Recessions, Social Security, and Living Arrangements of the Elderly

Courtney C. Coile
Department of Economics
Wellesley College
and
NBER
ccoile@wellesley.edu

Phillip B. Levine
Department of Economics
Wellesley College
and
NBER
plevine@wellesley.edu

September 2011

Acknowledgements:
This research was supported by the U.S. Social Security Administration through grant #5RRC08098400-03-00 to the National Bureau of Economic Research as part of the SSA Retirement Research Consortium. The findings and conclusions expressed are solely those of the author(s) and do not represent the views of SSA, any agency of the Federal Government, or the NBER.

Abstract:
We explore the effect of unemployment around the time of retirement on elderly living arrangements. Specifically, we estimate reduced-form models that relate the age-62 unemployment rate to the living arrangements of men ages 70 and above using data from the 2000 U.S. Census and the 2001 through 2009 American Community Surveys (ACS). We find that experiencing a higher unemployment rate at age 62 is associated with a reduced probability of living independently in retirement. The effect is strongest for those who are older, married, and high school graduates. We show that the effect of labor market conditions on elderly living arrangements peaks at around age 62, the age of eligibility for Social Security benefits. These findings, in combination with those from our earlier work, strongly suggest that weak labor markets around the time of retirement have long-lasting, negative effects on retiree well-being and that the mechanism for this effect is earlier retirement and claiming of Social Security benefits.

Keywords: unemployment, recession, Social Security, living arrangements, well-being

I. INTRODUCTION

The recession that began in 2008 is the longest downturn the U.S. has experienced since the Great Depression. Although the recession officially ended in June 2009, the unemployment rate has thus far fallen by only about one point from its peak of 10.1 percent, leaving 14 million Americans out of work more than a year after the recession's end.[1] Among the many groups that may be negatively affected by this and other recessions, older workers may merit particular attention. Older workers who experience a layoff face the potential loss of earnings and pension accumulations during their peak earning years. They may face special hurdles in finding new jobs, including age discrimination (Lahey, 2008) and poor incentives to invest in job training due to the proximity of retirement.

Displaced older workers who are discouraged by poor labor market prospects may feel they have little choice but to retire and claim Social Security benefits when they become available. Coile and Levine (2011a) project that the current economic crisis will lead several hundred thousand older workers to retire earlier than they otherwise would have. Yet retiring and claiming early comes at a cost, as the monthly Social Security benefit amount is reduced for early claiming so as to make expected lifetime benefits essentially independent of claiming age. Older workers who experience a labor market shock thus face the risk of lower income in retirement. Indeed, Coile and Levine (2011b) find that individuals who face a recession around the time of retirement have lower Social Security retirement income later in life.

Income is clearly an important measure of well-being, but it is not the only measure. Economists are increasingly interested in a broader concept of well-being that would include

[1] Recession dating is from the NBER's Business Cycle Dating Committee (http://www.nber.org/cycles.html). The unemployment rate is from the Bureau of Labor Statistics (www.bls.gov, series LNS14000000) and the number of unemployed is from the BLS news release "The Employment Situation – August 2011" (http://www.bls.gov/news.release/pdf/empsit.pdf).

measures such as health status and happiness.[2] The ability to live independently is another outcome that might be included in this broader concept of well-being. Over the last century, there was a dramatic increase in independent living by the elderly (see Figures 1 and 2, described more fully below). Researchers including Costa (1999) and McGarry and Schoeni (2000) have linked this phenomenon to the rise in elderly income over the same time period, and in particular, to the increase in real Social Security income. A decrease in Social Security income caused by a major recession may thus lead to some retrenchment in this trend towards independent living. If privacy is valued by the elderly, as some research indicates (Kehn, 1995), there will be a welfare loss associated with this decrease in independent living.

Although the recent economic crisis motivates our study, our work may be viewed more generally as a contribution to a broader literature on the long-term effects of economic shocks. Specifically, one may draw a parallel between our work and studies exploring the long-term effects of entering the labor market at a time of high unemployment or of experiencing a plant closing. Past studies in these areas (Beaudry and DiNardo, 1991; Oreopolus et. al., 2006) have found that these events have important effects that persist for many years. In theory, shocks experienced around the time of labor market exit could have even greater and longer-lasting effects, since older workers have little time to recoup new human capital investments and may choose to retire and accept the lost income if they feel their labor market prospects are weak. Yet there are relatively few studies of the long-term effects of late-career employment shocks. This paper contributes to the small but growing literature in this area by providing the first (to our knowledge) analysis of the effect of such shocks on elderly living arrangements.

[2] See Di Tella and MacCulloch (2006) for a recent review of the economics literature on happiness.

The purpose of our study is to explore the effect of unemployment around the time of retirement on the living arrangements of the elderly. Following the approach used in our earlier work (Coile and Levine, 2011a and 2011b), we use the unemployment rate in a respondent's state of residence at age 62 as the key explanatory variable in our analysis, making use of variation in labor market conditions across time periods and geographic locations to identify the effect of interest. We estimate reduced-form models that relate the age-62 unemployment rate to living arrangements of those ages 70 and above. The data for our analysis come from the 2000 U.S. Census and the 2001 through 2009 American Community Surveys (ACS). As we discuss in more detail below, we focus on elderly men in our analysis due to a lack of accurate data for widowed women.

We have several key findings. First, we find that labor market conditions around the time of retirement affect living conditions in retirement – specifically, we estimate that experiencing unemployment at age 62 reduces the probability that a man lives independently at ages 70 and above by 6 percentage points, or 7.5% relative to the mean. Second, we find that this effect is strongest for men who are older (those ages 80 and above), married, and high school graduates. Third, we show that the effect of labor market conditions on living arrangements in retirement peaks at around age 62, the age of eligibility for Social Security benefits.

These findings, in combination with those from our earlier work (Coile and Levine, 2011a and 2011b), strongly suggest that weak labor markets around the time of retirement have long-lasting, negative effects on retiree well-being and that the mechanism for this effect is earlier retirement and claiming of Social Security benefits. These results strengthen our conclusion that the problems that older workers face when the labor market weakens are

significant and merit greater public attention, particularly in the context of any discussions of possible future changes to Social Security.

II. BACKGROUND AND LITERATURE REVIEW

The living arrangements of older Americans changed dramatically in the 20th century. Throughout the century and particularly after 1950, older men and women became much more likely to live independently – alone or just with their spouse – and much less likely to live with their children. Figure 1 illustrates this phenomenon for elderly widows. In 1900, 70% of widows age 65 and above were living with their adult children and only 15% were living alone; by 1990, this had essentially reversed, with only 20% of older widows living with their children and over 60% living alone. Figure 2 makes a similar point for older men, although the categories are constructed a bit differently than in the previous figure. In 1900, about 70% of men aged 65 and above were living with their children, either as the household head of a family including children (51%) or as a member of a family in which their child was designated as the head (18%); only 25% were living alone or with their spouse only. By 1990, nearly 75% were living alone or with their spouse only and the share of men in the other two categories combined had shrunk to about 20%.

Social scientists have put forward numerous theories involving changes in demographic, economic, and cultural factors to explain this phenomenon.[3] Economists, perhaps unsurprisingly, have focused on the role played by economic factors, and Social Security in particular. The rise in independent living occurred during the same period of time that Social Security was being introduced, was expanding to cover new groups of workers and to provide

[3] See Kobrin (1976), Kramarow (1995), Macunovich et. al. (1995), Wolf (1995), and Wolf and Soldo (1988) for examples of studies that explore the role of demographic and other factors.

benefits to new categories of beneficiaries (e.g., spouses of retired workers, the disabled), and was experiencing a large increase in real benefit levels. For example, McGarry and Schoeni (2000) report that the share of elderly widows receiving Social Security benefits rose from 16% in 1950 to 95% in 1990 and that the average real benefit among widowed recipients rose nearly three-fold over the same period.

Several studies make clever use of variation in Social Security or other old age benefits to identify the effect of retirement income on living arrangements.[4] Costa (1999) and McGarry and Schoeni (2000) both follow a similar approach, using variation in states' maximum old age assistance benefits prior to the introduction of the federal Supplemental Security Income program in 1974. Both studies estimate that roughly half of the increase in independent living among elderly widows in the latter half of the 20th century can be explained by increases in Social Security benefits. Englehardt et. al. (2005) use the Social Security "notch," the dramatically different Social Security benefit levels experienced by individuals born in the 1910-1921 cohorts as the result of legislative changes in the benefit formula. They estimate an elasticity of living with others with respect to Social Security income of -0.4, with larger effects for widows and divorced women, and project that a 10% cut in Social Security benefits would lead some 600,000 elderly households to move into shared living arrangements.

We too are interested in the effect of economic factors on living arrangements of older Americans, but explore a new question, the effect of labor market conditions around the time of retirement on the living arrangements of the elderly. Our interest in this question originates from our past work on retirement decisions. In Coile and Levine (2007 and 2011a), we pool thirty years of data from the Current Population Survey and make use of variation in labor market

[4] For an interesting historical paper in this literature, see Costa (1997), who makes use of exogenous variation in Union Army pensions to identify the effect of retirement income on elderly living arrangements.

conditions across time and across geographic locations to explore the effect of late-career unemployment on retirement decisions. We find that experiencing weak labor market conditions around the time of retirement is associated with earlier retirement.[5]

This finding naturally leads us to ask whether changes in retirement behavior that are driven by labor market conditions have long-term impacts on retiree income and well-being. To the extent that individuals are able to adjust other behaviors to offset the effect of a labor market shock – for example, to have a spouse work more – the effect of the shock may be minimal. But the ability of older families to adjust in these ways may be limited by the proximity of retirement, and once workers retire, their ability to change their level of income is limited. This raises the possibility that late-career unemployment will result in lower retiree income.

We explore this question in Coile and Levine (2011b), using data and methods similar to those employed here. We find that weak labor market conditions around the age of retirement are associated with lower Social Security income and lower total income for men aged 70 and above, particularly for those with less education. We hypothesize that earlier Social Security claiming is a key mechanism – workers who experience a late-career layoff may feel they have no choice but to claim Social Security benefits when they are first available at age 62, resulting in a permanently lower benefit amount than that which they would have received if they had retired and claimed at a later date. The magnitude of the effect we estimate is consistent with affected workers claiming benefits several years early. The stronger effect for the less educated is as expected, given that they experience higher unemployment rates in general and sharper peaks in unemployment during recessions (Farber, 2011).

[5] The finding that retirement transitions are cyclical sensitive is supported by other studies, including von Wachter (2007), Hallberg (2008), Friedberg et al. (2008) and Munnell et al. (2008).

The finding that labor market conditions around the time of retirement affect retiree income some ten to fifteen years later motivates us to explore their effect on other measures of well-being. As we explain in more detail below, the empirical strategy we employ in this paper is similar to that used in our earlier work, but we focus on a new outcome measure, elderly living arrangements. While our primary focus is on the effect of labor market conditions on living arrangements, the models we estimate also control for stock market conditions. In previous work (Coile and Levine, 2010 and 2011a), we find that weak stock market conditions are associated with delayed retirement for highly educated workers and may lead to some reductions in investment income for those at the top of the income distribution. While it seems relatively unlikely that the living arrangements of families at the upper end of the distribution will be strongly affected by stock market conditions, this is ultimately an empirical question that we can explore in our analysis.

III. DATA AND METHODS

Our analysis will make use of data from the 2000 Census and the 2001 through 2009 American Community Surveys (ACS). We augment these data with external information on market conditions in labor markets and equity markets. We begin this section by detailing the data issues relevant to this exercise and continue with a description of the methodological approach that we used to estimate our econometric models.

A. Data from the Census and the American Community Surveys

Intuition and our past work suggest that any impact of market conditions on retirement will not be that large in the aggregate. For instance, a major recession would result in, say, an additional five percent of older workers losing their jobs. Only some fraction of those workers

will change their retirement and claiming behavior as a result. This means that only a small share of the total population is at risk of experiencing a loss of retirement income and potentially altered living arrangements as a result of weak market conditions. The effects may be significant for those who experience late-career unemployment, but in the aggregate it will be hard to identify this effect. This suggests that large amounts of data will be required to do so.

We use microdata from the 2000 United States Census and the 2001 through 2009 American Community Surveys (ACS) in our analysis. The Census provides a very large number of observations, 5 percent of the U.S. population. To obtain greater time series variation, we augment these data with the ACS data.[6] The ACS is modeled after the Census, with similar variables and coding, and is available beginning in 2000. We use the unified Census/ACS extracts available from the Minnesota Population Center through the IPUMS USA project.[7] The 2000 through 2004 ACS surveys were nationwide demonstrations geared to provide lessons for full implementation of the survey beginning in 2005. Once fully implemented, the ACS contains data for one percent of the population (for household units – group quarters were not fully incorporated until 2006). In the end, we use data from the 2000 Census and the 2001 through 2009 ACS. Over this period, data are available for over 3.4 million individuals aged 70 and above.[8]

[6] In theory, we could include data from earlier census years, such as 1990 and 1980. However, it is somewhat awkward to have a data set that includes continuous data from 2000 to 2009 and only sporadic (once a decade) data from earlier years. The sample we use includes individuals born in the years 1914-1939 (individuals who were ages 70 or above in survey years 2000-2009), which represents a big enough time span to provide significant variation in labor market conditions (and stock market conditions) around the time of retirement.

[7] The citation for this data is Ruggles, et al. (2010), and the URL for these data is http://usa.ipums.org/usa/

[8] Alexander, et al. (2010) cautions users about the potential that the age and sex variables in the 2000 Census and 2003-2006 American Community Surveys may include some miscoded data due to erroneous disclosure avoidance procedures. By August 2011, the Census Bureau had released new versions of all of the affected data sets with correct age information (for details, see http://usa.ipums.org/usa/revisions.shtml#update051911). The data for this project was downloaded after the corrected versions of the data were posted.

We restrict our attention to the living arrangements of men. Our decision to do so is largely related to program rules and data availability. Most women in these birth cohorts are likely to receive Social Security payments on the basis of their husbands' work history, either because their own work history is insufficient to qualify them for benefits or because their dependent spouse or survivor benefits are greater than their own retired worker benefits. This means that it is the market conditions present around the time that he retired that may matter, not those present when she retired. For those women who have become widowed, however, we have no data on the age of her husband, so it is not feasible to implement our strategy for women. Restricting the sample to men reduces the sample size to just under 1.4 million.

The key outcome variable for this project is an indicator variable identifying whether an individual retiree is living independently. Living independently is defined as living alone or with one's spouse only (those who live only with a spouse and children under the age of 18 are also classified as living independently). Those who do not live alone include those living with adult children and those living with others, for example siblings, other relatives, or partners to whom they are not married. One interesting question is how to handle those living in group quarters. The Census and ACS classify such individuals as living alone. Our default is to follow this definition, but we also test the sensitivity of our results to this assumption by dropping them from the analysis.

As we describe in more detail subsequently, one key explanatory variable in our analysis is the unemployment rate in the respondent's state of residence at age 62. Ideally we would know where the respondent lived when he was 62 years old, but in practice, all we know is his state of residence in the survey year. We therefore assume that no mobility has taken place between age 62 and the survey year, assigning the unemployment rate in the year the respondent

was age 62 in the respondent's current state of residence.[9] State-level unemployment data is available from the Bureau of Labor Statistics starting in 1976. Limiting the sample to those who were 62 in 1976 or later reduces the sample to our final sample size of 1,329,032.

We also attach to these data information on the stock market conditions that existed around the time that the respondent was making retirement decisions. We create four additional variables based on the December average values of the Standard & Poors 500 Index, adjusted for inflation. These variables capture the five-year real rate of growth in the index starting in the year the respondent turned age 50, 55, 60, and 65. Our reasoning for choosing these measures is described subsequently.

B. Methods

The main question we seek to address is the long-term impact of market conditions around the time of retirement on retirement income. The first issue that is raised by this question is what we mean by "around the time of retirement." In theory, if we could observe every individual's complete work history, we could think about alternative definitions of retirement (departure from "career job," complete labor force withdrawal, etc.), choose an appropriate one for our purposes, and assign that retirement date to each record in the data. We could then attach the unemployment rate at that time and the stock market return in the preceding five or ten years to each worker's record. In practice, of course, surveys that are of sufficient size to be useful for our analysis do not contain that level of information on respondents' work histories.

[9] The Census data contains current state of residence along with state of residence five years ago. We use this data to estimate the likelihood that individuals between the ages of 65 and 69 moved across state lines in the past five years, since the time when they were between the ages of 60 to 64. Our results indicate that 83 percent of respondents reside in the same state. The main discrepancies occur for those who move to either Arizona or Florida. We found that excluding residents of those states had little impact on our results. Therefore, while we acknowledge the possibility of measurement error in our analysis, we do not think it is likely to be a particularly serious problem.

Even if we had this information, it is not clear whether we would want to use it in this way, as the timing of retirement may be endogenous. Those who are willing to live on less and who receive greater disutility from work may retire earlier. If those preferences have any time series and/or regional variation, they may be correlated with changes in market conditions. We would rather assign market conditions to workers around the time of their retirement using alternative, exogenous measures that still may capture the market constraints workers face when they consider retirement.

To capture labor market conditions, we have chosen to use the state unemployment rate in the year that an individual is 62 years old as our preferred measure. This value has the advantage of being exogenous to individual decision-making and occurs at a time at which previous research has shown that there is a spike in retirement rates, coincident with the initial eligibility of Social Security retirement benefits. Our own past work (Coile and Levine, 2007 and 20011a) has shown that the impact of labor market conditions on retirement decisions does not begin until age 62, further supporting this decision. We also experiment with using the unemployment rate at different ages, as discussed further below. [10]

To capture equity market conditions, we have chosen to use the five-year real rate of return in the S&P 500 starting in the year the respondent turned age 50, 55, 60, and 65 (representing returns between ages 50 and 55, 55 and 60, 60 and 65, and 65 and 70, respectively). Our past work shows that retirement decisions are more likely to respond to longer-term changes in market returns, including those at a five-year interval. Our analysis of living arrangements focuses on respondents beginning at age 70, so working backwards from there seems like a reasonable approach. The value of using multiple five-year intervals is that

[10] We have also estimated models including the unemployment rate at each age in the same regression; however, we obtained unstable results, presumably because of the high serial correlation in year-to-year unemployment rates.

the impact of market returns at different ages may have differential effects on retirement income. These effects would be determined by the age profile of stock ownership and stock holdings conditional on ownership. As stock ownership rates and levels may change as a worker ages, the potential impact of stock market returns on subsequent retirement income may change as well.

The source of variation in these labor market and stock market variables is somewhat different, but both are based on the differing historical experiences of individuals born into different birth cohorts. In essence, we treat the labor market and stock market conditions around the time of retirement as a draw that is randomly assigned to individuals. If we only observed retirees in one year, this approach would be equivalent to an identification strategy that is solely based on an individual's age in the survey year. The fact that we have multiple surveys enables us to also control for aging patterns in retirement income with age fixed effects, since we are able to observe individuals at the same age who were born in different birth cohorts. Similarly, we are able to control for contemporaneous patterns in retirement income with survey year fixed effects, which aggregate different ages in each survey year to see if there are collective patterns in retirement income over time.

The one potential weakness of our identification strategy is that we are not able to control for patterns in retirement income across birth cohorts that may have occurred for reasons other than differing market conditions through the use of birth cohort fixed effects. If there are systematic patterns in retirement income by birth cohort that happen to be related to market conditions, this will introduce bias into our analysis. As a further check, we estimate models separately by education group. Less educated workers experience higher levels of unemployment and sharper peaks in unemployment during recessions (Farber, 2009). If we find a stronger effect of labor market conditions on elderly living arrangements for the less educated,

this would tend to counter any alternative cohort-related explanations for our findings, unless the bias from this alternative explanation also happened to vary with education in the same way.

Appendix Table 1 provides additional detail regarding the variation in labor market conditions that we use in our identification strategy. The table shows the unemployment rate respondents experienced at age 62 by survey year (2000 through 2009) and respondents' age in each survey years (ages 70 to 80 are shown on the table, though we have older individuals in our sample in each year as well). The national unemployment rate at age 62 varies from a high of 9.7 percent to a low of 4.0 percent for the cohorts used in the analysis. Looking across the table, there is variation in the unemployment rate that respondents experienced at age 62 not only across surveys and across ages (reflected in the different values in a single row or column, respectively), but also across the interaction of surveys and ages. In the context of panel data methods, we are able to include both survey year and age fixed effects and maintain our identification based on the interaction of the two. Moreover, although this is not evident from the table, there are further differences across individuals in the unemployment rate they faced at age 62 due to geographic variation. In our analysis, we assign to each individual the state unemployment rate that existed when he was 62 years old. Our identification strategy relies on all of these sources of variation in the data.[11]

This discussion leads us to our formal econometric specification. The models we estimate take the form:

$$\begin{aligned} \text{Independent}_{i,s,t,a} = \beta_0 + \beta_1 \cdot \text{UR62}_{s,t,a} + \beta_2 \cdot \text{SP5055}_{t,a} + \beta_3 \cdot \text{SP5560}_{t,a} + \beta_4 \cdot \text{SP6065}_{t,a} \\ + \beta_5 \cdot \text{SP6570}_{t,a} + \beta_6 \cdot X_{i,s,t,a} + \gamma_s + \gamma_t + \gamma_a + \varepsilon_{i,s,t,a} \end{aligned} \quad (1)$$

[11] The source of variation in our stock market measures is similar, with one key difference: there is no geographic variation. For instance, those respondents who were 79 years old in 2000 would have been 55 years old in 1976. The S&P 500 fell by 29 percent between 1976 and 1981 in real terms. Similarly, a 74-year-old respondent in that survey year was 55 years old in 1981; the market rose 68 percent in real terms in the following five years.

In this specification, the dependent variable is an indicator variable (equal to 1 if the person lives independently) for individual i who resides in state s in survey year t and is age a in the survey year.

As described earlier, the key explanatory variable is the unemployment rate at age 62; we also include the five-year real rates of returns in the S&P 500 index between ages 55 and 70, as described earlier. We also include other individual characteristics (X) as covariates, including race, ethnicity, marital status, and educational attainment. In addition to these variables, we include the contemporaneous unemployment rate as well as fixed effects that generically control for differences across survey years, across ages, and across states of residence.

Before turning to our empirical results, we present summary statistics for our sample in Table 1. About 80% of men in our sample are living independently; three-quarters of these (60.0% of the overall sample) live with their spouse (or spouse and non-adult children) only, while the remaining one-quarter (20.5% of the overall sample) lives alone. Of the nearly 20% of the sample not living independently, roughly two-thirds (12.3% of the overall sample) live with adult children, while the remaining one-third (7.2% of the overall sample) live with others, which may include siblings, other relatives, unmarried partners, or other individuals. Some 2.9% of the sample lives in group quarters; as noted above, these are counted as living alone by the Census definition. Just over 70% of the sample is married, 11% are non-white, and 5% are Hispanic; the sample is roughly evenly divided into those with at least some college (36%), high school graduates (38%), and high school dropouts (27%). The average age-62 unemployment rate for men in the sample is 6.2%, although there is substantial variation in this measure, as shown in Appendix Table 1.

IV. RESULTS

The first set of empirical results is displayed in Table 2. We find that a higher age-62 unemployment rate is associated with a reduced probability of living independently; this effect is statistically significant at the 5% level. Excluding those living in group quarters from the analysis (column 2) has a negligible effect on the estimate.

The interpretation of the magnitude of this coefficient is not straightforward. The coefficient on the table is multiplied by 100, representing the effect of a 100-point increase in the unemployment rate. If one thinks of this as a 100% increase in the probability of being unemployed for the year, then we could say that becoming unemployed lowers the probability of living independently by 5.95 percentage points, or 7.4% relative to the mean rate of 80.5%. In reality, spells of unemployment vary in duration. A 1-point increase in unemployment may mean that an additional 2% of the workforce is unemployed for 6 months each rather than that an additional 1% of the workforce is unemployed for one year, for example. Assuming that all spells of unemployment last six months instead of a year would imply that the effect for each affected person is only half as large as that described above. For convenience, we will describe the magnitude of the effect in terms of the effect on the marginal unemployed worker (implicitly assuming he is unemployed for a full year), but we acknowledge the limitations of this interpretation.

The contemporaneous unemployment rate also has a negative effect on the probability of living independently. In column 1, this coefficient is twice as large as that on the current unemployment rate and significant at the 10% level; eliminating those in group quarters, however, renders the coefficient insignificant. In theory, the contemporaneous unemployment rate certainly could affect elderly living arrangements, though the story is presumably a bit

different. In the first case, one assumes (in part informed by results from our earlier work) that a higher age-62 unemployment rate leads some additional individuals to retire and claim Social Security benefits earlier than they otherwise would have, resulting in lower retirement income and greater difficulty in maintaining an independent household in retirement. In the case of the contemporaneous unemployment rate, since very few men in our samples (age 70 through 90+) are working, it is more likely that a higher unemployment rate makes it more difficult for adult children to maintain their own independent household, and that this is driving the increase in joint living arrangements. However, as noted above, the effect of the contemporaneous unemployment rate appears to be less robust.

Table 1 also displays the coefficients on the 5-year real stock market returns at ages 50-55, 55-60, 60-65, and 65-70. These coefficients are all negative, though only those at ages 60-65 and 65-70 are significant. The coefficients are, once again, multiplied to show the effect of a 100-point change in the return, or roughly 2-3 times the average real 5-year return experienced during this period (as seen in Table 1). Taking the age 60-65 return (the largest and most significant coefficient), a 100-point increase in the return reduces the probability of living independently by 0.31%, or 0.4% relative to the mean of 80.5%. This suggests that even a fairly large change in stock market returns will have a relatively small effect on living arrangements on average.[12]

The coefficients on the demographic variables in Table 1 all go in the expected direction and are statistically significant and large in magnitude. Married men are 14 percentage points

[12] There could potentially be a larger effect for those who have greater stock assets, as the coefficient shows an average effect that aggregates over all types, including the (much larger) share of the population that does not have significant stock assets. When we estimate our models by education group in Table 3, the coefficients on the 5-year stock market return (not shown) for those with at least some college are 2-3 times larger than those shown here. If it were possible to refine this approach further and isolate those who had substantial stock assets in their 50s and 60s, the effects might be even larger; unfortunately, this is not possible with the data available in the Census.

more likely to live independently, while nonwhites and Hispanics are each about 17 percentage points less likely (reflecting, perhaps, the effect of having lower socioeconomic status on average). Relative to high school dropouts, high school grads are 3 percentage points more likely to live independently and those with some college are over 6 percentage points more likely to do so.

In Table 3, we estimate the models separately by level of education, age group, and marital status; these models include the same covariates and fixed effects as those displayed in Table 2. Turning first to the education results, we find the largest effects for those with a high school education. While in some ways we might expect the effect to be monotonic with respect to education – that is, for the effect of market conditions on living arrangements to be largest for high school dropouts, next largest for high school graduates, and smallest for those with some college or who are college graduates – this finding of a stronger effect for high school graduates is actually consistent with findings in our earlier work (Coile and Levine, 2011a) on the effect of labor market conditions on retirement.[13] In sum, the pattern of coefficients (u-shaped with a peak for high-school graduates) is consistent with earlier work, though none of the differences across education group are statistically significant.

The next two columns show the effect of estimating our models separately for those age 70-79 and 80 and above. We find that the response of elderly living arrangements to age-62 labor market conditions is concentrated among those 80 and above. One potential explanation for this finding is that as households age, they may experience a number of changes, such as the

[13] In that paper we explain this finding as follows: "One interesting finding is that the retirement rates of high school dropouts do not appear to be affected by labor market conditions despite the fact that their employment is highly cyclically sensitive. The greater cyclical sensitivity in their employment, however, does not necessarily need to translate into a higher likelihood of retirement. It could be the case that the workers whose retirements are most affected are, for instance, manufacturing workers (high school graduates) who lose relatively well paying jobs during a recession, are unable to find jobs of similar quality, and retire as a result. By contrast, those at the very bottom of the distribution may have no alternative other than to keep looking for work because they have so few resources. This point is worthy of further study."

death of a spouse or worsening health, that make it more important to have financial resources in order to continue living independently (for example, to be able to afford to have an aide come for a few hours each day); as a result, the sensitivity of living arrangements to age-62 labor market conditions could strengthen with age. This difference is highly statistically significant.

In the last set of columns on Table 3, we compare the results by marital status. We find that age-62 labor market conditions have a greater effect on living arrangements for married people than for singles. This is a bit surprising, given that Englehardt et. al. (2005) find a greater elasticity of living arrangements with respect to Social Security income for single individuals, although a very obvious difference between their results and ours is that they report results for widows while our sample is limited to single men. This subject merits further study.

In Table 4, we re-estimate our model using the unemployment rate at different ages; each cell on the table represents the results from a separate regression with one single-age unemployment rate. The results display a very clear U-shaped pattern: there are negative coefficients (the expected sign) at ages 60-66, they are significant (at the 10% level or better) at ages 61-63, and the magnitude of the coefficient also peaks at ages 61-63. This is consistent with a story where unemployment has the greatest effect on retirement decisions, Social Security claiming, and retiree income when it occurs around age 62; we show exactly this (with respect to the effect on retirement) in earlier work (Coile and Levine, 2007). Essentially, if someone is laid off several years before age 62, their access to Social Security benefits is sufficiently far away that they have no choice but to continue in the labor force, sometimes eventually landing a job (however inferior to the one lost). If a worker is relatively close to age 62 when he loses his job, he may choose to claim benefits at age 62 if he feels pessimistic about his labor market prospects, leading to lower income in retirement, as previously discussed. Unemployment at

later ages has progressively less effect because more workers have already retired, and thus their decisions and well-being are unaffected by the unemployment rate.

V. CONCLUSIONS

The depth and persistence of the current economic crisis has led many researchers, journalists, and policy makers to ask what behavioral responses we can expect in response to the current crisis (or, more generally, in response to fluctuations in the business cycle) and what the implications of the crisis are for well-being. In previous work, we have found that downturns in the labor market lead some workers to retire earlier and to receive lower Social Security income in retirement, presumably as a result of earlier Social Security claiming. In this work, we expand our analysis of the long-term effects of recession on retiree well-being to explore the effect on elderly living arrangements. We find that weak labor market conditions around the time of retirement are associated with a reduced probability of living independently in retirement for men. These effects are more pronounced among men who are older, married, and have only a high school education. The fact that the effect of late-career labor market conditions on subsequent living arrangements peaks around age 62 is consistent with our earlier work and strongly suggests that the mechanism for this effect is earlier retirement and claiming by workers who lose their jobs close to the time they become eligible for Social Security benefits. In sum, our work suggests that sharp downturns in the labor market, such as the weakness that is currently plaguing the U.S. labor market, have long-lasting consequences for retiree well-being, at least along the dimension of living arrangements.

References

Alexander, J. Trent, Michael Davern, and Betsey Stevenson (2010). "Inaccurate Age and Sex Data in the Census PUMS files: Evidence and Implications." NBER working paper 15703.

Beaudry, Paul and John DiNardo (1991). "The Effect of Implicit Contracts on the Movement of Wages Over the Business Cycle: Evidence from Micro Data." *Journal of Political Economy*. 99(4): 665-688.

Costa, Dora L. (1997). "Displacing the Family: Union Army Pensions and Elderly Living Arrangement," *Journal of Political Economy* 106(6): 1269-92.

Costa, Dora L. (1999). "A House of Her Own: Old Age Assistance and Living Arrangements of Older Nonmarried Women," *Journal of Public Economics* 72(1): 39-60.

Coile, Courtney C. and Phillip B. Levine (2007). "Labor Market Shocks and Retirement: Do Government Programs Matter?" *Journal of Public Economics* 91(10):1902-1919.

Coile, Courtney C. and Phillip B. Levine (2010). *Reconsidering Retirement: How Losses and Layoffs Affect Older Workers.* Washington, D.C.: Brookings Institution Press.

Coile, Courtney C. and Phillip B. Levine (2011a). "The Market Crash and Mass Layoffs: How the Current Economic Crisis May Affect Retirement," *The B.E. Journal of Economic Analysis and Policy* Vol. 11: Iss. 1 (Contributions): Article 22.

Coile, Courtney C. and Phillip B. Levine (2011b). "Recessions, Retirement, and Social Security," *American Economic Review* 101(3): 23-28, May.

Di Tella, Rafael, and Robert MacCulloch (2006). "Some Uses of Happiness Data in Economics," *Journal of Economic Perspectives* 20(1): 25-46, Winter.

Englehardt, Gary V., Jonathan Gruber, and Cynthia D. Perry (2005). "Social Security and Elderly Living Arrangements: Evidence from the Social Security Notch," *Journal of Human Resources* 40(2): 354-372, Spring.

Farber, Henry S. (2011). "Job Loss in the Great Recession: Historical Perspective from the Displaced Workers Survey, 1984-2010," Working Paper #574, Princeton University Industrial Relations Section.

Friedberg, Leora, Michael Owyang, and Anthony Webb (2008). "Identifying Local Differences in Retirement Patterns." Center for Retirement Research Working Paper #2008-18.

Hallberg, Daniel (2008). "Economic Fluctuations and Retirement of Older Employees." Institute for Labour Market Policy Evaluation #2008-2.

Kehn, Diane J. (1995). "Predictors of Elderly Happiness." *Activities, Adaptation & Aging*, 18(3): 11–30.

Kobrin, Frances E. (1976). "The Fall in Household Size and the Rise of the Primary Individual in the United States," *Demography* 13(1): 127-138.

Kramarow, Ellen A. (1995). "The Elderly Who Live Alone in the United States: Historical Perspectives on Household Change," *Demography* 13(1): 127-138.

Lahey, Joanna (2008). "Age, Women, and Hiring: An Experimental Study," *Journal of Human Resources*, 43(1): 30-56, Winter.

Macunovich, Diane J., Richard A. Easterlin, Christine M. Schaeffer, and Eileen M. Crimmins (1995). "Echoes of the Baby Boom and Bust: Recent and Prospective Changes in Living Alone among Elderly Widows in the United States," *Demography* 32(1): 17-28.

McGarry, Kathleen and Robert F. Schoeni (2000). "Social Security, Economic Growth, and the Rise in Elderly Widows' Independence in the Twentieth Century," *Demography* 37(2): 221-236.

Munnell, Alicia H., Mauricio Soto, Robert K. Triest, and Natalia A. Zhivan (2008). "How Much Do State Economics and Other Characteristics Affect Labor Force Participation of Older Workers?" Center for Retirement Research Working Paper #2008-12.

Oreopoulos, Phil, Till von Wachter, and Andrew Heisz (2006). "The Short- and Long-Term Career Effects of Graduating in a Recession: Hysteresis and Heterogeneity in the Market for College Graduates." National Bureau of Economic Research, working paper 12159.

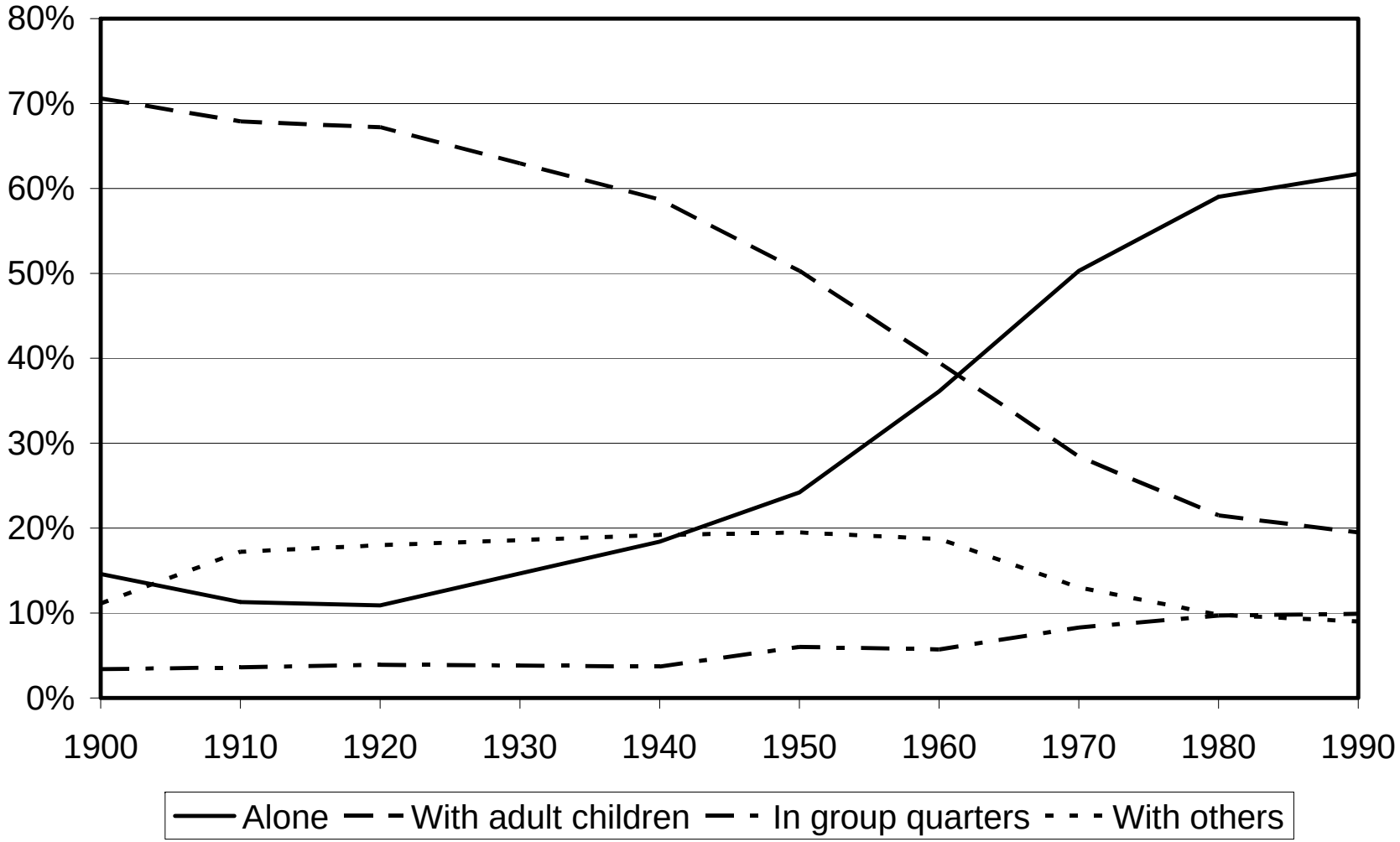
Ruggles, Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. Integrated Public Use Microdata Series: Version 5.0 [Machine-readable database.] Minneapolis: University of Minnesota, 2010.

von Wachter, Till (2007). "The Effect of Economic Conditions on the Employment of Workers Nearing Retirement Age." Center for Retirement Research Working Paper #2007-25.

Wolf, Douglas A. (1995). "Changes in the Living Arrangements of Older Women: An International Study," *The Gerontologist* 35(6): 724-731.

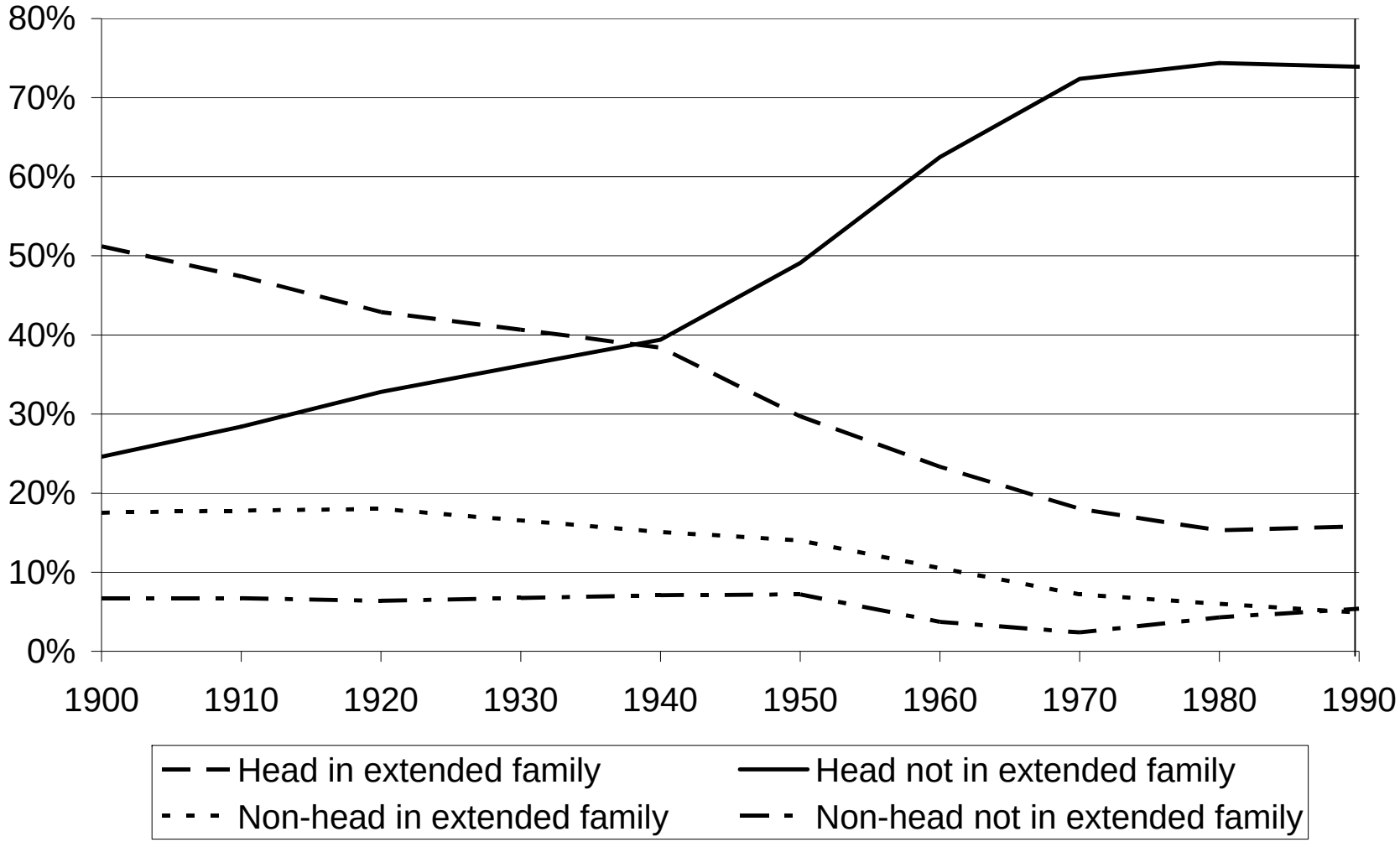
Wolf, Douglas A. and Beth J. Soldo (1988). "Household Composition Choices of Older Unmarried Women," *Demography* 25(3): 387-403.

Figure 1: Living Arrangement of Widows Age 65+, 1900-1990



Source: Data from McGarry and Schoeni, 2000.

Figure 2: Living Arrangements of Men 65+, 1900-1990



Source: Data from Costa, 1997.

Table 1: Sample Means

Variable	Full Sample	Married	Unmarried
Living Indepedently	80.5%	85.3%	69.3%
Living alone	20.5%	--	69.2%
Living with spouse only	60.0%	85.3%	--
Not Living Independently	19.5%	14.8%	30.7%
Living with kids	12.3%	11.6%	14.0%
Living with others	7.2%	3.2%	16.7%
Living in Group Quarters	2.9%	0.0%	9.6%
Unemployment Rate			
At age 62	6.4%	6.4%	6.6%
Current	5.1%	5.1%	5.1%
Stock Return (5-year real)			
Age 50-54	6.6%	8.4%	2.4%
Age 55-59	30.2%	32.6%	24.5%
Age 60-64	47.6%	49.2%	44.0%
Age 65-70	53.1%	53.4%	52.6%
Married	70.3%	100.0%	0.0%
Nonwhite	11.0%	9.1%	15.6%
Hispanic	4.6%	4.2%	5.5%
Education			
Less than HS	26.9%	24.1%	33.5%
HS graduate	37.5%	37.8%	36.6%
Any college	35.7%	38.1%	29.9%
Age	76.9	76.4	77.9
Number of Observations	1,329,032	934,560	394,472

Notes: Sample is men age 70+ in the 2000 U.S. Census and the 2001-2009 American Community Survey.

Table 2: Effect of Age-62 Unemployment on Elderly Living Arrangements

Variable	Dependent Variable: Living Independently	
	Full Sample	Excluding Those in Group Quarters
Unem Rate: Age 62 (x100)	-0.0595	-0.0554
	(0.0260)	(0.0272)
Unem Rate: Current (x100)	-0.1330	-0.0993
	(0.0788)	(0.0789)
Stock Return: Age 50-55	-0.0002	-0.0020
	(0.0023)	(0.0025)
Stock Return: Age 55-60	-0.0031	-0.0022
	(0.0023)	(0.0024)
Stock Return: Age 60-65	-0.0031	-0.0030
	(0.0014)	(0.0014)
Stock Return: Age 65-70	-0.0016	-0.0012
	(0.0008)	(0.0008)
Married	0.1435	0.1733
	(0.0056)	(0.0051)
Non-white	-0.1700	-0.1774
	(0.0100)	(0.0099)
Hispanic	-0.1709	-0.1739
	(0.0100)	(0.0099)
Educ: High School Grad	0.0306	0.0338
	(0.0031)	(0.0031)
Educ: Some College	0.0631	0.0677
	(0.0040)	(0.0042)
Observations	1,329,032	1,291,093

Notes: Unemployment rate and stock return coefficients show the effect of a 100-point change. Regressions also include age, year, and state fixed effects. Standard errors are clustered by state.

Table 3: Effect of Unemployment by Education, Age, and Marital Status

Variable	Education			Age		Marital Status	
	Less than High School	High School Graduate	Any College	70-79	80+	Married	Unmarried
Unem Rate: Age 62 (x100)	-0.0478	-0.1011	-0.0605	0.0116	-0.1402	-0.0733	-0.0237
	(0.0676)	(0.0341)	(0.0396)	(0.0258)	(0.0542)	(0.0212)	(0.0612)
Number of Observations	357,022	498,051	473,959	934,598	394,434	934,560	394,472

Notes: Each coefficient is from a separate regression. Regressions also include: current unemployment rate; stock market returns at ages 50-55, 55-60, 60-65, and 65-70; dummies for marital status, race/ethnicity, and education; and age, year, and state fixed effects. Standard errors are clustered by state.

Table 4: Effect of Unemployment at Different Ages

Variable	Coefficient
Unem Rate: Age 55 (x100)	-0.0443
	(0.0309)
Unem Rate: Age 56 (x100)	0.001
	(0.0260)
Unem Rate: Age 57 (x100)	0.0286
	(0.0242)
Unem Rate: Age 58 (x100)	0.0212
	(0.0299)
Unem Rate: Age 59 (x100)	0.0066
	(0.0315)
Unem Rate: Age 60 (x100)	-0.0254
	(0.0237)
Unem Rate: Age 61 (x100)	-0.0430
	(0.0266)
Unem Rate: Age 62 (x100)	-0.0595
	(0.0260)
Unem Rate: Age 63 (x100)	-0.0597
	(0.0272)
Unem Rate: Age 64 (x100)	-0.0343
	(0.0252)
Unem Rate: Age 65 (x100)	-0.0220
	(0.0246)
Unem Rate: Age 66 (x100)	-0.0187
	(0.0371)
Unem Rate: Age 67 (x100)	0.0101
	(0.0391)
Unem Rate: Age 68 (x100)	0.0170
	(0.0318)
Unem Rate: Age 69 (x100)	0.0133
	(0.0323)

Notes: Each coefficient is from a separate regression. Regressions include: the current unemployment rate; stock market returns at ages 50-55, 55-60, 60-65, and 65-70; dummies for marital status, race/ethnicity, and education; and age, year, and state fixed effects. Standard errors are clustered by state.

Appendix Table 1: National Unemployment Rate at Age 62,
by Year of Survey and Age in Survey Year

Age in Survey Year	Survey Year									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
70	7.5	6.9	6.1	5.6	5.4	4.9	4.5	4.2	4.0	4.7
71	6.8	7.5	6.9	6.1	5.6	5.4	4.9	4.5	4.2	4.0
72	5.6	6.8	7.5	6.9	6.1	5.6	5.4	4.9	4.5	4.2
73	5.3	5.6	6.8	7.5	6.9	6.1	5.6	5.4	4.9	4.5
74	5.5	5.3	5.6	6.8	7.5	6.9	6.1	5.6	5.4	4.9
75	6.2	5.5	5.3	5.6	6.8	7.5	6.9	6.1	5.6	5.4
76	7.0	6.2	5.5	5.3	5.6	6.8	7.5	6.9	6.1	5.6
77	7.2	7.0	6.2	5.5	5.3	5.6	6.8	7.5	6.9	6.1
78	7.5	7.2	7.0	6.2	5.5	5.3	5.6	6.8	7.5	6.9
79	9.6	7.5	7.2	7.0	6.2	5.5	5.3	5.6	6.8	7.5
80	9.7	9.6	7.5	7.2	7.0	6.2	5.5	5.3	5.6	6.8