Labor Market Shocks and Retirement:

Do Government Programs Matter?

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ABSTRACT

This paper argues that labor market conditions are an important and often overlooked determinant of retirement transitions. In our analysis, we examine how the unemployment rate affects retirement and whether the Social Security (SS) system and Unemployment Insurance (UI) system influence how older workers respond to labor market shocks. We use pooled cross-sectional data from the March Current Population Survey (CPS) in our analysis. We find that downturns in the labor market increase retirement transitions and that the magnitude of this effect is comparable to that associated with moderate changes in financial incentives to retire and to the threat of a health shock facing older workers. Interestingly, retirements only increase in response to an economic downturn once workers become SS-eligible, suggesting that retirement benefits may help to alleviate the income loss associated with a weak labor market. We also estimate the impact of UI generosity on retirement and find little consistent evidence of an effect. This suggests that in some ways SS may serve as a more effective form of unemployment insurance for older workers than UI.

I. INTRODUCTION

While a worker's choice of retirement date has a substantial impact on his or her finances and overall well-being, there is little cause for policy makers to concern themselves with the timing of retirement if these decisions represent utility-maximizing choices by rational agents. In reality, however, there may be several reasons for policy makers to focus on retirement decisions. First, workers may face shocks late in their career, such as the onset of a health problem, that prevent them from retiring at their chosen date. Second, government programs such as Social Security may inadvertently distort workers' retirement decisions. Third, workers may be hampered in selecting the best possible retirement date by myopia or lack of information. Each of these scenarios will have important and different implications for the design of optimal government programs for the retirement-age population.

Within this framework, much of the existing literature on retirement has focused on the effect of poor health or lack of access to health insurance and the effect of Social Security and private pensions on retirement. Yet just as an older worker may experience a health shock that limits his ability to work as long as planned, so too may he become unemployed and find himself constrained by poor labor market conditions from working until his preferred retirement date.[1] If labor market shocks are an important phenomenon for older workers, then it may be desirable to design government policies to protect them from experiencing their full negative effects.

Several studies have established that job loss is relatively common for older workers and has long-lasting consequences on employment and wages, as reviewed subsequently. Certainly,

[1] The constraint that workers face during an economic downturn may be twofold. One obvious problem is the greater likelihood of job loss. Alternatively, workers may experience wage cuts even if they do not lose their jobs. Either mechanism may lead workers to retire. Although the wage effect is a theoretical possibility, in practice it seems unlikely based on past research regarding the cyclicality of real wages. Given the nature of the estimated responsiveness of wages to the business cycle (Devereaux, 2001), the retirement elasticity with respect to the wage would have to be enormous to generate a significant retirement response. In the remainder of the analysis, we focus on the employment effects associated with a weak labor market.

job loss is more common during a recession. From this, one could infer that retirement may be cyclically sensitive, but no previous study has tested this proposition directly.

In this paper, we go beyond the previous literature in two ways. First, we directly estimate the cyclical sensitivity of retirement transitions. Besides formally documenting this relationship, this approach allows us to compare the magnitude of the estimated effect of a labor market downturn on retirement to that of factors more commonly studied. Such a comparison can help policy makers determine whether labor market factors should be taken into consideration in the design of retirement policies. We implement this approach by estimating the relationship between the state-level unemployment rate and retirement, using pooled cross-sectional data from twenty-five years of the March Current Population Survey (CPS).

Second, we investigate whether government programs matter in how workers' retirement behavior responds to labor market shocks. Past research has not examined this issue. We begin by exploring the role of Social Security (SS). Though SS is traditionally viewed as a source of support for retired and disabled workers, it may serve as an additional source of income support for older workers who lose their jobs. To explore this, we examine how the effect of unemployment on retirement varies by age, as any sharp break at age 62 is likely attributable to workers becoming eligible for SS. Finally, we consider whether more generous Unemployment Insurance (UI) benefits reduce the likelihood of retirement transitions, making use of state-level variation in UI benefit levels and eligibility rules. More generous UI benefits are expected to reduce the probability of retirement transitions, as UI may allow workers to delay retirement for the period that benefits are available or for even longer if they find new jobs while on UI.

We have two principal findings. First, we find that the unemployment rate has a positive and significant effect on retirement transitions: an increase in the unemployment rate of 3

percentage points, which corresponds roughly from moving from the peak of an expansion to the trough of a recession, raises the retirement hazard for workers aged 55-69 by roughly 5 percent. The magnitude of this effect is large and comparable to the impact of factors that have received much more attention in the previous literature. Specifically, the increase in retirement associated with a recession is similar to that associated with a $10,000 increase in SS wealth or the threat of a health shock, such as heart attack, stroke, or new cancer diagnosis.

Second, we find that this effect is evident only when workers hit age 62, suggesting that access to SS benefits may allow older workers to weather the financial shock associated with job loss by retiring. However, we find little consistent evidence indicating that more generous UI benefits alter retirement transitions, suggesting that the UI system plays only a minor role at best in assisting older workers who lose their jobs to delay retirement. Taken together, these findings suggest that the SS system may play a bigger role in helping older workers cope with job loss than the UI system.

II. BACKGROUND AND LITERATURE REVIEW

A. Institutional Features of UI and SS

A brief discussion of the pertinent institutional features of SS and UI is useful for our analysis. SS benefits are available to covered workers (those with at least ten years of work experience) starting at age 62. SS benefits are calculated by applying a progressive benefit formula to the worker's average indexed earnings over his best 35 years. The basic monthly benefit amount is then adjusted depending on the age of benefit claim; the adjustment factor is set to be roughly actuarially fair, so that the present discounted value of the stream of benefits received over the worker's lifetime for an average worker will be approximately the same

regardless of the age at which he or she claims. A typical newly retired worker receives a benefit of about $1,000 per month, which equates to a 42 percent replacement rate relative to career average earnings (U.S. Social Security Administration, 2005a and 2005b). Since 1980, covered workers have not been allowed to claim UI and SS benefits simultaneously, although they may claim these benefits sequentially (Hutchens and Jacobson, 2002).

The UI system is administered at the state level with federal oversight. As such, there is a good deal of variation in specific provisions across states, although the basic framework of the program is the same. That framework includes two types of eligibility requirements. Workers satisfy "non-monetary eligibility" if they lose a job through no fault of their own and demonstrate that they are actively looking for work. Workers meet "monetary eligibility" requirements if they had a sufficient work history prior to job loss. In terms of benefits, individuals typically receive an amount equal to half of their pre-unemployment weekly wage, subject to a minimum and maximum benefit. Since the minimum benefit is typically very low, the major source of state variability in the generosity of UI benefits is the maximum weekly benefit. Some states are considerably more generous than others, both in benefit levels and ease of meeting monetary eligibility requirements.[2] On average, UI benefits replace approximately 35 percent of lost earnings (U.S. Department of Labor, 2006). Weekly benefits are available for a limited duration, typically 26 weeks. During a recession, however, this maximum benefit duration is often extended to a longer time period.

[2] In 2004, maximum weekly benefits ranged from $210 in Alabama and Mississippi to $508 in Massachusetts. Minimum earnings requirements to be eligible for UI ranged from $130 in the past year in Hawaii to $3,520 in Ohio in that year. See Levine (2006) for a complete list of maximum weekly benefit amounts and annual earnings requirements by state for 2004. For all years, data on benefit levels and eligibility rules are obtained from: *Highlights of State Unemployment Compensation Laws* (National Foundation for Unemployment Compensation and Workers Compensation, various issues), *Comparison of State Unemployment Insurance Laws* (U.S. Department of Labor, various issues), and *Significant Provisions of State Unemployment Insurance Laws* (U.S. Department of Labor, various issues).

B. Previous Literature

Although little past research has examined the role that unemployment plays in retirement decisions in the U.S., related research on the impact of job loss among older workers and on the role of unemployment and UI in retirement transitions in other countries does inform our discussion. Previous literature has established that job loss among older workers is reasonably common and has long-lasting negative effects on the employment prospects and earnings of these workers. Farber (2005) finds that more than 10 percent of workers aged 55-64 experienced job loss during a recent three-year period. Chan and Stevens (1999 and 2001) estimate that the employment rate of displaced older workers two years after a job loss is 25 percentage points lower than that of similar non-displaced workers and that the median reemployed worker earns 20 percent less than at his previous job. Chan and Stevens (2004) show that displaced workers' lower employment rates cannot be explained by lower wages or lost opportunities to accrue pension benefits at the previous job, leading them to conclude that "other barriers to reemployment may be more important explanations for the low employment rates of recently displaced older workers."

Our work addresses a related but distinct question: we look at whether retirement is cyclically sensitive rather than the effect of job loss on individual workers. Moreover, we also explore whether government programs affect how workers respond to labor market shocks. Neither of these questions has received much attention in the previous literature.[3]

[3] There are two studies that examine these questions, but both employ methodologies very different from ours. Rebick (1994) uses time-series evidence for the U.S., Sweden, and Japan to look at the effect of unemployment on the labor force participation rate and rate of Social Security benefit receipt for older workers. This study is subject to the usual critique that it may be difficult to separate causal effects from spurious correlations between trending variables, particularly given the significant changes in U.S. labor force participation since 1950. Hamermesh (1980) makes an early contribution to the literature by examining the effect of UI receipt and UI income on retirement for a sample of workers from the Retirement History Survey. This differs considerably from our empirical strategy, described in more detail below, of using state-level UI policies to identify the effects of UI on retirement.

Despite the lack of research on this in the U.S., analysts from other developed nations have explored these issues. Hallberg (2006) finds that the probability that a worker takes early retirement in Sweden is affected by deviations in aggregate employment in his industry from the long-run trend. Other researchers have shown that many workers' pathway to retirement includes a period of time spent on UI prior to claiming Social Security benefits. This is the case for 7 percent of older workers in Sweden (Palme and Svensson, 2004), 15 percent in Belgium (Dellis et. al., 2004), over 20 percent in France and Germany (Mathieu and Blanchet, 2004; Borsch-Supan et. al., 2004), and nearly 40 percent in Japan (Oshio and Oishi, 2004).

III. DATA AND EMPIRICAL STRATEGY

A. March Current Population Survey (CPS)

In our analysis, we use data from the March Current Population Survey (CPS) in two different ways. In part of our analysis, we use these data directly ("March CPS") and in part of our analysis we use the longitudinal nature of these data to match responses between one year and the next ("matched March CPS"). We rely more heavily on the March CPS, but we also use the matched March data because they offer the opportunity to validate and extend our initial analysis. We describe these two datasets in this and the following sections.[4]

The March CPS is the leading survey of labor market activity in the United States. The monthly survey asks a sequence of questions about the respondent's involvement in the labor market around the time of survey and also collects demographic data. Importantly, state of residence is available, which we use to merge in state-level data on unemployment rates and UI benefits. In March of each year, the "Annual Demographic File" is administered as a

[4] In an earlier version of the paper (Coile and Levine, 2006), we conducted the same analysis using the Health and Retirement Study (HRS). Results were qualitatively similar, though somewhat less precisely estimated due to the smaller sample size of the HRS.

supplement to the CPS. Respondents are asked about their income in the preceding calendar year from multiple sources, including UI, SS, and private pensions.[5]

Another important attribute of the Annual Demographic File is that it obtains information on the labor market activity of respondents in the preceding calendar year, including weeks worked, usual hours worked per week, and weeks spent looking for work. Combining this retrospective information along with that obtained in the regular monthly survey, we define a retirement to occur when an older worker reports being in the labor force at any point during the preceding year, but is out of the labor force on the March survey date. We record workers as experiencing some unemployment if they reported looking for work at any point in the past calendar year. Receipt of UI is determined based on any income from UI in the preceding calendar year. We choose to condition the sample on a relatively weak definition of labor force attachment (any time in the labor force in the previous year, as opposed to working a certain number of weeks) in order to increase the chance that workers who lost their job will complete a spell of unemployment and make a retirement transition during the 15-month period for which we have labor market information.

As in Coile and Levine (2006a), we focus on workers between the ages of 55 and 69, who are more likely to retire in any given year. Despite the relatively small slice of the population that this group represents, the total sample sizes in the March CPS – 130,000 to 215,000 people per year, depending on the year – are large enough to provide us with a sample of nearly 300,000 older workers when we pool data from the 1980 through 2004 surveys.

[5] The Social Security income variable in the CPS includes Social Security Disability Insurance (SSDI) benefits; there is a separate question about disability income, which refers to private disability insurance income only. Research has shown that the UI receipt variable in the CPS captures 75 to 80 percent of actual UI receipt (Hotz and Sholz, 2002).

B. Matched March CPS Data

One potential problem with using the March CPS for our analysis is that our sample may include people with relatively weak labor force attachment, so that what we classify as a retirement transition may in fact be only a brief movement in and out of the labor force by someone with little work history. To address this concern, we construct an alternative data set, the matched March CPS, which uses the structure of the CPS to compile information on the labor market activity of each worker over a 27-month period.

To be more specific, each CPS respondent is surveyed for four consecutive months, then out for eight months, then back in the sample for four months. Thus any CPS respondents interviewed in a March as one of their initial surveys are also interviewed in the following March. Respondents provide the same information at each survey, so by linking two subsequent March surveys, we have contemporaneous information on labor market activity in the two survey weeks (periods t and t-1) as well as retrospective information for each year preceding a March survey (periods t-1 and t-2).

In our matched March CPS data set, we condition the sample on working 13 or more weeks in period t-2 and define a retirement transition to have occurred when the individual worked less than 13 weeks in year t-1 and is also out of the labor force on the survey date in period t. Assuming that weeks worked are consecutive starting at the beginning of the calendar year, this amounts to saying that individuals are working in March of t-2, not working at March of t-1, and out of the labor force at March of t. Our definition thus requires respondents to have not worked for at least 12 consecutive months to be counted as retired.[6] We define the worker to have experienced unemployment if he spends any weeks looking for work in t-1 or t-2 or if he is

[6] We consider a worker who meets our definition of retirement in the matched March CPS sample to have retired in year t-1. We also use the year t-1 values for the unemployment rate and measures of UI benefit generosity.

categorized as unemployed on the t-1 survey date. Similarly, he is recorded as receiving UI if any income from UI was received in t-1 or t-2.

These data also provide us with a mechanism for determining the reason an unemployment spell began for a subset of retirees. For individuals unemployed on a survey date, one can determine whether their unemployment spells began as a result of a lost or quit job or because the worker is a new or re-entrant to the labor force. Thus, for those workers in our sample who retired between year t-2 and year t and were also unemployed on the year t-1 survey date, we can identify the reason their unemployment spell began. We take advantage of this to provide an additional specification check to our results, as described subsequently.

In practice, matching responses for an individual across surveys is not perfect. Because the CPS is a household-based survey, there are no person-specific identifiers to enable the researcher to do the match directly. Moreover, individuals who move are not followed.[7] The basic framework for matching people involves matching household identifiers and then matching individuals within the household according to their characteristics. On average, roughly two-thirds of those eligible to be matched actually are matched.[8] Madrian and Lefgren (1999) describe alternative methods for conducting the match; we have adopted their preferred method.

In sum, the regular March CPS sample offers the advantage of a very large sample size, but may include some individuals with very weak labor force attachment in the sample and may not provide a long enough window to observe all transitions from work to unemployment to retirement. The sample size in the matched CPS is only about one-third that of the March CPS due to the matching issues discussed above. However, the matched CPS allows us to follow

[7] This potentially creates a sample selection problem because individuals who retire then move will be included among the unmatched. However, the regular March CPS, our primary data set, is not affected by this problem.
[8] We also note that because of structural changes in the survey, matches between the 1984 and 1985 surveys as well as the 1994 and 1995 surveys cannot be conducted. Thus, data from these years are not included in our sample.

workers for a longer period of time, enabling us to limit the sample to those with a stronger labor force attachment and to use a stronger definition of retirement. These data also enable us to determine the reason unemployment spells began for some workers experiencing unemployment on the way to retirement. We view the two data sets at complementary; while we rely more heavily on the March CPS, we also present some results using the matched CPS below.

C. Empirical Strategy

Our empirical analysis proceeds in two parts. The first question we examine is how labor market conditions affect retirement.[9] To assess this, we estimate regressions of the following form:

$$retire_{iast} = \beta_0 + \beta_1 unemrate_{st} + \beta_2 X_{ist} + \gamma_a + \gamma_s + \gamma_t + \varepsilon_{ist} \quad (1)$$

In this specification, *retire* is a dummy equal to 1 if individual i, at age a, living in state s, at time t retires and $unemrate_{st}$ is the unemployment rate in that state and year.[10] As described earlier, the two CPS data sets offer somewhat different retirement definitions. For the remainder of the paper, we ignore those distinctions and simply refer to a retirement transition as a generic concept.

Here and elsewhere in the model, X represents personal characteristics of the individual (race, education, marital status, and the presence of children under age 18), γ_s represents state-specific fixed effects, γ_t represents year-specific fixed effects, and γ_a represents age-specific fixed effects. These age fixed effects incorporate the different retirement propensities of individuals at

[9] In our analysis, we follow the previous literature and treat retirement as an absorbing state, ignoring the possibility of labor force re-entry. The March CPS does not allow us to identify re-entrants due to the short period over which we observe labor force behavior. In the matched March CPS, however, we are able to exclude labor force exits that are followed by rapid re-entry. A full analysis of labor force re-entry is beyond the scope of this project, but analyzing the effect of unemployment and UI on re-entry and the use of bridge jobs may be a fruitful area for future research.

[10] To measure the labor market conditions facing older workers as accurately as possible, one might like to use an age-specific unemployment rate. Unfortunately, the relatively small sample sizes in the CPS in smaller states do not allow for this to be reliably estimated at the state level.

different ages. Including them essentially converts this model into a discrete-time proportional hazards model of retirement, where the estimated values of γ_a at each specific age represent the baseline hazard. Models of retirement transitions of this type are estimated in Coile and Levine (2006a), Coile (2004a, 2004b) and Coile and Gruber (forthcoming). We estimate our regressions as linear probability models, but find results to be quite similar if we use probit models instead.

If unemployment acts as a constraint limiting the ability of older workers to remain in the labor force, we would expect the β_1 coefficient to be positive.[11] To help verify that this coefficient is picking up a causal effect of unemployment on retirement transitions, we estimate alternate versions of equation (1) where the dependent variable is defined as retirement accompanied by a period of unemployment and as retirement accompanied by a period of UI receipt. If a higher unemployment rate raises the probability of retirement, then we would expect it to also raise the probability of retiring with a period of unemployment and/or UI receipt.

The second question we address is whether government programs affect how workers respond to labor market shocks. Here, we wish to examine the role of both SS and UI.[12] Our test for the role of SS involves estimating how the effect of unemployment on retirement varies by age, which we do by interacting the unemployment rate with age group dummies.[13] We hypothesize that any sharp break in workers' response to unemployment at age 62 is likely

[11] Although we are presuming that retirements may increase in response to a higher unemployment rate (similar to a "discouraged worker effect" – DWE), it is also possible that retirements may decrease. This could happen if the threat of job loss for one individual leads his or her spouse to remain in the labor market beyond the point when they may choose to retire. This is similar to the notion of "added worker effect" (AWE). Empirical evidence for the AWE is mixed; see, for example, Lundberg (1985) and Speltzer (1997). Our estimates can be thought of as measuring the net effect of unemployment on retirement, incorporating both the DWE and AWE.

[12] It would also be interesting to explore whether DI receipt is cyclical. However, because we cannot directly identify receipt of SSDI income in the CPS, as noted above, we cannot use the CPS to explore this. Interestingly, Duggan et. al. (2006) find that take-up of the Veterans Affair's Disability Compensation program is cyclical.

[13] A broader life-cycle model would include kinks in the intertemporal budget constraint introduced by the availability of retirement benefits at particular ages as well as other program rules, such as the work eligibility requirements and benefit formulas for Social Security retired worker and disability insurance benefits. Estimation of such a structural model is beyond the scope of this paper. A fruitful area for future research is to build a retirement model that incorporates the role of labor market constraints along with other factors that have been more extensively studied, such as Social Security incentives.

attributable to workers' becoming eligible for SS at this age. This method has been commonly employed in the previous literature to determine the effect of SS on retirement; for example, see Kahn (1988), Hurd (1990), and Ruhm (1995), who all attribute spikes in the retirement hazard at age 62 to the effect of SS.

Next, we ask whether a more generous UI system reduces the likelihood of transitions into retirement. We define the generosity of a state's UI system along two dimensions – the benefit level and ease of meeting monetary eligibility requirements.[14] An older unemployed worker may search longer if that worker is receiving a larger UI benefit, which may forestall the decision to retire; if suitable employment can be found, that retirement decision may be prolonged even further. Thus one hypothesis we seek to test is the potential negative relationship between higher UI benefit levels and the likelihood of a retirement transition. In addition, the UI system is more likely to affect retirement transitions if a larger share of workers is monetarily eligible for UI benefits, so we test this hypothesis as well.

To this end, we estimate models of the form:

$$retire_{iast} = \beta_0 + \beta_1 \log(\max WBA)_{st} + \beta_2 shareeligible_{st} + \beta_3 unemrate_{st} + \beta_4 X_{ist} + \gamma_a + \gamma_s + \gamma_t + \varepsilon_{ist} \quad (2)$$

where maxWBA is the maximum weekly benefit amount that a UI recipient can collect in a particular state/year. The $shareeligible_{st}$ variable measures the share of the state's work force

[14] Although benefit levels and monetary eligibility rules are probably the most important components of the UI program, there are other program provisions that may play a role in retirement transitions. For instance, beginning in the mid-1990s, a handful of states began to offer a "self-employment assistance" program that enables UI recipients to receive UI benefits in a lump-sum in order to start up a small business. Since older workers transitioning to retirement may find a period of self-employment desirable, such a program may have relevance for them. Nevertheless, our analysis of these programs found no systematic relationship. In addition, rules allowing workers to collect UI while searching for part-time work only may also enhance the program's usefulness to some older workers. Unfortunately, our survey of the regulations only turned up documentation on state differences in these policies beginning in the mid-1990s. Before that, we were unable to verify what states had what types of policies in this regard. As a result, we are unable to examine this possibility in our econometric analysis. Similarly, states may vary in the stringency of their job search requirement for UI recipients, but we are also unable to explore this in our analysis.

that satisfies the monetary eligibility requirements for UI benefit receipt at time t. Since this will depend not only on the state's eligibility rules but also on the characteristics of workers, we use a simulated measure of eligibility that is generated by running a common sample of individuals through the eligibility rules in each state and year.[15] This approach is useful in that it provides a systematic measure of the generosity of a state's eligibility rules at a point in time and is unrelated to the characteristics of the individual.

This model represents a reduced form specification of a structural model where the retirement rate depends upon the replacement rate than an individual worker receives. Since an individual's replacement rate is endogenous to his past labor market activity, the maximum weekly benefit amount would serve as an appropriate instrumental variable. This reduced form approach is a more parsimonious specification of this relationship that focuses on the plausibly exogenous variation in a state-set policy parameter.

There are, of course, other potential sources of bias in this parameter estimate. Since our approach relies on state-specific variability, geographical differences in labor market attributes may be related to success in the labor market and to the process of setting maximum benefit amounts. To the extent that these differences are long-standing in nature, we can account for them by including state-fixed effects in our model. Similarly, national trends over time may be related to both retirement patterns as well as the generosity of UI benefits, so we also include year-specific fixed effects. Thus, our identification is based on variation in the maximum

[15] Specifically, we use a random sample of 5,000 March CPS respondents age 55-69 from 1979 to 2003 who spent time looking for work last year and were unemployed for less than 26 weeks on the survey date (to avoid those who had exhausted their benefits). The mean rate of monetary eligibility for this sample (73%) is based on all unemployed workers, not just job losers, whose rate of eligibility would be higher. See Levine (2006) for details regarding the simulation method.

weekly benefit amount within states over time and our key identifying assumption is that such changes are exogenous to retirement behavior. [16]

IV. RESULTS

A. Descriptive Analysis

In this part of the paper we present a descriptive analysis regarding the roles that unemployment spells and unemployment insurance receipt play in retirement transitions. Figure 1 relies on March CPS data and shows the annual retirement hazard for workers age 55 to 69 over the past twenty-five years, with shading to indicate the timing of recessions.[17] Overall, the figure shows a recent downward trend in retirement. Any possible increase in retirement during recession years is swamped by the general downward trend and noise in the year-to-year estimates.

Figure 2 examines the relative frequency of various paths to retirement in the March CPS by showing the share of retirements that occur with unemployment and with UI receipt. In contrast to the overall retirement rate shown in Figure 1, the share of workers retiring with a spell of unemployment or of UI receipt does display a cyclical pattern, with the spikes often occurring just after the official end of the recession. Another interesting thing to note from Figure 2 is that twice as many workers retire with a spell of unemployment, roughly 12 percent over the years, as do with a spell of UI receipt.

[16] "Policy endogeneity" is one criticism that is sometimes made in models like this (Besley and Case, 2000). The potential problem is that the state may set its policies in response to labor market conditions, perhaps lowering maximum weekly benefits when unemployment rates are high to save money. If retirements increase during recessions, this would generate a spurious negative relationship between maximum weekly benefits and retirements. Although this is a reasonable concern, Levine (2006) shows that states tend to respond to the financial stress that a recession places on the UI system by raising taxes rather than by lowering benefits.

[17] The definitions of when a recession begins and ends are based on the determination of the National Bureau of Economic Research and are based on movements in GDP. It is common for labor market peaks and troughs to lag behind the cyclical movements in GDP.

More direct information from the March CPS and the matched March CPS on the extent to which spells of unemployment are accompanied by UI receipt is shown in Table 1. Approximately 11 to 12 percent of retirement transitions for those 55-69 include a spell of unemployment and about 6 to 7 percent include a spell of UI receipt. It is important to note, however, that only 3 to 5 percent of retirements included a spell of unemployment along with UI receipt. This means that a reasonably large number of older workers appear to transition to retirement with no unemployment, but still manage to collect UI benefits. Alternatively, the labor market measures available to us over the relevant time window may not be sufficient to capture all periods of unemployment. The lower panel of the table presents comparable statistics for the subsample of workers aged 62-65. Although retirement rates are naturally higher at these ages, the remainder of the results is comparable to those for the full sample of workers age 55-69. The frequency of retirement transitions that involve spells of UI receipt, reported in Table 1, is similar in the U.S. to that in some other developed nations, as described earlier.

Finally, using the matched CPS data, we are able to calculate the retirement rate by source of unemployment – layoff, quit, or new/re-entrant to the labor force – for those who reported being unemployed at the t-1 survey date. As indicated in the table, nearly three-quarters of unemployed older workers have been laid off, almost one-fifth have quit, and less than one in ten are new or re-entrants to the labor force.

B. Cyclical Sensitivity of Retirement

The first row of Table 2 presents the results of estimating equation (1) for the March CPS and matched CPS samples. The coefficients and standard errors shown on the table have been multiplied by 10, so that these numbers reflect the effect of a 10 percentage point increase in the unemployment rate. In our discussion, we focus on the effect of a 3 percentage point increase,

which corresponds roughly from moving from a period of expansion to recession. In the March CPS, a 3 percentage point increase raises the probability of retirement by .006 percentage points (as a 10 percentage point increase raises it by .0198), which is 4.6 percent relative to the mean retirement rate of 13 percent. The effect is statistically significant. The coefficient from the matched March CPS is very similar and is also statistically significant.[18]

The second and third rows in this table represent specification checks designed to strengthen our causal interpretation of these results. These rows explore whether a higher unemployment rate is associated with a higher probability of retirement accompanied by unemployment or UI receipt. If recessions cause retirements, then those retirements should be more likely to be accompanied by a spell of unemployment or UI receipt. The results of our analysis support this hypothesis. Both coefficients are highly statistically significant. Moreover, because linear probability models estimate a percentage point change in the outcome measure, one can read the March CPS coefficients as saying that the vast majority of the retirement response to the unemployment rate (.0189 out of .0198) occurs through retirement transitions that include a spell of unemployment. A similar comparison for UI receipt yields a somewhat lower estimate (.0091 out of .0198), which is not surprising given that not all unemployed workers are UI-eligible or will choose to take up UI. Results from the matched March CPS are qualitatively similar, albeit somewhat less precise.

The remaining rows of Table 2 are designed to provide an additional specification check by considering the reason that unemployment spells began for those who transition to retirement through unemployment (this analysis can only be conducted using the matched March CPS). If cyclical factors are responsible for greater rates of retirement, then we would expect that workers

[18] We have also explored whether the cyclicality of retirement behavior varies by demographic group using the March CPS. We find stronger effects of the unemployment rate on retirement for women and for high school graduates.

who experience an unemployment spell to be more likely to have begun that spell because of a layoff. We also might expect "retirements" to occur among unemployed workers who are new and re-entrants to the labor force who become discouraged in their job search if jobs are scarce. We would also anticipate that the cyclical responsiveness of this path to retirement would be less than that associated with layoffs. On the other hand, we would expect transitions to retirement with quit-related unemployment to be unrelated to the unemployment rate or perhaps even counter-cyclical, as workers frustrated with their jobs may be less likely to quit when the economy is weak.

Indeed, the results in the remainder of Table 2 confirm our hypotheses in this regard. In the fourth row of the table, we restrict the definition of unemployment to include those workers who were unemployed on the March survey date in year t-1 (labeled "unemployment II") because these are the workers for whom we can identify the reason their unemployment spell began. Not surprisingly, fewer retirement transitions include an unemployment spell using this restricted definition of unemployment. Nevertheless, we still see that transitions of this type are cyclically sensitive. The remaining three rows of the table separately examine retirement transitions through unemployment instigated by layoffs, quits, and workers who have just entered or re-entered the labor force. The results obtained here are consistent with our hypotheses, with positive and significant coefficients on the unemployment rate for those who are laid off or new/re-entrants and a negative but insignificant coefficient for quitters.

We conclude from our analysis that there is strong evidence of a causal relationship between labor market conditions and retirement. But how large is this effect? In particular, how does it compare to the estimated magnitudes of factors like SS incentives and health shocks, which have received a great deal of attention in the previous literature, in determining retirement behavior?

As described earlier, our estimates suggest that a recession that results in a three percentage point increase in the unemployment rate will increase the retirement rate by 0.6 percentage points, or roughly 5 percent relative to the baseline retirement rate. This estimate is comparable to that obtained for SS and health shocks. For instance, Coile and Gruber (forthcoming) estimate that a $10,000 increase in SS wealth raises the probability of retirement by 4 percent relative to the mean retirement rate and that a $1,000 increase in the return to additional work through the SS and pension systems lowers retirement by 1 percent.[19] Comparing these estimates to the impact of health shocks is complicated by the fact that studies examining their impact concentrate on the effect on the individuals experiencing the shock rather than the aggregated effect that relies on an increase in the risk of experiencing such a shock. The latter approach is consistent with our analysis of labor market shocks. As a point of comparison, Coile (2004b) finds that a heart attack, stroke, or new cancer diagnosis raises the probability of retirement by 87 percent relative to the mean for men and by 51 percent for women, but these events occur for 6.7 percent of men and 5 percent of women over a two year period. This means that the aggregate impact associated with the threat of such a health shock is a 6 percent reduction in retirement rates relative to the mean for men and a 3 percent reduction for women. These are comparable to our estimates of the impact of a recession.

C. Role of Government Programs

We begin to assess how government programs affect workers' responses to labor market shocks in Table 3. In these specifications, we allow the effect of the unemployment rate on retirement to vary by age by including the unemployment rate as well as interactions between it and various age group dummies (58-60, 61, 62-64, 65-67, and 68-69; implicitly, 55-57 is the

[19] For reference, the median Social Security wealth among households headed by male workers aged 60 years old is about $100,000, while the median accrual for this group of workers is about $650.

omitted group).[20] Here we find a striking pattern. The uninteracted unemployment rate coefficient is insignificant, as is the interaction with the age 58-60 dummy. Starting at age 62 (or perhaps even at age 61), however, the interaction terms become positive and significant.[21] The timing of this effect may actually begin at age 61 because individuals who lose their jobs during a recession are able to make do with UI benefits or their own savings for a short time before SS benefit eligibility. Alternatively, this may result from the difficulties in precisely estimating a worker's age at the time of retirement. Regardless, these results suggest that the ability of workers to respond to labor market shocks by retiring is highly dependent on their access to SS benefits, since age 62 is the age of first eligibility for SS.[22]

We know from Table 2 that labor market constraints affect retirement transitions and from Table 3 that SS appears to affect how workers respond to them, but what role does UI play? We explore this question in Table 4. The specifications displayed here are comparable to those in Tables 2 and 3, except that we add two right hand side variables to capture the generosity of the UI system: the log of the maximum weekly UI benefit amount and the simulated share of workers eligible for UI.[23] We expect a negative effect of UI benefits on retirement, as a more generous UI benefit may lead workers to take up UI and delay onset of retirement and benefit claiming for the

[20] We have also estimated models where the unemployment rate is interacted with single age dummies. The results were analogous to those described here, but somewhat noisier since there are fewer people in each single age cell.

[21] Using the matched March CPS data, we have also experimented with a retirement definition based on "social security claiming," defined as SS receipt in year t-1, but not in year t-2. In that analysis, we similarly find a cyclical pattern starting at age 62, but the coefficients are less precisely measured.

[22] We recognize that it is difficult to definitively prove the role of SS in workers' responses to labor market shocks, since there is no variation across individuals in the age of SS eligibility. However, it is difficult to imagine what else aside from SS could produce the striking change in workers' responsiveness to labor market shocks at age 62, since there are no other known events at this age that would affect retirement. As noted above, the previous literature has attributed spikes in the retirement hazard at age 62 to the effect of SS.

[23] In keeping with our focus on retirement, we continue to define the dependent variable as a transition to retirement. Alternatively, looking at the effect of UI on SS claiming could be of interest because claiming may be considered an alternative retirement definition and because there may be program interactions between UI and SS. Program interactions are an important and understudied area; see Neumark and Powers (2005) and Mitchell and Phillips (2000) for two notable exceptions. We conducted such an analysis, limiting the sample to those age 61 and above for whom SS claiming is an option, but failed to find statistically significant effects of UI generosity on claiming.

duration of UI receipt and also may allow workers the time to find a new job, delaying retirement still further. We also expect a negative effect of the share eligible on retirement, as fewer workers may transition to retirement if more of them are eligible for UI.

In the first column, we fail to find a negative and significant effect of either the UI benefit level or share eligible for UI on retirement. Since the generosity of UI may matter more when the unemployment rate is higher, in the second column we interact the UI generosity measures with the unemployment rate, but fail to find negative and significant coefficients on the interaction terms. Finally, when we interact these measures of UI generosity with age (Column 3), we do find some negative coefficients on these interaction terms starting at age 62, as expected. However, once the main effect is added to the interaction term, the implied effect of the UI system on retirement is typically near zero. For example, the total effect of a 10 percent increase in the maximum weekly benefit amount in the March CPS is to lower retirement among those age 62 to 64 by .0009 (.0348 less .0357). For the share eligible, the total effect at age 62-64 is negative, but this is not true at any other ages. Overall, we find weak evidence at best that more generous UI benefits enable older workers to delay retirement.

The results in Table 4 are somewhat puzzling because past work has found that UI incentives have played a significant role in explaining take-up rates and unemployment durations. Do these incentives matter less for older workers or is the impact on retirement simply different than that found for these other behaviors? To investigate this question, we used the March CPS data to estimate models that approximate UI take-up and unemployment duration. We relate the log of the maximum weekly UI benefit in a respondent's state and year to an indicator of take-up (the likelihood of collecting UI among those who experience some unemployment) and an indicator of spell duration (weeks spent looking for work in the last calendar year among those

experiencing some unemployment). [24] We examine these outcomes for the same sample of 55-69 year old workers as we have been focusing on, but we also replicate the analysis for workers younger than that (age 21-54) to see if there is a difference between age groups.

The results of this analysis are presented in Table 5. For younger workers, we find that benefit generosity and more lenient eligibility rules are both positively associated with UI receipt, while only the UI benefit level is positively associated with the duration of unemployment, which is all consistent with the previous literature and our expectations. For older workers, however, the effect of both measures of UI generosity on receipt is negative and insignificant, while the effect of UI benefit level on duration is positive, significant, and larger than for younger workers. We believe the duration results may be consistent with a story where older workers on UI do not look as hard for new jobs as younger workers; for them, UI benefits may be simply a source of income, rather than a means to make a better job match. Regardless, the fact that UI receipt does not seem to be affected by UI generosity for older workers is consistent with the lack of a retirement response to such changes.

V. CONCLUSIONS

This study has explored how unemployment affects retirement and whether the UI system and access to SS affect workers' responses to labor market shocks. We have two principal findings. First, we find that retirement transitions are cyclically sensitive. The magnitudes of these effects are similar to those associated with moderate changes in financial incentives to retire and to the threat of a health shock to which older workers are exposed. Second, we find that SS interacts

[24] Past work in this area has been able to identify take-up as the receipt of benefits among UI eligible workers, but we do not have access to UI eligibility. Similarly, duration models have typically taken advantage of data that enables the researcher to follow spells of unemployment in a hazard framework, but we do not have data of that form either. We only use the March CPS for this analysis because the matched March data has the same information with smaller sample sizes than the regular March CPS data.

with labor market conditions in affecting retirement transitions, as the effect of the unemployment rate on retirement transitions appears only as workers near or reach the age of eligibility for SS benefits. Although we predicted that more generous UI benefits would be associated with a reduced probability of retirement, we find no consistent evidence of this.

We believe that the primary contribution of this paper is to raise awareness that labor market conditions are an important determinant of retirement transitions. As such, policy discussions regarding retirement behavior need to consider this factor along with others that have previously received more attention, such as health status and the financial incentives from SS and private pensions. For instance, consider the current debate regarding raising the SS early retirement age (ERA). Opponents of an ERA increase argue that it would harm those workers who are in poor health and cannot easily delay retirement. Yet other older workers who face a weak labor market may also have difficulty delaying their retirement. Our results suggest that both groups of workers may be similarly affected by a change in the ERA. To the best of our knowledge, the debate has ignored the problems of this second group of workers. More broadly, we believe that economists and policy makers should pay more attention to the effect of labor market conditions on retirement decisions and the well-being of older workers.

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Table 1: Paths to Retirement

	March CPS	Matched March CPS
	Ages 55-69	
Retirement Rate	13.0	11.7
% with Unemployment	11.9	11.3
% through Layoff	---	73.6
% through Quit	---	7.5
% through New/Reentrant	---	18.9
% with UI Receipt	6.1	7.4
% with Unemployment and UI	3.3	4.9
	Ages 62-65	
Retirement Rate	21.4	19.2
% with Unemployment	9.8	9.7
% through Layoff	---	74.5
% through Quit	---	4.6
% through New/Reentrant	---	20.9
% with UI Receipt	6.0	6.9
% with Unemployment and UI	3.2	4.3

Note: The percentage of unemployment spells with a specific cause of unemployment is calculated for the sample of workers who were unemployed on the March survey date in year t-1. Data are pooled for the years 1980 through 2004.

Table 2: Cyclical Sensitivity of Retirement, by Type of Retirement Transition
(standard errors in parentheses)

	March CPS		Matched March CPS	
	Mean	Coeff/s.e.	Mean	Coeff/s.e.
Retire	0.130	0.0198 (0.0078)	0.1166	0.0220 (0.0112)
Retire with Unemployment	0.016	0.0189 (0.0025)	0.0131	0.0121 (0.0058)
Retire with UI Receipt	0.008	0.0091 (0.0018)	0.0087	.0118 (.0038)
Retire with Unemployment II	---	--- ---	0.0059	0.0073 (0.0033)
Retire with Unemployment Through Layoff	---	--- ---	0.0044	0.0046 (0.0025)
Retire with Unemployment Through Quit	---	--- ---	0.0012	-0.0007 (0.0007)
Retire with Unemployment Through New/Re-Entrant	---	--- ---	0.0005	0.0033 (0.0013)

Notes: Estimates and standard errors are all multiplied by 10 and are obtained from linear probability models that also include: race, education, marital status, and the presence of children under age 18, along with a full array of state and year dummy variables and age dummy variables for ages 56-69. The sample size for the March CPS sample is 278,641 and for the matched March sample is 83,005. Standard errors are clustered at the state level. Data are pooled for the years 1980 through 2004.

Table 3: Cyclical Sensitivity of Retirement by Age
(standard errors in parentheses)

	March CPS	Matched March CPS
Mean of Dep. Variable	0.130	0.117
Unemployment rate	-0.0080	-0.0103
	(0.0084)	(0.0116)
Unemployment Rate* Age 58-60	0.0099	0.0039
	(0.0096)	(0.0099)
Unemployment Rate* Age 61	0.0508	0.0403
	(0.0119)	(0.0223)
Unemployment Rate* Age 62-64	0.0517	0.0567
	(0.0139)	(0.0184)
Unemployment Rate* Age 65-67	0.1010	0.1328
	(0.0170)	(0.0218)
Unemployment Rate* Age 68-69	0.0257	0.1111
	(0.0245)	(0.0352)
Number of Obs.	278,641	83,005

Notes: Estimates and standard errors are multiplied by 10 and are obtained from linear probability models that also include: race, education, marital status, and the presence of children under age 18, along with a full array of state and year dummy variables and age dummy variables for ages 56-69. Standard errors are clustered at the state level. Data are pooled for the years 1980 through 2004.

Table 4: The Role of the Unemployment Insurance System in Retirement Transitions
(standard errors in parentheses)

Unemployment Rate	0.0169	0.0709	0.0169
	(0.0082)	(0.1776)	(0.0081)
Log Max. UI Benefit	0.0192	0.0277	0.0348
	(0.0105)	(0.0190)	(0.0122)
Log Max. UI Benefit* Unemployment Rate		-0.0120	
		(0.0252)	
Log Max. UI Benefit*Age 58-60			-0.0064
			(0.0075)
Log Max. UI Benefit*Age 61			-0.0103
			(0.0128)
Log Max. UI Benefit*Age 62-64			-0.0357
			(0.0145)
Log Max. UI Benefit*Age 65-67			-0.0454
			(0.0152)
Log Max. UI Benefit*Age 68-69			-0.0447
			(0.0235)
Simulated Monetary Eligibility (SME)	0.0016	-0.0133	0.0291
	(0.0218)	(0.0626)	(0.0299)
SME*Unemployment Rate		0.0187	
		(0.1017)	
SME*Age 58-60			-0.0132
			(0.0230)
SME*Age 61			0.0150
			(0.0569)
SME*Age 62-64			-0.1224
			(0.0595)
SME*Age 65-67			0.0165
			(0.0767)
SME*Age 68-69			-0.0555
			(0.0763)

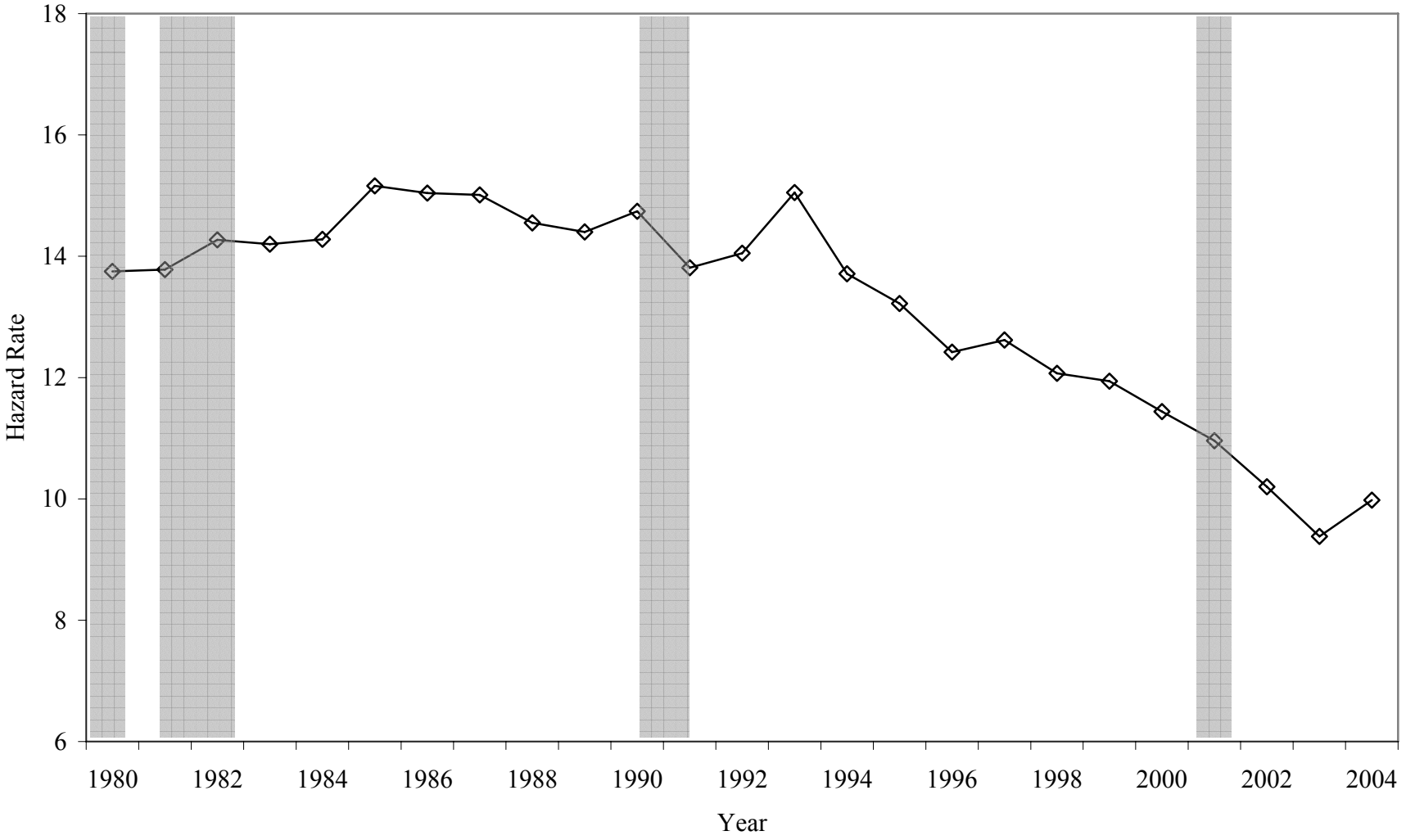
Notes: Estimates are obtained using March CPS data and linear probability models that also include: the unemployment rate, race, education, marital status, and the presence of children under age 18, along with a full array of state and year dummy variables and age dummy variables for ages 56-69. Standard errors are clustered at the state level. Data are pooled for the years 1980 through 2004.

Table 5: The Impact of UI Generosity and Eligibility Rules on UI Receipt and Duration of Unemployment (standard errors in parentheses)

	Any UI Receipt in Calendar Year		Weeks Unemployed in Calendar Year	
	Age 21-54	Age 55-69	Age 21-54	Age 55-69
Log Max UI Benefit	0.064	-0.020	0.096	0.237
	(0.024)	(0.035)	(0.030)	(0.100)
Simulated Monetary Eligibility	0.087	-0.119	0.034	0.108
	(0.027)	(0.104)	(0.048)	(0.171)
Number of Obs.	204,502	19,280	204,502	19,280

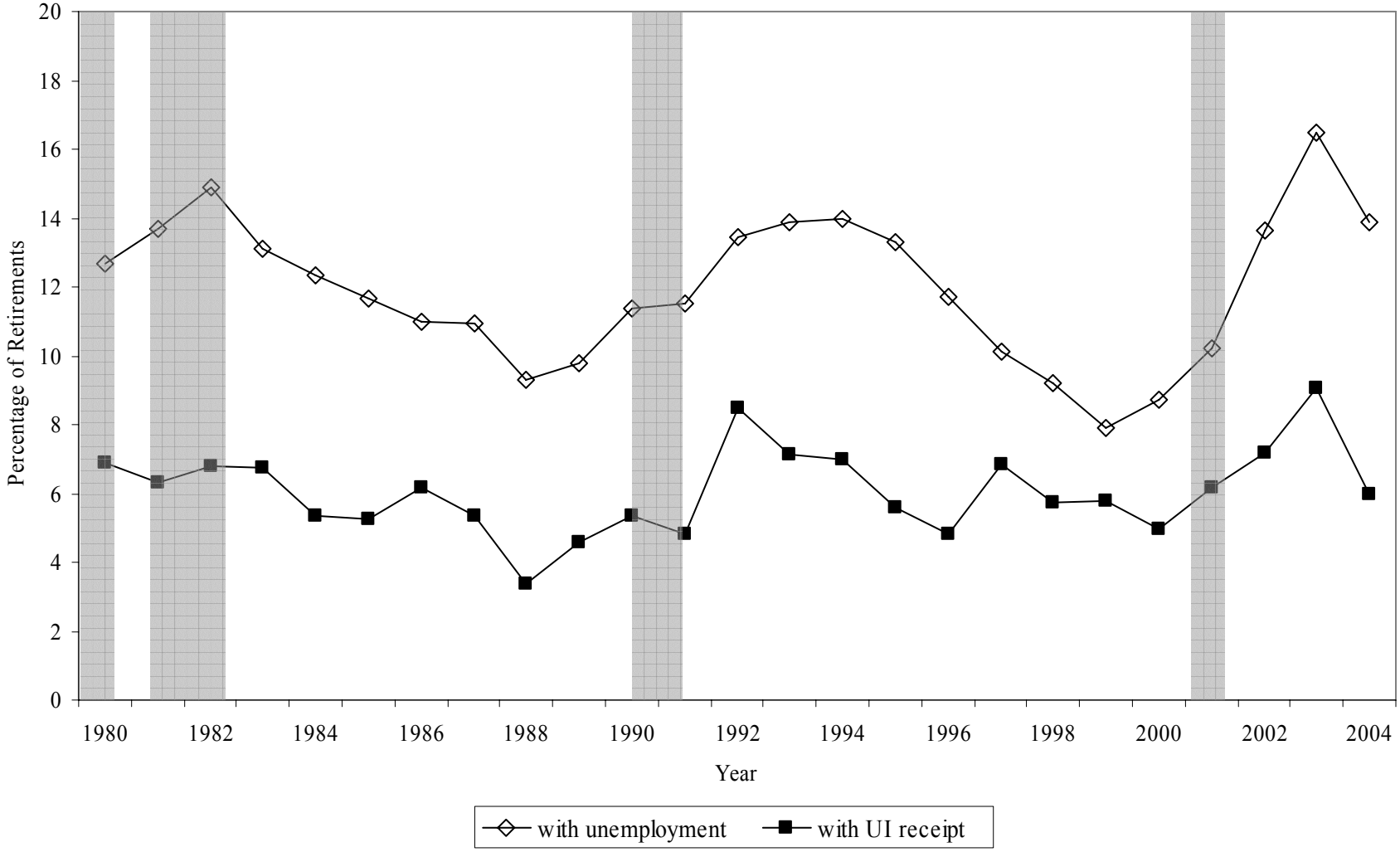
Notes: Estimates are obtained using March CPS data and linear probability models that also include: the unemployment rate, race, education, marital status, and the presence of children under age 18, along with a full array of state and year dummy variables on a sample of workers experiencing some unemployment. Age dummy variables for ages 56-69 and unemployment rate*age interactions for ages 55-59 and ages 66-69 are also included, but are not reported here. Standard errors are clustered at the state level. Data are pooled for the years 1980 through 2004.

Figure 1: Retirement Hazard Rates, Ages 55-69



Source: Authors' calculations from March Current Population Surveys.
Notes: shaded regions represent recessions, as defined by the National Bureau of Economic Research.

Figure 2: Paths to Retirement in March CPS, Ages 55-69



Source: Authors' calculations from March Current Population Surveys.
Notes: shaded regions represent recessions, as defined by the National Bureau of Economic Research.