern in theory produces a 75 percent overlap in the CPS sample interviewed in successive months and a 50 percent overlap in CPS respondents who are interviewed in the same month in two successive years. After allowing for attrition, one-third to one-half of the March ASEC respondents will provide two matched interviews in successive March surveys.¹

At the outset it is important to recognize the ambiguity involved in classifying workers as retired. The formula that determines social security payments may mean that the decision of when to apply for social security benefits can be complicated and may lead to benefit acceptance when people are still employed. After their 62nd birthday workers can apply for social security retired-worker benefits. If they claim a pension at 62 the monthly payment will be permanently reduced relative to what they would have received if they had delayed pension claiming until a later age. Furthermore, between age 62 and the full retirement age (currently 66) retirees are subject to an earnings test that reduces their annual benefit if their earnings exceed a certain threshold. In 2010 the early-retirement penalty for claiming an early pension at 62 was 25 percent of the benefit

¹ Procedures for matching respondents are outlined in Feng (2008) and Maderian and Lefgren (1999)

entitlement at age 66. Benefits are further reduced by 50 percent of a claimant's annual earnings above \$14,160. However, any benefits lost as a result of the application of the earnings test before the normal retirement age are effectively compensated with monthly benefit increases in later years. Since 2000 the earnings test has not applied to pensioners in years after they have attained the normal retirement age.²

In view of social security's liberal rules on benefit claiming and current earnings, it is unclear whether a person collecting retired-worker benefits is in fact retired. In the ASEC surveys for 2000-2009, 21 percent of workers aged 62-69 who reported receiving social security benefits in the previous year describe themselves as in the labor force in the March reference week. Among 62-69 year-olds who participate in two consecutive March surveys, 23 percent of those who report receiving social security benefits in year t-2 also report working more than 13 weeks in year t-1. That is, almost a quarter of the 62-69 year-old respondents who collected social security benefits in one calendar year reported substantial amounts of paid employment in the following calendar year. Of course, workers may be in the labor force and employed but still consider themselves to be retired. On the other hand, many people who collect retired-worker benefits may not think of themselves as retired. Finally, it is worth noting that some people past 62 who are eligible for retired-worker benefits may not claim a pension even though they consider themselves retired. Well informed retirees may make the rational financial choice of delaying application for social security benefits for several years after they have ceased working and attained the early entitlement age. For many retired workers, especially married men, it makes sense to delay benefit claiming, even after retirement, in order to maximize expected lifetime benefits to the retired worker and spouse (Webb and Sun 2009).

If a worker's retirement status is difficult to determine solely with social security administrative data, it is also hard to ascertain using information in the CPS. In the monthly household survey, older people who report themselves as being out of the workforce may be retired or they may be temporarily absent from the labor force as a

² While the reduction for early retirement is actuarially fair and ensures no added cost of early retirees to the system, it does raise the risk that early claimants will exhaust their other assets and fall below the poverty line in later years. The effects of the earnings test on the labor supply of older workers was recently examined in Engelhardt and Kumar (2006) and Loughran and Haider (2005).

result of poor health or discouraging job prospects. Only about two-thirds of older workers who report a change in status from employed in the previous calendar year to out of the workforce in March classify themselves as “retired” when they are asked the reason for their nonparticipation. In some previous studies, respondents who are out of the workforce in March after being in the labor force for more than 13 weeks in the previous year are classified as “retired” (Coile and Levine 2009). In the matched ASEC, however, about 30 percent of these retirees will reenter the workforce by the following March.

In section 2 below we examine SSA data on new benefit awards for retired workers. The information on new retired-worker awards offers the most direct and straightforward evidence on the influence of changes in economic conditions on individuals’ decision to replace or supplement market earnings with a government-provided pension. In the following section, we compare the SSA administrative records on new awards with the survey data on social security benefits provided by the CPS. This allows us to assess the quality of the survey information. In addition, the CPS data permit us to extend the analysis to look more directly at the implications of changing economic conditions on late-career labor supply. In section 4, we use aggregate time series analysis to measure the response of old-age labor supply to changes in labor market conditions and returns on assets that are likely to be part of the savings portfolios of workers nearing retirement.

2. New Benefit Awards

Figure 1 shows trends in new retired-worker benefit awards for years between 1970 and 2009.³ The number of new awards shows a strong upward trend, and there is a particularly large jump in 2008 and 2009, when the leading edge of the baby boom generation reached age 62. There are two important breaks in the data. The first occurred in 1985 and was due to changes in administrative reporting procedures. Before 1985 the age classification of new awards was based on a claimant’s age at the end of the year of the award, whereas in later years it was based on the age in the month of the award. Second, after 1984, the age distribution data were based on a one-percent sample

³ Total awards increased substantially in 2009, but the age-specific data for new awards are not yet publicly available.

of social security records. The post-1984 raw data on awards show a sharp rise in the number of awards at age 62 with a partial downward offset in awards at age 63. Another temporary jump in the rate of new awards occurred in 2000 and was due to the elimination of the earnings test for working beneficiaries once they attained the age of full benefit entitlement.

The awards data are strongly influenced by the growth in the number of insured workers who are eligible for retired-worker benefits. The proportion of male workers who are social-security insured by age 62 has exceeded 95 percent for several decades, but the fraction of insured women is still rising, climbing from about 65 percent in 1980 to an estimated 85 percent in 2010. In addition, the oldest members of the baby boom generation attained the early retirement age in 2008, producing a surge in the number of workers eligible for Old-Age Insurance (OAI) or retired-worker benefits. For both these reasons, the growth in the insured population has been substantial (see Figure 2). In the following analysis we scale the new awards data by the number of people of the same age in the insured population. In some analyses, the office of the Social Security Actuary has reported the data as a retirement rate (Motsiopoulos and Tucker, 2005). To perform this calculation analysts exclude from the denominator the number of insured persons who are already in benefit status (retired or disabled). However, we do not have access to these administrative data over a long enough time span to analyze new awards over a number of past business cycles. We therefore focus on benefit claiming rates in populations that include some insured workers who are already receiving benefits.

The ratio of new awards to the relevant insured population within major age categories is displayed in Figure 3. The shift toward earlier retirement is evident in the growth after 1970 in the number of new benefit awards to individuals age 62-64, shown in the top panel. Note also that there was an offsetting decline in the number of new awards to retired workers aged 65-69. The trend toward early benefit claiming has reversed in recent years. The number of new benefit awards to those over age 64 was flat after the mid 1980s, and it has been rising in recent years. Meanwhile, the proportion of the insured population age 62-64 applying for a retirement benefit declined from 22 to 17 percent between 2000 and 2007. These trends are at least partly due to the gradual increase in the full benefit claiming age, which increased from 65 to 66 starting in 2000.

Workers reaching age 62 in 2000 were the first ones affected by the rise in the age of entitlement for full benefits. As the full benefit claiming age rises, the financial penalty for early benefit claiming also increases, producing a smaller benefit for workers claiming pensions at the earliest pension claiming age. The lower panel of Figure 3 highlights the very high claiming rate for workers when they first become eligible for OAI benefits at age 62. However, early benefit claiming peaked in the early 1990s at 50 percent of the insured population, and it is currently below 40 percent. The trend away from early benefit claiming not only reflects the larger financial penalty for early claiming but also the gradual trend toward higher employment and labor force participation rates among the population past age 60 (see below).

When we examine data on new awards back to the early 1970s, we see claiming behavior in past recessions that is comparable to the recent experience. The unemployment rate of Americans between 25 and 54 doubled between 1973 and 1975, rising from 3.2 percent to 6.4 percent, and it increased from 4.2 percent to 8.0 percent between 1979 and 1983. There were more modest increases in the unemployment rate in 1991-1992 and 2001-2003. However, in Figure 3 we see little change in the proportion of the insured claiming benefits in those recession periods.

More formally, we have estimated a set of simple regressions that relate the administrative estimates of new award rates to the unemployment rate of 25-54 year-olds in the current and previous calendar years. The unemployment rate of prime-age workers provides the most straightforward indicator of the health of the labor market because it is comparatively unaffected by major swings in the age profile of the total workforce. We included a quadratic trend in the regression to capture the changed secular trends in the claiming rate, a shift term to account for the definitional changes after 1984, and a simple categorical variable to adjust for the elimination of the earnings test in 2000 for those over the full retirement age. The regression results are reported in Table 1. These confirm the visual impression from Figure 3 that there is little significant evidence of a cyclical component to the claiming data. The most straightforward indicator of earlier benefit claiming should appear in the results for new pensions awarded at age 62, the earliest age of pension claiming. The coefficient estimate implies there is only a very small and insignificant impact of the unemployment rate on age-62 benefit claims. A 1-

percentage-point increase in the jobless rate boosts the benefit-claiming rate at age 62 by just 0.25 percentage points, or 0.5 percent of the average claiming rate between 1971 and 2008. Even the 3.8-percentage-point increase in the unemployment rate that occurred during the 1980-1983 recessions is predicted to increase the age-62 claiming rate by less than 1 percentage point (or 2 percent of the 1971-2008 average claiming rate at age 62). The results at other ages are more mixed. There is a statistically significant response in the expected direction at age 63, but there is an unexpected negative effect for 64-year-old workers and for workers between 65 and 69.

These findings seem surprising. We would expect that the income loss associated with involuntary unemployment should push some older workers into applying for social security benefits early, even though early benefit claiming results in a permanent reduction in the monthly pension. Yet the SSA data on new awards do not show a noticeable impact of the business cycle on retired-worker claiming experience.

3. Survey and administrative measures of retirement ages

Compared with the administrative data published by the SSA, household surveys such as the CPS provide a much wider range of information about the context in which individuals make their retirement and labor supply decisions. It is not obvious, however, that the administrative and survey data capture the same phenomena. In this section we report on some tests aimed at showing the consistency of the various measures of retirement decisions in the CPS with the retirement trends shown in the administrative records.

In the monthly CPS, individuals answer questions about their labor supply in terms of employed, unemployed, or not in the labor force. For people who report that they are out of the labor force, interviewers also ask about the reasons for nonparticipation, and one listed response is that the person is retired. Thus, in theory it is possible to distinguish between a retiree and a discouraged worker who has temporarily withdrawn from the workforce. Unfortunately, the monthly labor force survey contains no information about whether respondents are currently receiving a social security pension. In the March (ASEC) survey, interviewers ask detailed questions about respondents' work histories and income in the previous year. In particular, respondents are asked about retirement benefits, including social security. We would expect

respondents to the March survey to be interviewed in two consecutive ASEC surveys, and it is possible to match their responses for the two years. Thus, for a matched subset of respondents to the March survey, it is possible to compare incomes in year t-1 and t-2 to identify those who appear to be new beneficiaries. (Year t is the calendar year in which the second ASEC survey takes place.)

We constructed three measures of change in labor market status that that might be expected to correspond to a new retirement. The first identifies as “retired” persons in the March survey who report being in the labor force more than 13 weeks during the previous calendar year but report that in the March reference week they are out of the labor force. The second definition of “retirees” identifies a subset of those classified as retirees under the first measure, namely, those who indicate they are “retired” when they are asked for the reason for their nonparticipation in the March reference week. Our third measure of newly retired workers uses the matched ASEC data to identify individuals who report no social security benefits in year t-2 but who report receiving social security payments in year t-1.

Estimates of the alternative measures of retirement are displayed in Figure 4. Panel A shows the average age profile of new retirees under the first two definitions of new retirees described above. The top line in the panel shows the age profile of retirees under the first definition; the lower line shows the age profile under the second, more restrictive definition, which classifies workers as new retirees only if they say the reason for nonparticipation is that they are “retired.” The age profiles are estimated by combining the March (ASEC) CPS samples for 2001-2009. Note that the age profile of new retirees under both definitions is broadly similar to that for social security awards. There are peaks in the retirement rate at ages 62 and 65, though these peaks are not as pronounced at age 62 when a little less than half of the social-security-insured population applies for a benefit award. A comparison of the retiree age profiles displayed in Panel A shows there is a substantial difference at younger ages between the proportion of the population that exits the workforce and the proportion that reports being retired. The gap between the two age profiles narrows considerably at older ages, which implies that a rising percentage of people who exit the work force probably consider their exit to be permanent. There is a substantial amount of discouraged worker effects at all ages, but

the proportion of exiting workers who might be classified as “discouraged” declines at ages after 62.⁴ Panel B shows the age profile of workers who are new retirees under our third definition, which classifies workers as newly retired in year t-1 if they receive social security benefits in that year but did not receive any social security in the previous calendar year (year t-2). As expected, we see a sharp increase in the percentage of the population that receives a new benefit award around age 62. The estimates of the age pattern are less precise than in the administrative data, but the percentage of people with new benefit awards is approximately 20 percent for people between 61 and 65. This percentage drops off sharply at ages past 65.

The time series pattern of retirement under alternative definitions is displayed in Panels C and D of Figure 4. In each case the retirement rate is expressed as a percentage of the population in the indicated age groups. Both the proportion of the aged population that is reported as exiting the workforce and the proportion that gives retirement as the reason for exit show a pattern of secular decline after 1980. There was, however, a pronounced upward shift in the percentage of exits that were reported as “retirements” between the 1980s and 1990s.⁵

Panel D shows the trend in new retirements under a definition that links retirement to social security benefit acceptance. The two alternative estimates of the time series trend reflect two different sources of information about the number of new social security recipients between ages 61 and 68 (where the respondent’s age is measured in the first survey year). The top line in the panel is based on estimates from matched ASEC household samples, as described above. The lower line is based on SSA’s administrative reports of the number of new retired-worker awards. The measure based on the matched ASEC samples seems broadly similar to the measure produced by administrative data. The number of new beneficiaries shown in the ASEC is higher than the number shown in administrative reports, but the difference reflects new disabled-worker beneficiaries (who are excluded from the SSA estimates) and an unknown

⁴ The number of workers exiting from the work force was a stable 2-3 percent of the population between ages 30 and 50, but the proportion of these who report they are retired is essentially zero.

⁵ The questionnaire was redesigned in 1993 in a way that altered the relative percentages of men and women reporting retirement, but the combined effect was a small reduction. The increase in the reported retirement rate in the late 1980s seems unrelated to any change in the survey.

number of dependent spouses, who are excluded from SSA's estimates but may be partially included in the estimates derived from the household survey. Both sets of estimates show a sharp increase in new benefit awards when the earnings test was changed in 2000. What is notable, however, is that neither the household survey measure nor the evidence from administrative records shows much sensitivity of the retirement rate to the business cycle. In this respect we interpret the evidence in Panel D to show a reasonably high degree of correspondence between the administrative records and the survey reports. Neither measure of the retirement rate shows much cyclical sensitivity. Taken as a whole, the evidence displayed in Figure 4 shows considerable divergence in retirement patterns depending on the concept of retirement that is used. Retirement rates appear higher, especially in late middle age, if retirement is solely based on a respondent's current labor force status. If we do not classify workers as "retired" until they describe themselves as retired (rather than simply out of the labor force), retirement rates appear considerably lower at those ages. Social security benefit acceptance is an even more ambiguous indicator of retirement. Although the age pattern of benefit acceptance broadly mirrors the age profile of labor force withdrawal, the correspondence is far from exact. In all of our analysis so far and under a variety of concepts of retirement, however, we see little evidence that the rate of retirement is strongly influenced by the business cycle.

4. Impact of unemployment and investment returns on labor supply at older ages

Trends in old-age labor supply have been the subject of considerable empirical study (Quinn and Burkhauser 1990; Burtless and Quinn 2001; Burtless 2008; Gustman and Steinmeier 2009). During most of the twentieth century labor force participation rates at ages past 60 declined. This long term trend ceased and then reversed direction in the 1990s. Participation rates at older ages have been rising in recent years, among both men and women. Analysis of labor force trends before the mid-1970s is based on data in decennial census records and special surveys targeted on the aged, since detailed monthly tabulations of the labor force status of older Americans were not published by the Bureau of Labor Statistics until 1976.

The Bureau reports the monthly labor force status of adult Americans in 5-year age groups up through age 74. In addition, it publishes additional tabulations for broader

age groups and for 60-61 year-olds and 62-64 year-olds. Separate statistics on the latter two groups are published because of the obvious importance of social security's early entitlement age (62) for workers' retirement behavior. Researchers with access to the public-use CPS files can analyze work patterns in even narrower age groups, though the limited size of the monthly CPS samples reduces the precision of monthly statistics for very small age groups.

Trends in participation rates at older ages are displayed in Figures 5 and 6. Participation rates among women past age 60 began to rise after the mid-1980s, and they have increased considerably since that time (Figure 5). Among 65-69 year-old women, participation rates have approximately doubled since 1985, and they have increased about 16 percentage points among women between 60 and 64. The increase in participation rates among 55-59 year-old women was even larger than among older women. Moreover, the rise of participation in this age group began a little earlier than it did among women past 60. In addition to the monthly estimates of female labor force participation, Figure 5 also displays the smoothed trend in participation where the trend line is estimated as a third order polynomial function of time. It is hard to see much evidence in the chart that deviations from the trend lines are systematic or especially large during recessionary periods.

The trends in older males' participation rates are displayed in Figure 6. The historical data show a strong pattern of participation decline during the late 1970s and early 1980s, continuing a fall in participation at these ages that began several decades earlier. There was a rebound in older men's participation starting sometime in the 1990s. The rebound is particularly noticeable in the two older age groups. The participation rate of 65-69 year-olds has increased about 12 percentage points since 1990, and the participation rate of 60-64 year-old men rose about 8 percentage points after the mid-1990s. Among men between 55 and 59 there has been a slight increase in participation rates in the past decade.

In the remainder of this section we analyze the aggregate determinants of labor force status at older ages using monthly statistics on labor force participation rates and the employment-population ratio for the period 1976-2010. We are interested in two main factors that affect the attractiveness of labor force exit. The first is the state of labor

market. It seems plausible to expect that low-unemployment job markets will tend to keep older workers in the labor force and entice labor force dropouts back into the active workforce. We measure the state of the job market using the unemployment rate of 25-54 year-old adults (seasonally adjusted). One advantage of this variable is that it only reflects the labor force choices of nonaged adults, that is, people who are too young to be included in any of the age groups we analyze. Besides the prime-age unemployment rate, our specification includes indicators of the returns savers obtain on three kinds of assets – stocks, long duration U.S. government bonds, and owner-occupied homes. The return on stocks is measured using the total real annual rate of return on stocks in the Standard and Poors 500 index. The total return reflects the returns provided by reinvested dividends plus stock price changes. The nominal return is deflated by the CPI-U to derive the real return on stock investment. Bond returns are calculated based on the returns of a 10-year constant maturity portfolio of U.S. government bonds. The return consists of reinvested interest payments and price appreciation or depreciation on the bonds in the portfolio. The total nominal return is converted to real returns using the CPI-U.

To calculate the rate of real appreciation of owner-occupied homes we use the Federal Housing Finance Agency’s house price index. According to the FHFA’s documentation, the index “... measures average price changes in repeat sales or refinancings on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac.” [<http://www.fhfa.gov/Default.aspx?Page=81>] Thus, the index attempts to measure the price increase or decline of typical homes, holding constant the quality of the homes. This index begins in 1975. For house appreciation in years before 1975 we relied on a discontinued BLS price series known as the Home Purchase Index, which was once a component of the CPI. Like the FHFA index, the Home Purchase Index attempted to measure house appreciation holding fixed the quality of dwellings. To calculate the real rate of house appreciation, we deflated the nominal house price index numbers using the CPI-U. (The modern version of the CPI-U does not use the House Purchase Index. Shelter costs are now measured in the CPI-U using the concept of rental equivalence.) To be sure, the price appreciation of a house may offer a poor approximation of the real return that homeowners derive from ownership. Most

Americans who own a home also have a mortgage. If house prices are rising, leveraged owners will derive bigger returns on their home investment than implied by the percentage rise in house prices. If house prices are falling, they will experience larger proportional losses than implied by the price decline. However, older homeowners have smaller mortgages than average, so the rate of price appreciation may offer a better approximation of their returns.

Asset returns are important to workers nearing retirement if they have accumulated a substantial amount of savings to finance their retirement. A sharp rise in asset prices near the end of a worker's career can substantially increase the worker's retirement wealth, permitting an earlier retirement or a higher flow of consumption in old age. Workers with little retirement savings should be less affected by changes in asset returns. To examine the influence of asset returns on labor force behavior we tried a variety of definitions of an asset's trailing returns. The definition that produced the largest variance in returns focused on trailing returns over the previous twelve months. It is unclear, however, whether most retirement savers monitor their savings often enough to react to a rise or fall in returns that lasts only one year. We also experimented with 3-year and 5-year trailing returns. These definitions show less variability than one-year returns, but the 1976-2010 period still saw wide swings in the real returns on the three asset classes we examined.

The regression results reported below show our estimates of a basic aggregate-level model of labor force participation and the employment-population ratio. In all our specifications we include second- or third-order polynomial time trends to reflect determinants of labor market behavior that were left out of our model. The time trends are always highly significant, as should be evident from casual inspection of Figures 5 and 6. (The coefficients on the trend variables are not reported in Tables 2 and 3 below.) In addition, the basic specification includes the prime-age unemployment rate in the current month and in three past months (3, 6, and 12 months before the current period). This specification allows a flexible response to changes in the unemployment rate. In the results reported below we show coefficient estimates for three asset classes. The most parsimonious specification includes only the trailing stock market return. More elaborate specifications show the effects of adding bond returns and house-price appreciation to the

model. Preliminary inspection of the results showed significant auto-correlation in the error terms. To address this problem we estimated a first-order auto-regressive model. The coefficient estimates for women are displayed in Table 2, while results for men are shown in Table 3. Columns 1, 2, and 3 in the Tables show coefficients for models that predict the monthly labor force participation rate. The results in columns 4, 5, and 6 show coefficient estimates for models that predict the employment-population ratio. We only report results for three age groups – 55-59 year-olds (at the top of the table), 60-64 year-olds (in the middle), and 65-69 year-olds (on the bottom).

The estimates for women show very little evidence that the prime-age unemployment rate affects the labor force participation decisions of older women (see the results displayed in Table 2 under columns 1, 2, and 3). The F statistic for including the four unemployment variables in the model is displayed immediately below the sum of the estimated coefficients on the four unemployment rate variables. In spite of the flexibility in our specification of the potential response of participation rates to the contemporaneous and lagged values of unemployment, the unemployment terms are never jointly significant. Moreover, the sum of the coefficients on the current and lagged unemployment terms is always close to zero. The prime-age unemployment rate is a significant determinant of the employment-population ratio of women who are between 55 and 59 (see the results reported in columns 4, 5, and 6 of Table 2). However, this finding simply confirms that employment and unemployment rates in this group of women are responsive to common shocks in the labor market that also affect the unemployment rate of prime-age workers. The actual labor supply of 55-59 year-old women is responsive to the strength and weakness of the overall labor market, but their decision to participate in the labor force shows little detectable influence of labor market tightness. For women in the two older age groups the unemployment rate variables do not have a significant impact on the employment-population ratio, although in this case the effects clearly have the anticipated sign. In the case of women in the oldest age group shown, 65-69, the point estimates imply a 1-percentage-point increase in the prime-age unemployment rate would reduce participation rates by between 0.15 and 0.24 percentage points, or about 1.0 to 1.5 percent of the average participation rate in this age group. The effect is not small, but it is imprecisely determined by the data.

The effect of the prime-age unemployment rate on the labor force participation decisions of older men is larger and more significant than it is in the case of older women (see the results in columns 1, 2, and 3 of Table 3), although this is mainly true for men past the age of 60. The participation rate of men who are between 55 and 59 shows little responsiveness to the unemployment rate. For the two older age groups, however, the effects are larger and more precisely determined. Among 60-64 year-old men the participation rate drops between 0.16 and 0.32 percentage points in response to a 1-point rise in the jobless rate. Among 65-69 year-old men, the estimated drop ranges between 0.23 and 0.49 percentage points depending on the other variables included in the model. In the recent recession the prime-age unemployment rate increased 4.6 percentage points, rising from an average of 3.7 percent in 2007 to 8.3 percent in 2009. The results in Table 3 imply that this increase could have reduced the labor force participation rate by 0.7 to 1.5 percentage points among 60-64 year-old men and by 1.0 to 2.3 percentage points among 65-69 year-old men. In estimates not shown we find that the responsiveness is similar for men slightly younger and slightly older than the social security early entitlement age. That is, the labor force participation rates of men 60-61 move about the same in response to a jump in the unemployment rate as the participation rates of 62-64 year-olds.

Table 3 also shows, not surprisingly, that the actual employment rates of older men are significantly affected by changes in the prime-age unemployment rate. These effects are generally larger than the effects on labor force participation. We find for example that the change in the labor force participation rate is only about 10 percent of the change in the employment-population ratio among men between 55 and 59. This percentage rises in older age groups. Among 60-64 year-old men the change in the labor force participation rate is between 30 percent and 40 percent of the estimated change in the employment-population rate. Among 65-69 year-olds the comparable percentage is 80 percent to 100 percent. In other words virtually the entire estimated response in the group's employment rate is also reflected as a drop in its labor force participation. A weak job market depresses the employment rate of this age group, and nearly all of the employment-rate reduction is reflected as a drop in the group's participation rate.

The other results in Tables 2 and 3 show our estimates of the impact of trailing

asset returns on the labor force participation rates and employment-population ratios of older Americans. We show the results based on trailing asset returns over the previous 36 months. Our estimates when we use trailing returns over a 60-month period are qualitatively and quantitatively similar. However, the results when using 12-trailing returns differed noticeably from those using a longer return horizon. To keep the discussion simple, we focus solely on results based on the 3-year horizon. The estimates for women suggest that both labor force participation and the employment-population ratio are modestly but statistically significantly sensitive to trailing stock market returns. A higher stock return in the most recent 3 years tends to reduce older women's participation and employment. The effect of higher government bond returns on participation and employment probably has the same sign, but it is imprecisely estimated in our data. The effects of stock returns on behavior are proportionately more important for women in the two older age groups. Thus, the impacts of both stock and bond returns on women's labor force status are in the expected direction, but the effect is not large in comparison with the variation in women's work behavior over this period. For example, a 10-percent (0.7-percentage-point) increase in the trailing real return on stocks would only reduce 55-59 year-olds' participation rate by 0.02 percentage points, or about 0.04 percent of the average participation rate in the estimation period. Even a one-standard-deviation (10-percentage-point) increase in stock returns would only have the effect of reducing 55-59 year-olds' participation rate by 0.3 percentage points (about 0.5 percent of the average labor force participation rate in this age group). The proportional effects (though not the absolute effects) on the participation and employment rates are larger for women in the older age groups. This may either mean that women are more sensitive to wealth changes as they grow older or that stock and bond holdings are larger and more important among women who remain in the workforce after age 60 or 65.

The estimated effects of house price appreciation on women's participation and employment are occasionally significant and often puzzling. Among women under 60 the effect of recent house appreciation is to reduce modestly the participation rate and employment-population ratio. A 1-standard-deviation (2.8-percentage-point) increase in the rate of house appreciation would induce a 0.3 percentage point decline in the participation rate and a somewhat smaller drop in the employment-population ratio. For

women who are over age 60 increasing home values are estimated to have the opposite effect on participation and employment. Instead of withdrawing from the work force when house prices rise, the coefficient estimates suggest women boost their participation and employment rates. In any event, the estimated effect on behavior is small in comparison with the variation in participation and employment rates over the period covered by the data. In sum, most of the evidence of the influence of recent asset returns on labor market behavior shows effects that are in the expected direction but that are quantitatively small for women.

The estimates for men show a different pattern of effects (Table 3). None of the results for 55-59 year-old men show statistically significant or meaningfully large effects of real asset returns on participation rates or retirement. The estimated effects of increased stock and bond returns on older men are usually in the expected direction, but similar to the results for women they imply quantitatively small responses to increases or reductions in the trailing real return. For example, a 1-standard-deviation (10-percentage-point) increase in the real return on stocks is predicted to reduce the labor force participation rate of 60-64 year-old and 65-69 year-old men by a little less than 0.2 percentage points. This represents about 0.3 percent of the average participation rate of 60-64 year-old men and 0.7 percent of the participation rate of men between 65 and 69. The imprecisely estimated effects have the anticipated sign, but they are small in relation the typical variability of the participation rate.

As in the case of women, the estimated response of older men to appreciation in house prices presents a puzzle. Instead of encouraging older workers to leave the work force and employment at an earlier age, which would be expected, a jump in real house prices is associated with a rise in both participation and employment rates. In the case of 60-64 year-old men, a 1-standard-deviation (2.8-percentage-point) increase in average house appreciation is predicted to increase the participation rate by 0.26 percentage points (about 0.5 percent of the average participation rate in the estimation period). The impact on the employment-population rate of this group is even bigger. The unexpected effect is larger still among men between 65 and 69. The 1-standard-deviation increase in home price appreciation causes the participation rate in this age group to rise by 0.55 percentage points and the employment rate to increase 0.63 percentage points. In view of

the fact that the typical participation and employment rates in this population average less than 30 percent, the size of these predicted effects is notable. One possible explanation for the puzzling sign of the effect is that rising home prices not only make some older workers wealthier they also make it more costly for retirees to move and for aged renters to pay for shelter. This may deter some of them from leaving their jobs or the labor force.

5. Summary

In sum, the findings in the previous section suggest that, with few exceptions, the effects of trailing real returns on participation and employment rates are typically quite modest, even when the effects are statistically significant and precisely estimated. Some of the most consistent results show small effects of trailing stock and bond returns on women's and older men's participation and employment rates. As most economists would anticipate, a higher real return on assets, which tends to boost the value of retirement savings, typically pushes down the labor force participation and employment rates of older men and women. The size of this effect, however, is quantitatively very modest. Our results uncovered a puzzling response of participation and employment rates to higher home prices, and this puzzle is apparent both among women and among men older than 60. Unexpectedly, our findings suggest that increasing home prices tend to boost participation and employment rates among the elderly. Except among men past age 65, however, the size of this effect is small compared with the variation in participation and employment rates we see during the period covered by our data. Many of the effects of asset returns on labor supply behavior conform with the expectations of economists and ordinary citizens. The size of these effects, however, is quantitatively small.

We find essentially no evidence that fluctuations in the prime-age unemployment rate have an important or systematic effect on the labor force participation rates of women past age 55. There is clear evidence of an impact of higher unemployment rates on the employment-population ratio of 55-59 year-old women, but this effect does not translate into a noticeable impact on the level of labor force participation among these women. In contrast, the prime-age unemployment rate has a significant, though not a particularly large, effect on the participation rate of older men. For men between 55 and

59, there is little evidence that weak job markets drive large numbers of men from the work force. There is, of course, good evidence that a weak job market reduces the employment rates of older men. Just as men in younger age groups lose their jobs and suffer high unemployment when the job market is weak, so, too, do men in older age groups. At ages past 60 and especially past 65, the reduced employment levels caused by a weak job market very quickly translate into reduced labor force participation rates among older men.

The findings from our analysis of labor force participation and employment rates conform broadly with the findings in previous parts of the paper. Our analysis of new social security claims uncovered very little responsiveness of pension awards to the business cycle. Although this analysis could certainly be improved with better administrative data, a big effect of the business cycle on retired-worker benefit awards should certainly be visible in the data we analyzed. Our conclusion, then, is that a weak job market and plummeting asset returns almost certainly have effects in the expected direction on labor force exit. Those effects, however, are small in relation to variations we have seen in labor force participation, retirement rates, and pension claiming behavior over the past three decades.

References

- Burtless, Gary. 2008. "The Rising Age of Retirement in Industrial Countries." Working Paper 2008-6 (Chestnut Hill, MA: Retirement Research Center at Boston College).
- Burtless, Gary, and Joseph F. Quinn. 2001. "Retirement Trends and Policies to Encourage Work among Older Americans," in P.P. Budetti, R.V. Burkhauser, J.M. Gregory, and H.A. Hunt, eds., *Ensuring Health and Income Security for an Aging Workforce* (Kalamazoo, MI: Upjohn).
- Chan, Sewin and Ann Huff Stevens. 2004. "How Does Job Loss Affect the Timing of Retirement?" *Contributions to Economic Analysis & Policy*, Vol. 3, No. 1, article 5.
- Coile, Courtney and Phillip Levine. 2009. "The Market Crash and Mass Layoffs: How the Current Economic Crisis May Affect Retirement," NBER Working Paper 15395.
- Engelhardt, Gary, and Anil Kumar. 2006. "The Repeal of the Retirement Earnings Test and the Labor Supply of Older Men" (Working Paper 2007-1, Center for Retirement Research, Boston College, Chestnut Hill, MA, December), available at http://crr.bc.edu/working_papers/the_repeal_of_the_retirement_earnings_test_and_the_labor_supply_of_olde.html (accessed July 14, 2008).
- Feng, Shuaizhang. 2008. "Longitudinal Matching of Recent Current Population Surveys: Methods, Non-Matches and Mismatches," *Journal of Economic and Social Measurement* 33: 241–52.
- Gustman, Alan L., and Thomas L. Steinmeier. 2009. "How Changes in Social Security Affect Recent Retirement Trends." *Research on Aging*, 31(2):261.
- Gustman, Alan, Thomas Steinmeier, and Nahid Tabatabai. 2010. "What the Stock Market Decline Means for the Financial Security and Retirement Choices of the Near-Retirement Population," *Journal of Economic Perspectives*, Vol 24, No. 1 (Winter): 161-182.
- Hurd, Michael D., Monika Reti, Susann Rohwedder. 2009. "The Effect of Large Capital Gains or Losses on Retirement", in David Wise (ed.), *Developments in the Economics of Aging*. Chicago: University of Chicago Press.
- Loughran, David, and Steven Haider. 2005. "Do the Elderly Respond to Taxes on Earnings? Evidence from the Social Security Retirement Earnings Test." RAND Corporation working paper 223, Santa Monica, CA, January 2005), available at: www.rand.org/pubs/working_papers/WR223/index.html.
- Madrian, Brigitte, and Lars John Lefgren. 1999. "A Note on Longitudinally Matching Current Population Survey (CPS) Respondents." National Bureau of Economic Research, technical working paper t0247 (November)..
- Motsiopoulos, Chris, and Richard B. Tucker. 2005. *Short-Range Actuarial Projections of the Old-Age, Survivors, and Disability Insurance Program, 2005*, actuarial study no.119, Office of the Chief Actuary, Social Security Administration.
- Quinn, Joseph F. and Richard V. Burkhauser (1990), "Work and Retirement", in: R.H. Binstock and L.K. George (eds.), *Handbook of Aging and the Social Sciences*, San Diego: Academic Press.
- Sass, Stephen, Courtney Monk, and Kelly Haverstick. 2010. "Workers' Response to the Market Crash: Save More, Work More? Research Brief, Center for Retirement Research at Boston College Number 10-3 (February).

Webb, Anthony, and Wei Sun. 2009. "How Much Do Households Really Lose By Claiming Social Security at Age 62?" Working Paper 2009-11 (Chestnut Hill, MA: Center for Retirement Research at Boston College).

Table 1. Impact of the Unemployment Rate on Social Security Retired-Worker Awards

	Total	Age 62	Age 63	Age 64	Age 62-64	Age 65 to 69
Coefficient on Unemployment in Year t	0.101 (0.14)	0.251 (0.23)	0.300** (0.00)	0.266 (0.20)	0.265** (0.04)	-0.069 (0.40)
Coefficient on Unemployment in Year t-1	-0.089 (0.18)	-0.158 (0.44)	0.050 (0.55)	-0.411** (0.05)	-0.175 (0.16)	-0.129 (0.11)
F-Statistic Significance of F-Statistic	1.20 (0.31)	0.77 (0.47)	17.44 (0.00)	2.20 (0.13)	2.27 (0.12)	5.88** (0.01)
Number of Observations	38	38	38	38	38	38

Notes: The dependent variable is new retired-worker awards as a percent of the insured population from 1971-2008. The unemployment rate used in the regression is that of the population between 25 and 54. Aside from the unemployment rate and lagged unemployment rate, the regression also includes a quadratic trend, a categorical variable for the elimination of the earnings test in 2000, and a shift term for 1984 and earlier years to account for a change in how the new awards were recorded. The numbers in parentheses are p-values.

Table 2. Regression Estimates for 55-69 Year-Old Women

	Labor Force Participation			Employment-Population Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Women age 55-59</i>						
UR	-0.0622 (0.198)	-0.0523 (0.197)	-0.160 (0.206)	-0.240 (0.200)	-0.232 (0.199)	-0.293 (0.209)
UR(t-3)	-0.189 (0.238)	-0.199 (0.238)	-0.230 (0.239)	-0.238 (0.242)	-0.248 (0.242)	-0.265 (0.243)
UR(t-6)	0.120 (0.222)	0.130 (0.222)	0.120 (0.221)	0.048 (0.225)	0.058 (0.225)	0.054 (0.225)
UR(t-12)	0.0418 (0.165)	0.1000 (0.168)	0.0933 (0.166)	0.0007 (0.166)	0.0580 (0.169)	0.0541 (0.168)
<i>Sum of UR Coefficients</i>	-0.0894	-0.0213	-0.1767	-0.4298	-0.3645	-0.4499
<i>F-Stat on UR</i>	0.445	0.483	1.003	3.430	2.965	2.781
<i>P-Value of the F</i>	0.776	0.748	0.406	0.009	0.020	0.027
S&P, real return	-0.0302 ** (0.0119)	-0.0256 ** (0.0121)	-0.0282 ** (0.0120)	-0.0205 * (0.0119)	-0.0162 (0.0121)	-0.0178 (0.0121)
Gov't Bond Return		-0.0322 (0.0205)	-0.0186 (0.0214)		-0.0312 (0.0203)	-0.0239 (0.0217)
House Price Change			-0.0992 * (0.0587)			-0.0537 (0.0592)
R-Squared	0.881	0.884	0.894	0.879	0.884	0.888
ρ	0.732	0.728	0.715	0.723	0.717	0.711
<i>Women age 60-64</i>						
UR	-0.180 (0.192)	-0.180 (0.192)	-0.059 (0.204)	-0.218 (0.197)	-0.218 (0.197)	-0.083 (0.207)
UR(t-3)	0.1340 (0.244)	0.1340 (0.245)	0.1580 (0.245)	-0.0741 (0.246)	-0.0737 (0.247)	-0.0399 (0.247)
UR(t-6)	0.1880 (0.223)	0.1880 (0.224)	0.1780 (0.223)	0.1590 (0.227)	0.1590 (0.227)	0.1530 (0.226)
UR(t-12)	-0.1160 (0.149)	-0.1200 (0.154)	-0.1050 (0.152)	-0.0696 (0.156)	-0.0726 (0.161)	-0.0573 (0.158)
<i>Sum of UR Coefficients</i>	0.0260	0.0220	0.1716	-0.2027	-0.2053	-0.0271
<i>F-Stat on UR</i>	0.522	0.512	0.990	1.045	1.019	0.138
<i>P-Value of the F</i>	0.719	0.727	0.413	0.384	0.397	0.968
S&P, real return	-0.0441 *** (0.0104)	-0.0443 *** (0.0106)	-0.0411 *** (0.0107)	-0.0372 *** (0.0110)	-0.0374 *** (0.0113)	-0.0340 *** (0.0112)
Gov't Bond Return		0.0015 (0.0175)	-0.0123 (0.0188)		0.0014 (0.0187)	-0.0156 (0.0197)
House Price Change			0.0883 * (0.0500)			0.1090 ** (0.0528)
R-Squared	0.898	0.897	0.903	0.87	0.869	0.88
ρ	0.639	0.64	0.63	0.668	0.668	0.653
<i>Women age 65-69</i>						
UR	-0.205 (0.175)	-0.223 (0.173)	-0.203 (0.185)	-0.191 (0.174)	-0.205 (0.173)	-0.165 (0.184)
UR(t-3)	0.2850 (0.223)	0.2770 (0.224)	0.2800 (0.224)	0.2870 (0.218)	0.2780 (0.218)	0.2870 (0.219)
UR(t-6)	-0.134 (0.204)	-0.120 (0.203)	-0.121 (0.203)	-0.2720 (0.201)	-0.2590 (0.200)	-0.2590 (0.200)
UR(t-12)	-0.133 (0.135)	-0.075 (0.136)	-0.073 (0.136)	-0.062 (0.139)	-0.018 (0.140)	-0.014 (0.139)
<i>Sum of UR Coefficients</i>	-0.187	-0.141	-0.117	-0.238	-0.204	-0.151
<i>F-Stat on UR</i>	1.325	0.877	0.617	1.975	1.600	0.947
<i>P-Value of F-Stat</i>	0.260	0.478	0.651	0.098	0.174	0.436
S&P, real return	-0.0305 *** (0.0094)	-0.0292 *** (0.0092)	-0.0286 *** (0.0094)	-0.0251 ** (0.0097)	-0.0242 ** (0.0097)	-0.0232 ** (0.0098)
Gov't Bond Return		-0.0248 (0.0150)	-0.0269 (0.0165)		-0.0198 (0.0160)	-0.0251 (0.0173)
House Price Change			0.0135 (0.0438)			0.0324 (0.0463)
R-Squared	0.845	0.863	0.863	0.807	0.825	0.828
ρ	0.633	0.608	0.608	0.67	0.65	0.647

Note: Monthly data cover the period from June 1976 through March 2010.

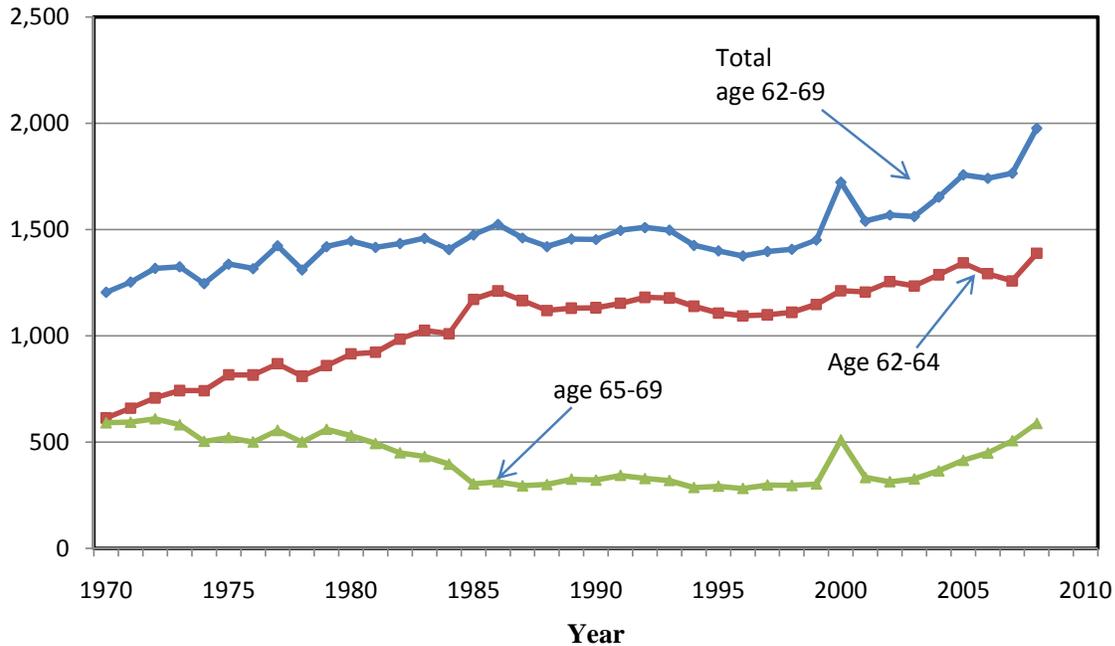
Table 3. Regression Estimates for 55-69 Year-Old Men

	Labor Force Participation			Employment-Population Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Men age 55-59</i>						
UR	0.0273 (0.151)	0.0315 (0.151)	-0.0248 (0.161)	-0.3860 ** (0.171)	-0.3790 ** (0.171)	-0.4130 ** (0.184)
UR(t-3)	-0.0847 (0.186)	-0.0876 (0.187)	-0.1060 (0.188)	-0.2650 (0.218)	-0.2730 (0.218)	-0.2820 (0.219)
UR(t-6)	0.0883 (0.174)	0.0921 (0.175)	0.0860 (0.175)	0.0468 (0.202)	0.0551 (0.202)	0.0551 (0.202)
UR(t-12)	-0.0795 (0.132)	-0.0629 (0.135)	-0.0730 (0.134)	-0.1780 (0.144)	-0.1380 (0.147)	-0.1410 (0.147)
<i>Sum of UR Coefficients</i>	-0.0486	-0.0269	-0.1178	-0.7822	-0.7349	-0.7809
<i>F-Stat on UR</i>	0.182	0.130	0.300	21.410 ***	17.690 ***	9.121 ***
<i>P-Value of the F</i>	0.947	0.971	0.878	0.000	0.000	0.000
S&P, real return	-0.0067 (0.0094)	-0.0053 (0.0097)	-0.0065 (0.0097)	0.0056 (0.0101)	0.0088 (0.0103)	0.0079 (0.0105)
Gov't Bond Return		-0.0097 (0.0168)	-0.0034 (0.0176)		-0.0211 (0.0175)	-0.0177 (0.0188)
House Price Change			-0.0504 (0.0481)			-0.0251 (0.0503)
R-Squared	0.389	0.391	0.406	0.467	0.477	0.48
ρ	0.748	0.748	0.741	0.699	0.695	0.693
<i>Men age 60-64</i>						
UR	0.282 (0.198)	0.279 (0.198)	0.400 * (0.212)	0.112 (0.206)	0.115 (0.207)	0.290 (0.222)
UR(t-3)	-0.4860 * (0.251)	-0.4830 * (0.251)	-0.4480 * (0.252)	-0.6750 ** (0.268)	-0.6780 ** (0.268)	-0.6320 ** (0.268)
UR(t-6)	0.0988 (0.233)	0.0975 (0.233)	0.1010 (0.233)	0.0293 (0.247)	0.0305 (0.247)	0.0271 (0.246)
UR(t-12)	-0.2050 (0.168)	-0.2180 (0.172)	-0.2110 (0.171)	-0.2730 (0.170)	-0.2580 (0.176)	-0.2550 (0.173)
<i>Sum of UR Coefficients</i>	-0.3102	-0.3245	-0.1580	-0.8067	-0.7905	-0.5699
<i>F-Stat on UR</i>	3.404 ***	3.197 **	2.123 *	18.360 ***	15.090 ***	5.966 ***
<i>P-Value of the F</i>	0.009	0.013	0.077	0.000	0.000	0.000
S&P, real return	-0.0183 (0.0118)	-0.0192 (0.0121)	-0.0159 (0.0122)	-0.0111 (0.0117)	-0.0101 (0.0121)	-0.0052 (0.0121)
Gov't Bond Return		0.0055 (0.0206)	-0.0066 (0.0220)		-0.0061 (0.0204)	-0.0226 (0.0216)
House Price Change			0.0917 (0.0591)			0.1220 ** (0.0573)
R-Squared	0.554	0.558	0.565	0.58	0.578	0.599
ρ	0.708	0.706	0.703	0.668	0.67	0.659
<i>Men age 65-69</i>						
UR	-0.214 (0.220)	-0.216 (0.219)	-0.044 (0.235)	-0.248 (0.225)	-0.251 (0.223)	-0.005 (0.236)
UR(t-3)	0.1200 (0.294)	0.1170 (0.295)	0.1520 (0.295)	-0.0504 (0.296)	-0.0567 (0.296)	-0.0095 (0.296)
UR(t-6)	-0.170 (0.268)	-0.160 (0.268)	-0.151 (0.266)	-0.0952 (0.271)	-0.0772 (0.271)	-0.0533 (0.267)
UR(t-12)	-0.226 (0.175)	-0.187 (0.180)	-0.184 (0.174)	-0.201 (0.182)	-0.150 (0.185)	-0.147 (0.174)
<i>Sum of UR Coefficients</i>	-0.490	-0.446	-0.227	-0.595	-0.535	-0.215
<i>F-Stat on UR</i>	6.302 ***	4.509 ***	1.078	8.309 ***	6.256 ***	0.757
<i>P-Value of F-Stat</i>	0.000	0.001	0.367	0.000	0.000	0.554
S&P, real return	-0.0288 ** (0.0118)	-0.0266 ** (0.0120)	-0.0221 * (0.0118)	-0.0211 * (0.0124)	-0.0184 (0.0125)	-0.0128 (0.0118)
Gov't Bond Return		-0.0194 (0.0200)	-0.0388 * (0.0208)		-0.0269 (0.0210)	-0.0563 *** (0.0208)
House Price Change			0.1180 ** (0.0547)			0.1710 *** (0.0547)
R-Squared	0.716	0.724	0.753	0.644	0.66	0.722
ρ	0.621	0.614	0.587	0.648	0.636	0.585

Note: Monthly data cover the period from June 1976 through March 2010.

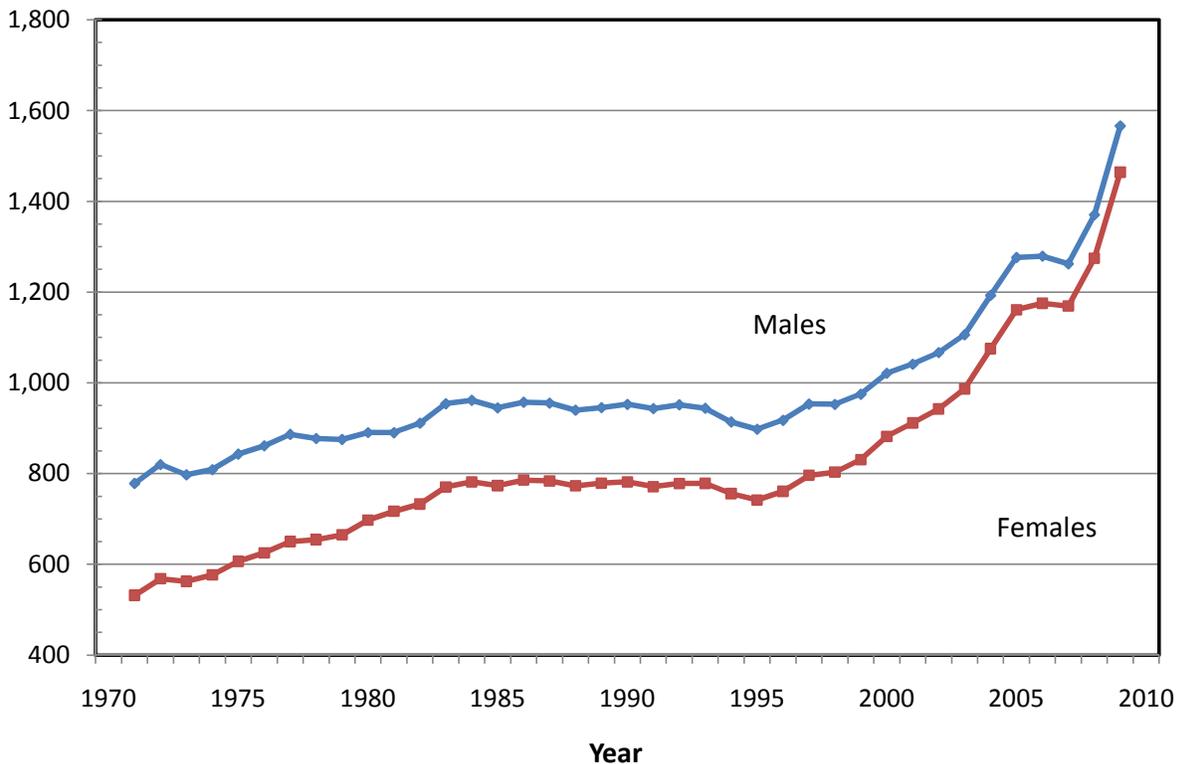
Figure 1. Social Security Retired-Worker Benefit Awards, 1970-2009

(thousands)



Source: Annual Statistical Supplement to the Social Security Bulletin , 2009, table 6.B5 and prior issues.

Figure 2. Estimated Number of Persons Insured for OASI Benefits at Age 62, 1971-2010 (thousands)

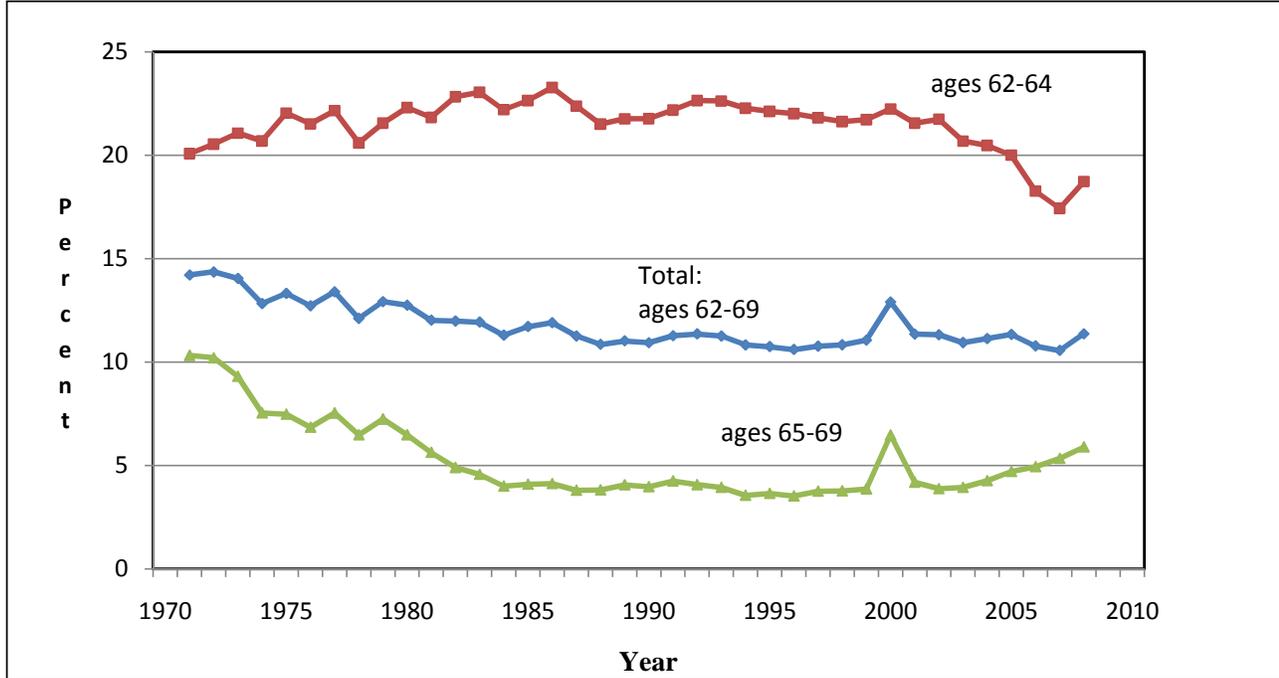


Source: Computed by the authors from data of the Social Security Administration and the Census Bureau.

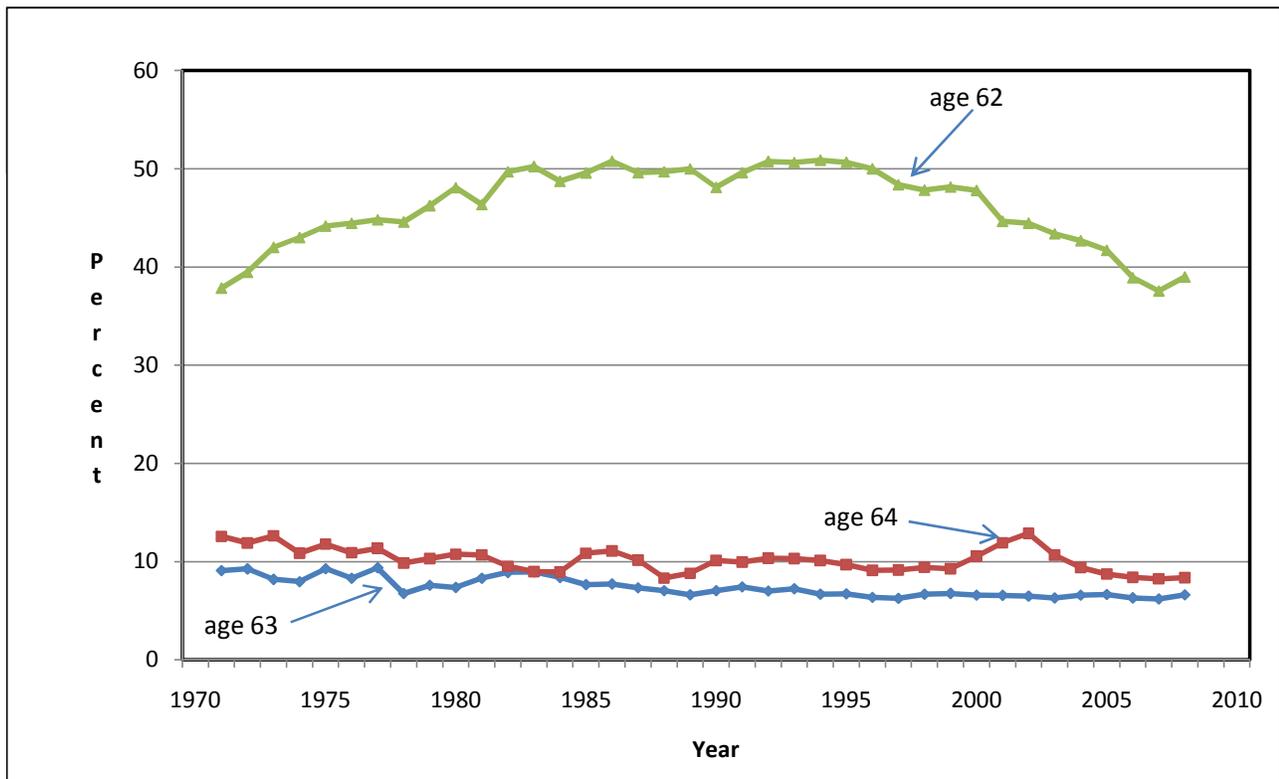
Figure 3. Retired-Worker Benefit Awards by age, 1970-2009

Percent of insured population at indicated year of age

Panel A

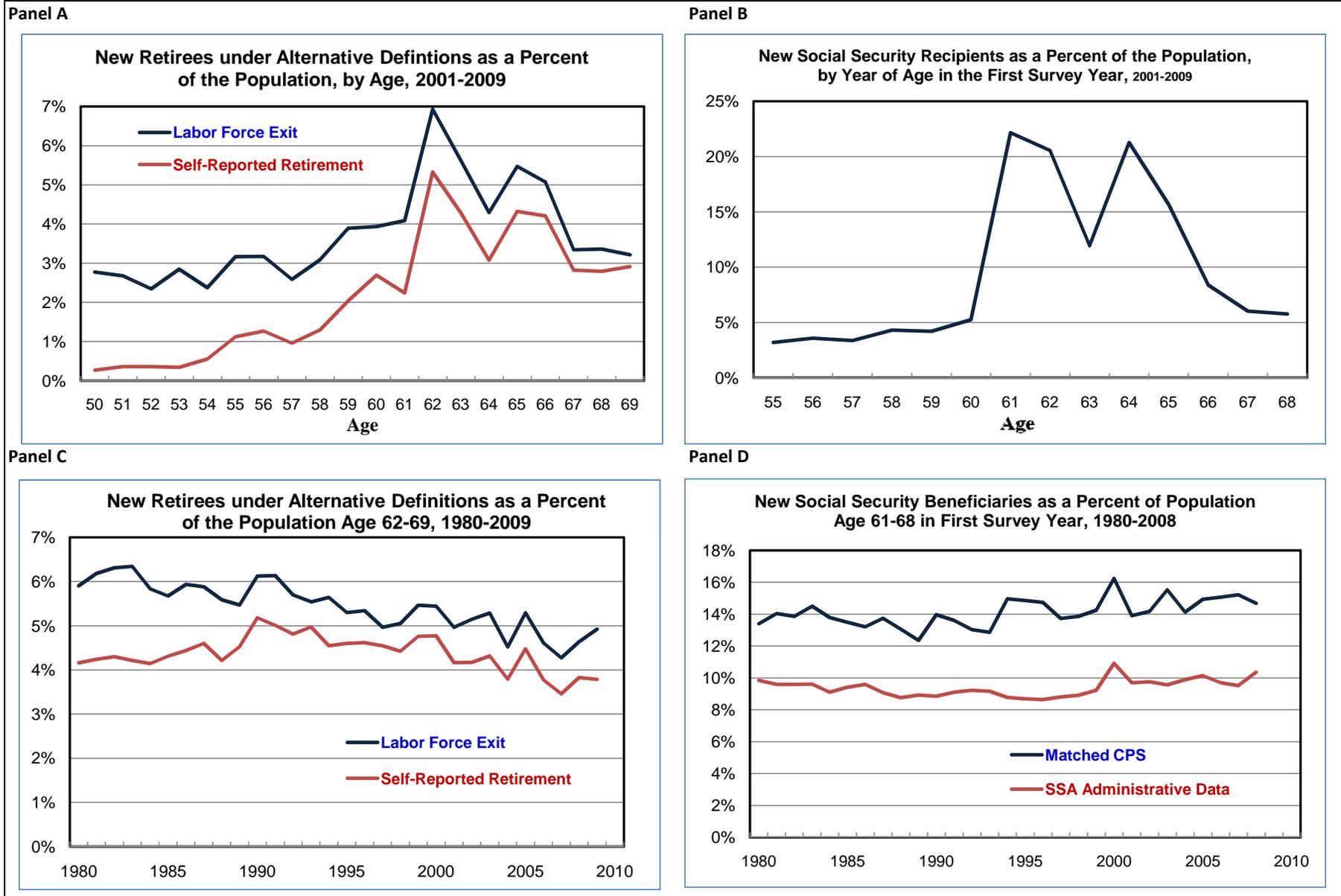


Panel B



Source: Annual Statistical Supplement to the Social Security Bulletin, 2009, table 6.B5 and prior years. The insured population by individual age is constructed from data of the Social Security Administration and the Census Bureau. New awards exclude conversions from disability. The estimates are adjusted to reflect a definitional break in 1984/1985.

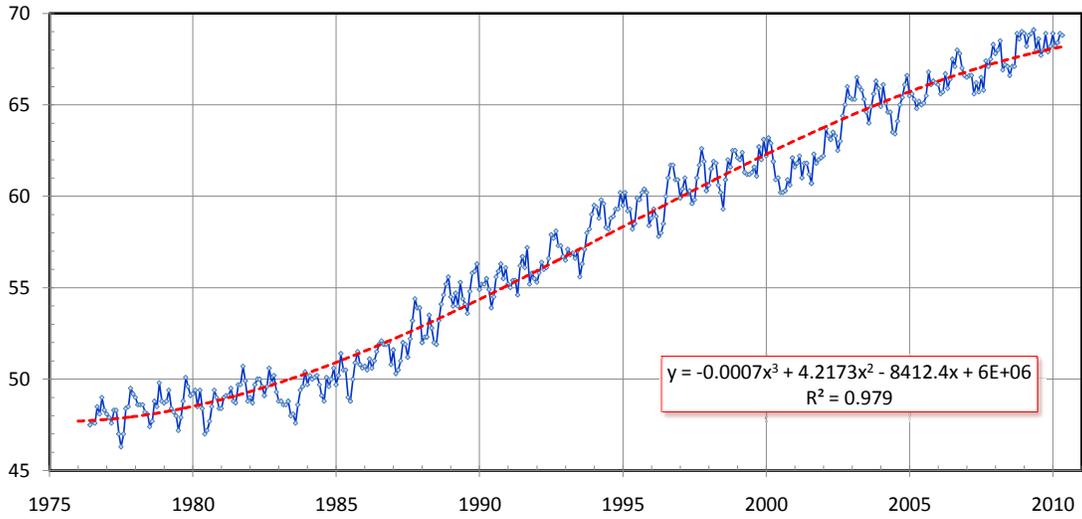
Figure 4. Alternative Measures of Labor Force Exit and Retirement



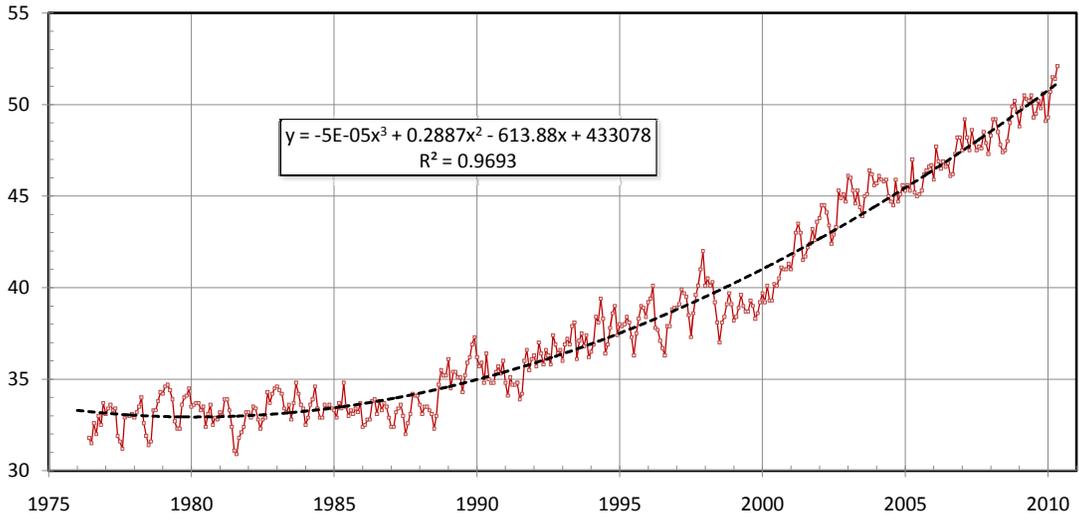
Source: Computed by the authors from the March (ASEC) supplement to the CPS and the matched information from respondents to two consecutive March supplements. The social security administrative data are from Figure 3.

Figure 5. Female Labor Force Participation Rates at Older Ages, 1976-2010

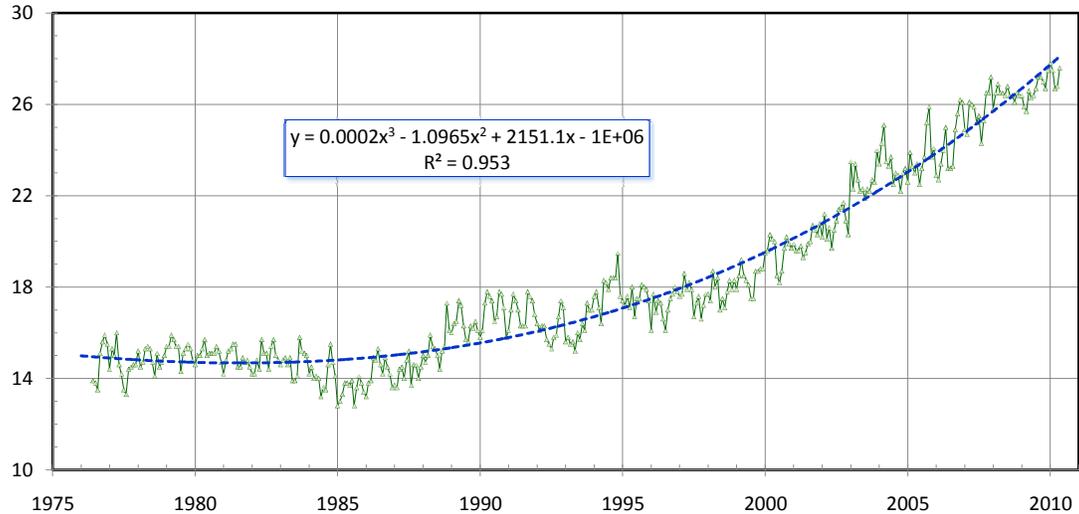
Percent of the female population 55-59



Percent of the female population 60-64



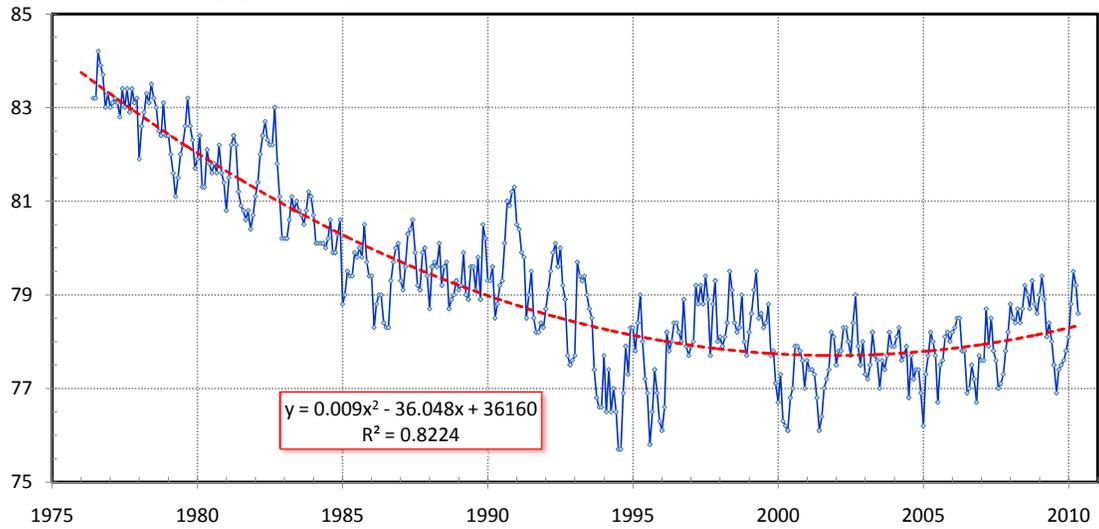
Percent of the female population 65-69



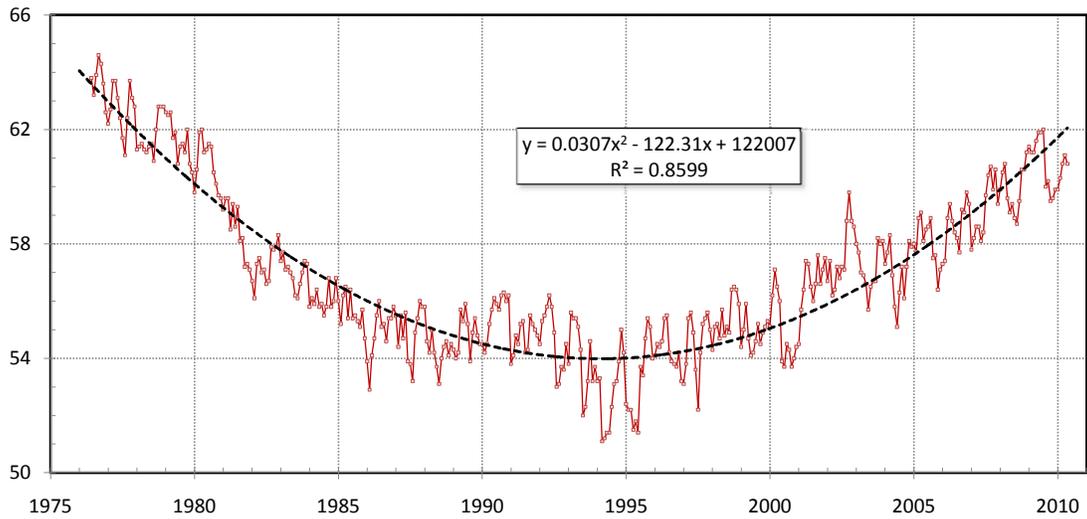
Source: Authors' tabulations of U.S. BLS data.

Figure 6. Male Labor Force Participation Rates at Older Ages, 1976-2010

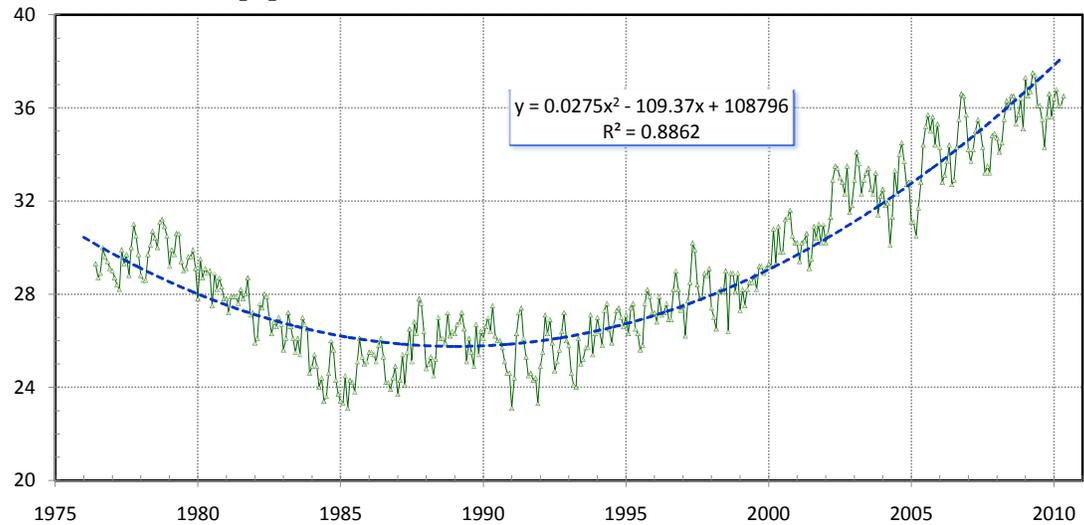
Percent of the male population age 55-59



Percent of the male population 60-64



Percent of the male population 65-69



Source: Authors' tabulations of U.S. BLS data.