Health Insurance and Early Retirement Plans: Evidence from the Affordable Care Act

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January 2017

Abstract

Employer sponsored retiree benefits are an important source of health insurance for millions of retirees, but offer rates have been steadily declining since the early 1990s. Access to affordable insurance during retirement can play an important role in the labor supply decisions of older adults. In this study, I examine the impact of the 2010 Affordable Care Act (ACA) on the retirement plans of older adults. The ACA includes several provisions that are expected to significantly increase access to affordable insurance that is not tied to employment. Using data from the Health and Retirement Study, I find that the ACA decreased the subjective probability of working past age 62 by 5.6 percentage points, representing a 9.9 percent decline, among persons without employer sponsored retiree coverage relative to persons with employer sponsored benefits. On average, individuals expect to retire about 3.6 to 7.2 months earlier due to the ACA. Persons who are somewhat unsure whether they will continue to work past age 62 are the most responsive to the policy change while individuals who are very sure that they will either retire by age 62 or will continue to work are less responsive, suggesting that the ACA also reduced uncertainty regarding the timing of retirement.

Keywords: Employer Sponsored Retiree Health Insurance; Affordable Care Act; Subjective Retirement Expectations; Job Lock

JEL Classification Codes: H31, I13, I18, J22, J26

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I am grateful to David Frisvold, Daifeng He, Helen Levy, Adriana Lleras-Muney, Michael Richards, Martin Salm, participants at the Southeastern Health Economics Study Group and seminar participants at the University of Iowa for very helpful discussions and comments.

1. Introduction

Employer sponsored retiree health benefits are an important source of insurance for millions of retirees, covering 45% of retirees aged 55 to 64 years in 2012 (McArdle *et al.* 2014). Employer sponsored benefits are also an important source of supplemental coverage for Medicare-eligible retirees, with nearly one in three Medicare beneficiaries having an employer sponsored plan (McArdle *et al.* 2014). However, since the early 1990s there has been a steady erosion of retiree benefits. The share of large employers (200 or more workers) offering retiree benefits to their workers declined from 66% in 1988 to 23% in 2015.¹ These declines coupled with increasing healthcare costs have important implications for the labor supply and retirement security of older workers.

In general, employer sponsored insurance is substantially cheaper than insurance purchased in the individual market, which can have high premiums due to adverse selection. Older adults with chronic conditions, in particular, may face very high premiums in markets that do not use community rating. Therefore, some individuals who would prefer to retire may continue working in order to keep access to employer sponsored health insurance, a phenomenon commonly referred to as "job lock". Access to retiree benefits from a former employer can reduce job lock and encourage early retirement. A large literature has evaluated the impact of retiree health insurance on the retirement decisions of older workers, with most studies finding that the availability of insurance increases the likelihood of early retirement (see, for example, Strumpf (2010); Nyce et al. (2013); Fitzpatrick (2014); Shoven and Slavov (2014)).² The 2010 Affordable Care Act (ACA) is expected to influence labor supply by significantly expanding access to affordable insurance. While the ACA includes several provisions specifically meant to encourage employer provision of retiree benefits, provisions such as the expansion of the Medicaid program and establishment of insurance exchanges are expected to increase workers' access to insurance that is not tied to employment and to lower premiums in the individual market, potentially reducing job lock.

¹ Source: Exhibit 11.1, 2015 Employer Health Benefits Annual Survey, KFF/HRET, <u>http://kff.org/report-section/ehbs-2015-section-eleven-retiree-health-benefits/</u>, accessed 6/5/2016.

 $^{^{2}}$ Evidence on job lock for other populations is more mixed. For example, Baicker *et al.* (2014) find no impact of the Oregon Medicaid program on the labor supply of non-elderly persons while Garthwaite *et al.* (2014) find large impacts of the Tennessee Medicaid program on childless adults. See Gruber and Madrian (2002) for a review of the literature on job lock.

In this study, I examine the impact of the ACA on the early retirement plans of older workers. Specifically, I use data from the Health and Retirement Study (HRS) on the subjective probability of continuing full time work past age 62. This measure is only available for current workers who are younger than age 62. Therefore, this study evaluates the extent to which current workers change their plans about retirement at a future date in response to the ACA. Several reasons motivate the focus on subjective retirement expectations. For health care reform to influence retirement behavior it has to first affect workers' plans to retire at a specific age. Given the complex set of factors that influence retirement decisions (health, insurance, Social Security benefit rules, wealth etc.), it is plausible that individuals do not immediately adjust their labor supply in response to policy changes but instead slowly revise their plans about retirement at future ages over time. Subjective expectations data allow me to identify early responses to the ACA which would not be evident in observed retirement data. Indeed, Levy et al. (2015) examine the impact of the ACA on retirement among persons aged 55 to 64 years using data from the 2005 to 2015 monthly Current Population Surveys.³ They find no evidence of a break in retirement trends around 2014 and no evidence that state Medicaid expansions affected retirement. In contrast to the work by Levy et al. (2015), I examine the overall impact of the law on plans about retirement at future ages.

It is also important to understand how workers plan for retirement and whether these plans are updated in response to public policy, given that retirement expectations have important implications for the wellbeing of older workers. Consumption, savings and investment decisions of older workers are based on expectations about the future, with the expected retirement age and amount of time spent in retirement playing an important role (Haider & Stephens 2007). Moreover, these expectations provide information on the extent to which retirement is voluntary versus involuntary, which has implications for the wellbeing of retirees and for subsequent returns to work or "unretirement" (Maestas 2010). Thus, in addition to providing information on job lock, this study contributes to a growing literature evaluating the accuracy of subjective retirement expectations and the factors that influence the evolution of these expectations

³ Other studies have evaluated the impact of the ACA's Medicaid expansions on the labor supply of non-elderly persons. For example, Kaestner *et al.* (2015) focus on non-disabled persons aged 22 to 64 years with a high school education or less while Frisvold and Jung (2016) examine the labor supply of poor, childless adults and poor parents separately. Both studies find no evidence of an impact on employment.

(Bernheim 1987; Disney & Tanner 1999; Chan & Stevens 2004; Benitez-Silva & Dwyer 2005; Coppola & Wilke 2014).

To identify the causal effect of the ACA on the retirement plans of older workers, I employ a difference-in-differences (DD) approach that compares persons with and without employer sponsored retiree benefits prior to the ACA. I find a significant decline in the subjective probability of working past age 62 among persons without employer sponsored retiree benefits compared to persons with retiree coverage. The estimates imply that the expected retirement age is lower by 3.6 to 7.2 months, on average. In addition to estimating the effect on the mean, I evaluate the impact of the ACA on the full distribution of subjective probabilities using quantile regression methods. I find larger effects at the median than at the tails of the distribution, suggesting that heath reform also decreased uncertainty regarding the timing of retirement. This finding is an important contribution to the literature on insurance and retirement, which has mainly focused on average changes in the probability of retirement at any given age or in the expected retirement age.

The rest of the paper proceeds as follows. Section 2 presents a brief background on the ACA, specifically discussing provisions that are expected to impact retirees. Section 3 presents a conceptual framework on the economics of job lock and discusses the mechanisms by which the ACA may affect labor supply. Section 4 describes the data and section 5 presents the econometric methodology. Section 6 presents the results and section 7 concludes.

2. The Affordable Care Act

The ACA was signed into law on March 23, 2010 and includes several provisions aiming to improve access to affordable health insurance for all Americans.⁴ Some of these provisions are specifically targeted towards retirees. For example, the ACA included a temporary program, the Early Retirees' Reinsurance Program, which provided \$5 billion in total funds to retiree plan sponsors with the purpose of stabilizing retiree coverage. Under this program, plan sponsors were reimbursed for 80% of medical claims between \$15,000 and \$90,000 for early retirees aged 55-64 years and their spouses, surviving spouses and dependents. The program was initially scheduled to end by January 1, 2014 but demand quickly outpaced available funding and the

⁴ See <u>http://kff.org/health-reform/fact-sheet/summary-of-the-affordable-care-act/</u> for a summary of the ACA.

program stopped accepting applications on May 6, 2011 (McArdle *et al.* 2014). Retiree only plans (i.e. plans with less than 2 active employees) are also exempt from many of the expensive ACA requirements that apply to all other plans. For example, retiree only plans do not have to extend coverage to dependents up to age 26; they also do not have to remove annual or lifetime dollar limits on essential health benefits or cover preventive services with no cost sharing (McArdle *et al.* 2014). Although these provisions are meant to encourage employers to continue to offer retiree benefits to their workers, offer rates have continued to decline steadily.⁵

Perhaps more important for the labor supply decisions of older adults are the broad provisions in the ACA that improve access and coverage for all individuals. Beginning in 2014, individuals who can afford insurance are required to buy coverage, or pay a penalty (individual mandate). In 2016, the penalty is the higher of \$695 or 2.5% of household income. The establishment of health insurance marketplaces or exchanges addresses market failures in the individual market, which was characterized by high premiums, meager benefits and high rates of coverage denials prior to the ACA. Plans offered on the exchanges must meet minimum benefit standards (in terms of actuarial values and coverage of essential health benefits) and can no longer deny coverage or increase premiums based on pre-existing health conditions. Plans must also use adjusted community rating and cannot charge older enrollees more than three times the premium charged to a younger enrollee for the same plan. The exchanges pool risk, standardize plans and promote price competition among insurers, potentially reducing the price of insurance in the individual market.

Further, the ACA provides substantial subsidies for low income individuals through the exchanges and the expansion of the Medicaid program. Individuals with income between 100% and 400% of the Federal Poverty Line (FPL), who do not have access to Medicaid or employer sponsored coverage, are eligible for premium subsidies to purchase insurance on the Marketplaces. Individuals with income between 100% and 250% of FPL are also eligible for cost-sharing subsidies. The subsidies are determined on a sliding scale with higher income persons receiving smaller subsidies. In 2016, about 83% of marketplace enrollees qualified for premium subsidies which covered 72% of the premium on average (Gabel *et al.* 2016). After tax

⁵ See Exhibit 11.1 of the KFF/HRET 2015 Employer Health Benefits Annual Survey: <u>http://kff.org/report-section/ehbs-2015-section-eleven-retiree-health-benefits/</u>.

credits, the average premium was \$113 per month (Gabel *et al.* 2016). In addition, new federal funds are available to states that choose to expand their Medicaid program to cover all adults with income less than 138% of FPL. As of March 2016, 31 states and the District of Columbia have undertaken an expansion of their Medicaid program. These changes are expected to reduce the relative price of insurance in the non-group market and increase access to public insurance, with low income persons experiencing the largest gains.

3. Conceptual Framework

Although workers face compensating wage differentials for employer sponsored insurance, trading off higher wages for health benefits, several factors make employer sponsored insurance particularly attractive. As discussed by Gruber and Madrian (2002), employers are typically not able to set employee specific compensation packages and large employers benefit from huge economies of scale in insurance purchase, allowing workers to extract rents from jobs with employer sponsored insurance. Further, due to adverse selection, insurance in the individual market was very expensive prior to the ACA, often prohibitively so, for older worker who may have pre-existing health conditions. This implies that a relatively unhealthy older person benefits from working at a firm that offers insurance. This is true even if that person's value of leisure exceeds their marginal product of labor. Essentially, an individual trades off the marginal product of labor and the value of employer sponsored insurance against the value of leisure and insurance from the individual market. Gruber and Madrian (2002) note that this is a form of "job lock".

An implication of job lock is that persons who have employer sponsored retiree coverage will, in general, be more likely to retire early than persons without employer sponsored retiree coverage. The ACA influences retirement decisions by potentially decreasing the relative price of insurance in the individual market. For the marginal worker without retiree benefits, this decline in relative price could tip the balance in favor of retiring and purchasing the now cheaper insurance in the individual market. Similar trade-offs also exist for workers without *any* employer sponsored health benefits. For example, prior to the ACA, an older person may prefer to work at a job that does not offer any health benefits but compensates with a high wage, or the person may be unable to move to a job with insurance due to low job mobility. For this person

the marginal product of labor outweighs the value of leisure and of insurance in the individual market. After 2010, this person must purchase insurance (or pay a penalty) and also faces lower prices in the individual market. For the marginal person, the marginal product of labor less the penalty of not having insurance may be outweighed by the value of leisure and of the now more affordable insurance from the individual market.⁶ Thus, the ACA may increase the likelihood of retirement among workers without any employer sponsored health benefits.

Given forward looking behavior, these tradeoffs imply that current workers without retiree benefits should respond to the incentives in the ACA by planning to retire earlier than they would have in the absence of the ACA while workers with retiree benefits should not change their retirement plans.

4. Data

I use data from the 1998 through 2014 waves of the Health and Retirement Study (HRS) to assess the impact of the ACA on the retirement plans of older workers. The HRS is a biennial, panel survey of a nationally representative sample of older adults and their spouses. The analysis sample is restricted to individuals who are 45 to 60 years old and are working full time in 2008. Although some part time workers have retiree benefits, these individuals are likely to be very different from full time workers and excluding them generates more comparable groups for the difference-in-differences analysis described below. Restricting the sample to full time workers also excludes individuals who may have a weaker attachment to the labor force and therefore, may have been differentially affected by the Great Recession. The sample includes individuals belonging to the HRS (born 1931-1941), War Babies (born 1942-1947) and Early Baby Boomer (born 1948-1953) cohorts of the survey. Observations with missing or inconsistent values of key analysis variables are excluded. These restrictions yield a final sample size of 1,180 individuals and 5,631 person-year observations.

The key dependent variable (P^{62}) measures an individual's subjective probability of retirement at age 62 and is based on responses to the following question:

⁶ Note that, in addition to wages, the marginal product of labor also incorporates higher annual Social Security benefits from retiring at a later age.

"Thinking about work in general and not just your present job, what do you think the chances are that you will be working full-time after you reach age 62?"

This question is only asked to persons who are younger than 62 years of age and are working. Responses range from 0 to 100 and the mean probability is 56.6% (Table 1). Benitez-Silva and Dwyer (2005) examine the rationality of retirement expectations in the HRS finding that subjective retirement expectations are consistent with the rational expectations hypothesis and individuals correctly update their expectations in response to new information. The subjective retirement probability in the HRS has been used to study the impact of pension wealth on retirement decisions (Chan & Stevens 2004) and the impact of retirement on consumption (Haider & Stephens 2007).⁷

The key independent variable (*NoRetireeCoverage*) measures the lack of employer sponsored retiree coverage or any employer sponsored health benefits in 2008, i.e. the HRS wave just prior to the enactment of the ACA. This variable is obtained from the RAND HRS data file (Version O) and captures coverage from own or spouse's employer.⁸ Individuals who have health insurance through their own employer or their spouse's employer are asked if the plan would cover them up to age 65 if they left the job before age 65 (if from current employer) or if the plan could be continued to age 65 (if from previous employer). The variable is set to one for persons who do not have employer sponsored retiree health insurance. Note that this variable captures the *offer* of retiree insurance rather than take-up. Using coverage prior to the ACA allows me to avoid concerns about reverse causality since the ACA may also influence employers' offers of retiree coverage.

Table 1 presents summary statistics for the main analysis sample and separately for persons with and without retiree coverage in 2008. Not surprisingly, persons with retiree coverage are more likely to be male, have higher educational attainment and longer job tenure compared to persons without retiree benefits.

⁷ In general, a large literature finds that subjective probabilities are strongly correlated with the actual realization of the event in question, and that individuals update their expectations in response to new information. For example, prior studies have evaluated mortality expectations (Smith *et al.* 2001; Hurd & McGarry 2002), job loss expectations (Stephens 2004), Social Security income expectations (Dominitz *et al.* 2002), and inheritance expectations (Brown *et al.* 2010).

⁸ The RAND HRS file is a user-friendly version of HRS containing cleaned versions of some of the most commonly used HRS variables. It was created by the RAND Center for the Study of Aging with funding from the National Institute on Aging (NIA) and Social Security Administration (SSA). See Chien *et al.* (2015) for details.

5. Econometric Methodology

To identify the causal impact of the ACA on retirement expectations, I employ a differencein-differences strategy that compares the pre vs post ACA changes in retirement expectations for persons with and without employer sponsored retiree coverage in 2008. Specifically, I estimate the following regression model:

$$P_{it}^{62} = \beta_0 + \beta_1 NoRetireeCoverage_{i2008} \times PostACA_t + \beta_2 NoRetireeCoverage_{i2008} + \beta_3 PostACA_t + \beta_4 X_{it} + \varepsilon_{it}$$

The dependent variable is the self-reported likelihood of working past age 62 for person *i* in year t. The "treatment group" indicator, $NoRetireeCoverage_{i2008}$, is one if person i either does not have any employer sponsored health insurance in 2008 or has employer sponsored insurance that will not be available during retirement.⁹ The indicator is zero if person i has employer sponsored retiree coverage in 2008. The regression in equation (1) compares trends in retirement expectations for persons without employer sponsored retiree benefits, who should be affected by the ACA, to persons with retiree benefits, who should not be affected by the ACA to the same extent. As mentioned above, defining the treatment and control groups based on coverage in 2008 allows me to avoid concerns related to reverse causality. Since the ACA may also influence an employer's propensity to offer retiree benefits, the act could potentially influence the composition of the treatment and control groups if current coverage were to be used to define these groups. Instead, I identify persons with and without employer sponsored retiree benefits prior to the ACA and follow them over time to assess the extent to which the ACA influenced their retirement plans. PostACA is an indicator for observations in 2010 or later and X includes a basic set of demographic and job characteristics to account for individual and job-specific differences in access to retiree coverage. Specifically, demographic variables include age fixed effects, indicators for male, non-Hispanic Black, other non-Hispanic White and Hispanic (non-Hispanic White is the reference category), indicators for a high school degree and some college or higher educational attainment (less than high school degree is the reference category) and

[1]

⁹ Note that the treatment group includes persons who may have insurance from other sources.

census division of residence fixed effects. Job characteristics include occupation fixed effects, industry fixed effects and indicators for tenure on the current job of 5-10 years, 10-15 years, 15-20 years, 25-30 years, 30-35 years and 35 or more years (less than 5 years forms the reference category). All covariates are measured in 2008. The key parameter of interest is the coefficient on the interaction term, β_1 , which captures the pre vs post ACA change in retirement expectations among persons without retiree benefits in 2008 relative to persons with retiree coverage.

Identification of causal effects rests on the standard "parallel trends" assumption that there are no other unobserved factors or events that contribute to differential trends between the two groups before and after 2010. To assess the plausibility of this assumption, I estimate the following event study regression:

$$P_{it}^{62} = \gamma_0 + \sum_{\substack{t=1998, \\ t\neq 2008}}^{2014} \gamma_{1t} NoRetireeCoverage_{i2008} \times Year_t + \gamma_2 NoRetireeCoverage_{i2008} + \sum_{\substack{t=1998, \\ t\neq 2008}}^{2014} \gamma_{3t} Year_t + \gamma_4 X_{it} + \varepsilon_{it}$$

$$[2]$$

Where, *Year* denotes a set of year fixed effects. This regression allows me to evaluate whether the comparison groups exhibited similar trends in retirement expectations prior to the ACA and whether any divergence in trends occurred immediately after the ACA or in later years. In addition, as discussed in detail below, I perform a series of robustness checks and placebo tests to assess the identification strategy and robustness of the results.

The regressions in equations (1) and (2) estimate the effect of the ACA on mean retirement expectations. However, it is plausible that the ACA had heterogeneous effects at different parts of the distribution of retirement expectations. For example, increased access to health insurance due to the ACA may have a small impact on persons who are very sure about their retirement plans (i.e. tails of the distribution) but may have a larger effect on persons that are unsure (i.e. middle of the distribution). Alternatively, the complex set of changes introduced by the ACA may create more uncertainty for individuals who were very sure about their retirement plans prior to the ACA, causing them to revise their expectations away from the tails of the

distribution. To assess such heterogeneous effects, I estimate an unconditional quantile regression model at the 15th, 25th, 50th, 75th and 85th quantiles (Firpo *et al.* 2009).¹⁰

In addition to the impact on the subjective probability at a given age, understanding the impact of the ACA on the *age* at which individuals expect to retire is of interest. To identify each individual's expected retirement age, I need information on their full age-specific subjective probability distribution.¹¹ The HRS provides two data points - the subjective probability of working past age 62 (P^{62}) and age 65 (P^{65}) . To infer the shape of the full underlying distribution, I need to make additional assumptions. I assume that the maximum age by which each individual expects to be retired is age 68. In other words, I set the subjective probability of working past age 68 to zero for each sample person ($P^{68} = 0$). Each individual's expected retirement age is then calculated using a flexible cubic spline interpolation approach, which is based on relatively weak assumptions and approximates the shape of the underlying distribution well. The cubic spline interpolation approach fits a piecewise polynomial function to the intervals defined by ages 62, 65 and 68. Restrictions on the first and second derivatives of the polynomials and boundary conditions at the endpoints yield equations that can be used to estimate the parameters of the function (see Bellemare *et al.* (2012) for details).¹² The expected retirement age (i.e. the first moment) is directly calculated from the fitted subjective probability function. To identify the impact of the ACA on expected retirement age, I estimate equation (1) replacing the dependent variable with the expected retirement age calculated using the cubic spline approach. This analysis is necessarily restricted to the sample without missing or inconsistent data on P^{65} (N=4,958). The assumption that $P^{68} = 0$ for all individuals is clearly a strong assumption since some individuals may have a strictly positive probability of working past age 68. Therefore, I also estimate specifications assuming that the maximum retirement age is age 70 (i.e. $P^{70}=0$) and age 75 (i.e. $P^{75}=0$) to identify a range of expected retirement ages.

 $^{^{10}}$ In contrast to the conditional quantile regression model (Koenker & Bassett 1978), which assesses dispersion in the outcome variable conditional on the mean values of all covariates, the unconditional quantile model is based the recentered influence function and can be used to examine the dispersion of the unconditional distribution of the outcome variable (Firpo *et al.* 2009).

¹¹ The HRS does include a question on the age at which individuals expect or plan to retire. However, this variable is missing for 64% of the analysis sample. Therefore, I do not use it in the analysis.

¹² An alternative approach would be to assume that P^{62} and P^{65} are drawn from a specific parametric distribution function. However, Bellemare *et al.* (2012) show that the cubic spline method performs better in cases where the parametric function is misspecified. The cubic spline approach also adjusts for censoring and rounding of the reported subjective probabilities, which could potentially lead to biased estimates.

5.1 Statistical Inference

Several recent studies have highlighted the importance of appropriately clustering standard errors in a difference-in-differences model (e.g., Bertrand et al. (2004); Cameron and Miller (2015)). The main set of results presented below cluster standard errors at the household level to account for within household correlations in retirement decisions and serial correlation due to the panel nature of the HRS. The preferred specification also includes fixed effects for census division of residence, industry and occupation. Cameron and Miller (2015) note that while fixed effects can control for part of the within-cluster correlations they do not completely control for within-cluster correlations. Therefore, as a robustness check, I calculate standard errors using a series of alternative clustering approaches (Appendix A, Table A1). Specifically, I use multiway clustering (Cameron et al. 2012) at the following levels: household and age, household and birth year, household and year, household and census division, household and industry, and household and occupation. There may still be a concern about over-rejection of the null hypothesis due to a small number of clusters in some cases. To address this concern, I also present results using the wild cluster bootstrap resampling method. This method has been shown to perform better when there are few clusters (Cameron et al. 2008).¹³ For the unconditional quantile regressions, standard errors are calculated using bootstrap methods with clustering at the household level and are based on 500 repetitions.

6. Results

Figure 1 presents unadjusted trends in mean subjective probabilities for persons with and without employer sponsored retiree coverage. Prior to the ACA, the trend line for persons without retiree coverage is always higher than the corresponding line for persons with retiree coverage. In other words, persons without coverage are more likely to work past age 62. While the two graphs are parallel to each other prior to the ACA, there is a clear change in trend for the treatment group beginning in 2010. The average probability of working past age 62 declines sharply and by 2012, individuals without retiree coverage are less likely to work past age 62 compared to persons with coverage. These trends are consistent with the hypothesis that

¹³ This analysis is restricted to the model with no covariates, since including fixed effects and clustering at the same level as the fixed effect leads to singular matrices in many cases.

increased access to affordable insurance due to the ACA reduces job lock among individuals who do not have employer sponsored coverage.

Table 2 presents results from the DD regression in equation (1). There is a significant, negative effect of the ACA on the retirement expectations of persons without retiree coverage relative to persons with coverage. Specifically, individuals who lacked employer sponsored retiree benefits prior to the ACA are 5.6 percentage points less likely to continue working past age 62 compared to persons who had access to employer sponsored retiree benefits even before the policy change. Relative to the pre-ACA mean of 56.6%, this represents a 9.91% decline in the subjective probability of working past age 62. The effect is robust to controlling for demographic, socioeconomic and job characteristics suggesting that, although there are significant differences between the comparison groups, these differences do not drive differential trends in retirement expectations. The DD estimates and Figure 1 together suggest that persons without retiree coverage respond to the ACA by planning to retire early.

Table 3 presents estimates from the event study specification (equation 2). Prior to the ACA, there is no significant difference between the treatment and control groups in their subjective probabilities, which provides support to the identifying assumption. In 2010 there is a small relative decline in the subjective retirement probability for persons without retiree coverage, however, this effect is not statistically significant. In later years (i.e. 2012 and 2014), there are large, statistically significant relative decreases in the subjective probability of working past age 62. These results suggest that individuals did not respond immediately to the law but rather revised their expectations slowly over time. This lagged response likely reflects the fact that there was considerable uncertainty about the law and particularly about the constitutionality of the individual mandate in the first couple of years. The Supreme Court ruling in June 2012, establishing the constitutionality of the individual mandate, likely played a major role in reducing uncertainty and setting expectations about the future of the law.¹⁴ Further, provisions in the ACA were implemented on a staggered basis and information on state Medicaid expansion decisions and final rules related to the establishment of the insurance exchanges became

¹⁴ See <u>http://healthaffairs.org/blog/2012/06/28/the-supreme-court-on-the-individual-mandates-constitutionality-an-overview/</u> for an overview of the Supreme Court's decision on the individual mandate and <u>https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8347.pdf</u> for an overview of the Supreme Court's decision on the Medicaid expansion.

available gradually. Overall, the lack of pre-existing trends and the large effects in 2012 and 2014 suggest that individuals revised their retirement plans in response to the ACA.

6.1 Robustness Checks

To further assess the plausibility of the identifying assumption and robustness of the results, I estimate several alternative specifications (Table 4). First, I estimate weighted regressions using the HRS sample weights from the 2008 wave. This specification gives a zero weight to persons who are not age eligible for the HRS sample but may have been included in the survey because they are the spouse of an HRS respondent. Using a weighted regression ensures that the estimates are representative of the national population and corrects for endogenous sampling. However, as noted by Solon et al. (2015), it is not always clear that weighting is the better approach and any contrast between weighted and unweighted estimates may provide information on model misspecification. I find the DD estimate to be slightly larger in magnitude and less precise when using weighted regression but it is comparable to the estimate using unweighted regression. Second, I estimate the model in equation (1) excluding 2010 data. Since the ACA was signed into law on March 23, 2010, it is not clear whether 2010 should be treated a "pre" year or a "post" year. If many individuals answered the retirement expectations question before March 23, 2010 during the interviews for the 2010 HRS wave then this would introduce a downward bias in the DD estimate. Prior literature on the dependent coverage mandate has dealt with this issue by excluding 2010 data (Antwi et al. 2013). As expected, the estimated impact of the ACA on retirement expectations is larger in magnitude when 2010 data is excluded. Third, I estimate the DD model excluding persons without employer sponsored health insurance. The treatment group in this case consists of individuals who have employer sponsored insurance in 2008 but no retiree benefits. This exclusion provides more comparable groups, since persons without any employer sponsored insurance may be very different from persons with employer sponsored retiree benefits. Results are robust to excluding persons lacking any employer sponsored insurance, suggesting that the main estimates are not driven by unobserved differences between the treatment and control groups. Fourth, I examine robustness to excluding focal point responses. Figure 2 shows that the responses to the subjective expectations question are clustered at 0, 50 and 100 (i.e. focal point responses). About 12.4% of the sample reports a 0% probability, 15.8% reports a 50% probability and about 20.5% reports a 100% probability. Focal

point responses may reflect a respondent's uncertainty or lack of precise knowledge regarding the timing of retirement or rounding, potentially introducing bias (Kleinjans & Van Soest 2014). I find that the DD estimate is robust to excluding focal point responses. Fifth, I restrict the study period to the years 2004 to 2014, which provides a more balanced time series with exactly three pre-ACA (2004, 2006 and 2008) and three post-ACA (2010, 2012 and 2014) waves of the HRS. Overall, I find that the DD estimate is robust to all these checks.

Next, I examine robustness of the results to controlling for additional variables and assess differential impacts of these variables by treatment group status and time (Table 5). Specifically, I first estimate a regression adding the following variables to the preferred specification: birth year fixed effects, union status, firm size fixed effects (25 to 49, 50 to 99, 100 to 199, 200 to 499 and 500 or larger with 0 to 24 forming the reference category), and indicators for the number of pension plans (the maximum number is 4), at least one defined contribution plan and at least one defined benefit plan. Union status, firm size and the availability of pension plans are, in general, correlated with the offer of retiree benefits and also influence retirement timing. The full retirement age (FRA), at which a person becomes eligible for full Social Security benefits, has been increasing for recent birth cohorts and this influences retirement timing (Behaghel & Blau 2012). Recent cohorts may also be less likely to have retiree benefits given the steady decline in offer rates over the past few decades. Birth year fixed effects account for such cohort differences. I find a slightly larger effect of the ACA (6.5 percentage points) when these additional variables are included in the regression. The specification in Column 2 adds interactions between the treatment group indicator and the following variables: union status, firm size fixed effects, an indicator for having at least one pension plan, birth year fixed effects, census division, industry fixed effects and occupation fixed effects. These interactions account for any differential effects of these factors by treatment group status. For example, pension incentives may differentially affect the retirement plans of persons with and without retiree coverage. The final specification in Column 3 of Table 5 adds interactions between the post 2010 dummy and the same set of variables, accounting for any differential impact of these factors over time. For example, retirement trends among union workers may evolve differently from non-union workers after 2010. Overall, the DD estimate is robust to adding these controls suggesting that it is not driven by differential trends in the impact of job characteristics or across birth cohorts.

6.2 Placebo Tests

As discussed above, the main concern related to the identification strategy is that there may be unobserved factors or events that cause differential trends in retirement plans between the comparison groups. In particular, factors that differentially affect job security or financial security during retirement could affect labor supply decisions, leading to biased estimates. A differential response to the 2007-2009 recession by retiree coverage status is one such concern. However, the identified effects are not consistent with a differential response to the recession. In theory, the recession has two countervailing effects on retirement. Declines in wealth due to the housing crisis and the stock market crash should lead to a delay in retirement for older workers, since they would now need to work longer to accumulate sufficient wealth to retire comfortably. On the other hand, high unemployment rates may lead older persons to retire earlier than planned since it is often more difficult for older individuals to re-enter the labor force after a layoff. Since this study examines the retirement expectations of current workers, the first effect is of relevance. Studies evaluating retirement expectations both during the recession and after 2009 generally find that workers expect to *delay* retirement to deal with reduced retirement income (Helman et al. 2011; McFall 2011; Rix 2011). Consistent with the idea that older workers may delay retirement in response to the wealth declines associated with the recession, Figure 1 shows that there is an increase in the subjective probability of working past age 62 in 2008, however, both persons with and without retiree benefits exhibit this increase implying that there are no differential responses to the recession in 2008. The results also rule out a delayed response to the recession. Figure 1 clearly shows that the significant DD estimates are driven by increases in the probability of early retirement for the treatment group in 2012 and 2014 and not by increases in probability of delayed retirement for the control group.

To further assess the potential for biases due to unobserved labor market factors, I estimate the impact of the ACA on two subjective probability variables that may be affected by unobserved labor market factors but should not be affected by the ACA. The first variable is based on the following HRS question:

"Sometimes people are permanently laid off from jobs that they want to keep. On the same scale from 0 to 100 (where 0 means absolutely no chance and 100 means absolutely certain), what are the chances that you will lose your job during the next year?" The second variable is based on the following HRS question:

"Suppose you were to lose your job this month. What do you think are the chances that you could find an equally good job in the same line of work within the next few months?"

These subjective expectations capture individual perceptions about job security and are likely to be influenced by unobserved labor market trends or individual specific factors that also affect labor supply but they should not be affected by increased access to health insurance due to the ACA. Stephens (2004) shows that the first measure, subjective probability of job loss, is a strong predictor of actual realizations of subsequent job displacement.

Another potential source of bias is unobserved changes in the economy or factors that may differentially affect retirement wealth and therefore influence labor supply decisions. For example, individuals with retiree benefits may be more likely to invest in risky assets and may therefore experience differential growth in wealth compared to persons without retiree coverage. To assess the potential for such biases, I examine the impact of the ACA on responses to the following HRS question:

"We are interested in how well you think the economy will do in the future. By next year at this time, what is the percent chance that mutual fund shares invested in blue chip stocks like those in the Dow Jones Industrial Average will be worth more than they are today?"

This variable captures individual perceptions about future economic trends and may also capture individual differences in financial literacy. It is likely to be affected by unobserved factors that influence financial security during retirement but should not be affected by the ACA.

I find no effect of the ACA on any of these subjective expectations (Table 6), supporting the inference that the estimates in Table 2 are not driven by unobserved factors. Since the placebo questions are not asked in every wave, the samples used for the placebo regressions are slightly different from the main analysis sample. For comparison purposes, I also present estimates of the ACA's effect on retirement expectations for the same samples used in the placebo regressions. The results suggest that the lack of effect on placebo variables is not due to the samples used but

rather reflects the fact that unobserved factors do not play a role in the identified labor supply responses.

6.3 Impact on Uncertainty

To assess whether the ACA affected uncertainty regarding retirement timing, I first use quantile plots to graphically examine changes in the distribution of P^{62} . The quantile plot graphs ordered values of P^{62} against the fraction of the data that have values less than that fraction. Figure 3 presents quantile plots for persons with and without retiree coverage for the pre versus post ACA periods. During 1998-2008 (pre-ACA), the quantile plot for persons without retiree coverage lies to the left of the corresponding plot for persons with retiree coverage, i.e. it is more left skewed for persons without retiree coverage. In contrast, the two plots overlap quite a bit during 2010-2014 (post-ACA). For example, pre-ACA, the 75th percentile corresponds to a subjective probability of 95% for persons without retiree coverage versus 90% for persons with retiree coverage loss that the policy shifted more persons without retiree coverage towards lower values of P^{62} . Appendix B presents additional results from difference-in-differences regressions.

To formally assess the impact on uncertainty, I present results from an unconditional quantile regression model estimated at the 15th, 25th, 50th, 75th and 85th quantiles (Table 7).¹⁵ Consistent with the graphical analysis, I find that the ACA shifts the probability distribution of persons lacking retiree coverage away from higher values of the subjective probability of working past age 62 towards lower values, making it less left-skewed. The DD estimate at the 15th quantile is small and insignificant suggesting that the ACA does not have much of an effect on persons who have a low probability of working past age 62. The DD estimate at the 85th quantile is about 2.9 percentage points, much smaller than the average effect identified above. In contrast, the DD estimate at the median is substantially larger (almost 18 percentage points) and statistically significant. These results imply that persons who are very sure that they will retire once past the age of 62 are not at all responsive to the policy change while persons who are very sure that they will continue to work past age 62 exhibit a modest response to the policy change.

¹⁵ Regressions estimated at the 5th and 10th quantiles did not converge. The DD estimate at both the 90th and 95th quantiles is 2.933 (p-value=0.045).

Persons who are in the middle of the subjective probability distribution and are somewhat unsure about working past age 62 are the most responsive to the policy change. This suggests that in addition to increasing the likelihood of early retirement on average, the ACA also reduces uncertainty related to retirement decisions.

To further evaluate potential reductions in uncertainty, I examine responses to a question that was introduced in the 2008 wave of the HRS. Persons who report a 50% probability on the retirement expectations question are asked an additional question: "*Do you think it is about equally likely as it is unlikely or are you just unsure?*" Figure 4 graphs the proportion of individuals who say they are unsure, by retiree coverage status and year, for the sample of persons who report a 50% chance that they will continue working past age 62 (N=340). Among those lacking retiree insurance, the percent of individuals reporting that they are unsure drops from 63% in 2008 to 56% in the post period (2010-2014). In contrast, for persons with retiree coverage, the percent of unsure responses ("equally likely" is the reference category) as the dependent variable in a DD regression, I find that the ACA decreased unsure responses by 22.6 percentage points (p-value=0.058) among persons without retiree coverage relative to persons with retiree coverage (not shown). Overall, the evidence on unsure responses supports the notion that the ACA reduced uncertainty related to retirement decisions, however, one caveat with this analysis is that the sample is small and selective and only one year of pre-ACA data is available.

6.4 Heterogeneous Effects

Next, I examine heterogeneity across various subpopulations to identify which individuals are most likely to respond to the incentives in the ACA. First, I examine heterogeneity by current age (Table 8). Column 1 presents results from the DD regression estimated on the sample of persons that are younger than 55 years at the time of the survey, Column 2 presents results for persons aged 55 to 59 years and Column 3 for persons aged 60 to 62 years. The results show that the largest effect is for the middle group -55 to 59 year olds. Persons who are within one to two years away from turning 62 are not at all responsive to the policy change. Given the complexity of retirement decisions, individuals who are close to age 62 may have set plans that they are not willing to change. On the other hand, persons younger than 55 years may not respond to the ACA because the policy changes are not particularly salient for individuals who still have many

years to retirement. The largest effects seem to be for persons who are close enough to retirement for the policy changes to be salient but far enough that they can easily adjust their retirement plans. Such heterogeneous responses may explain why studies examining actual labor supply changes in the first couple of years after implementation do not find significant effects (Levy *et al.* 2015).

Table 9 examines heterogeneous effects by various demographic, socio-economic and health variables. First, I examine heterogeneity by income measured in 2008. As discussed above, persons with income less than 400% of the Federal Poverty Line (FPL) are eligible for federal premium subsidies to purchase insurance on the exchanges and persons with income less than 250% of FPL are also eligible for cost sharing subsidies. Thus, for lower income individuals the ACA is expected to substantially reduce the price of insurance in the individual market. For higher income persons, on the other hand, even with increased competition and reduced adverse selection in the individual market, exchange premiums may be too high compared to the premiums of employer sponsored coverage. For these individuals, the value of insurance and leisure may not outweigh lower Social Security benefits and the loss of wage income. Consistent with this, I find that there is a large, significant effect (almost 8 percentage points) of the ACA on persons with income less than 400% FPL but no effect on persons with higher income levels. Second, given well-known differences in the labor supply of men compared to women, I examine gender differences in the impact of the ACA. Women are also more likely to have coverage as a dependent¹⁶ and therefore may be less responsive to the ACA related changes. I find a larger response among men compared to women, however the difference is not substantial. Third, I examine differences by marital status. In general, married individuals should be less responsive to the incentives in the ACA since they potentially have access to affordable insurance through their spouse. Consistent with this notion, I find a small, insignificant effect for married persons and a large, significant effect for unmarried persons. Fourth, I examine differences by health status. Persons who are in relatively poor health should respond more to the policy change since these individuals are much more likely to be "locked" into jobs in order to keep access to health insurance. Individuals with pre-existing conditions also faced very high premiums in the individual market prior to the ACA, and likely benefit substantially from ACA provisions such as guaranteed issue and (adjusted) community rating. Consistent with this, I find

¹⁶ Source: <u>http://files.kff.org/attachment/fact-sheet-womens-health-insurance-coverage</u>, accessed 6/7/2016.

an effect for persons with 2 or more chronic conditions that is almost twice as large as that for persons with fewer than 2 chronic conditions.¹⁷ Finally, I examine differences by educational attainment and cognition. Persons with higher educational attainment and better cognition may be better at understanding and processing the complex incentives related to the ACA and early retirement (i.e. allocative efficiency), and therefore may be more responsive to the policy change. To assess this, I compare persons with at least some college education to persons with a high school degree or lower educational attainment. I also compare persons based on two measures of cognition available in the HRS – the word recall score which measures episodic memory and the serial 7 score which measures working memory.¹⁸ Consistent with the principle of allocative efficiency, I find that persons with higher educational attainment and better cognition differences presented in Table 9 are economically meaningful, none are statistically significant, likely due to the low sample sizes.

6.5 Expected Retirement Age

Next, I examine the impact of the ACA on individuals' expected retirement ages. Table 10 presents results from DD regressions where the dependent variable is the subjective expectation of age at retirement calculated using the cubic spline approach. The first column presents results based on the assumption that the maximum age by which each person expects to retire is 68. Results in the second column are based on the assumption that each person expects to retire by age 70 and results in the third column are based on the assumption that each individual expects to retire by age 75. The mean subjective retirement age ranges from 64.3 years, assuming that the subjective probability of working past age 68 is zero, to 65.7 years, assuming that the subjective probability of working past age 75 is zero. The DD estimates show that the ACA caused individuals without retiree benefits to retire approximately 0.3 to 0.6 years (or 3.6 to 7.2 months) earlier than persons with retiree coverage. The lower end of this range is comparable to findings

¹⁷ The list of chronic conditions includes high blood pressure, diabetes, cancer, lung disease, heart problems, stroke, psychological problems and arthritis.

¹⁸ The word recall score is based on a list of 10 nouns read to the respondent who is then asked to recall as many words as possible. After approximately 5 minutes, during which other questions are asked, individuals are asked to repeat the task. The score is the count of correct recalls from both times (range: 0 to 20). The serial 7 score is based on a task in which respondents are asked to subtract 7 from 100 and to continue subtracting 7 from each subsequent number for a total of five times. The score is the count of correct subtractions, with each subtraction assessed independently (range: 0 to 5).

from prior studies on the impact of retiree coverage. For example, assuming that all working 64year-olds retire at age 65, Nyce *et al.* (2013) estimate that, conditional on working at age 57, retiree benefits reduce the expected retirement age by almost 3 months.

7. Conclusion

I find that the 2010 Affordable Care Act significantly influenced the retirement plans of older adults and reduced job lock among persons lacking employer sponsored retiree health benefits. Persons without employer sponsored retiree coverage reduce their subjective expectation of working past age 62 by almost 10% after 2010, relative to persons with employer sponsored retiree coverage. On average, individuals expect to retire about 3.6 to 7.2 months earlier due to the ACA. Individuals who are potentially eligible for federal subsidies, relatively unhealthy individuals and persons with higher education and better cognition are more responsive to the policy change. A key finding of this study is that health reform reduces uncertainty regarding retirement timing. Older individuals must weigh a complex set of factors when making decisions regarding the timing of retirement. Uncertainty about factors such as the price of insurance in the individual market, health and medical expenses translates to considerable uncertainty about retirement timing, with a non-trivial proportion of older workers reporting that they are unsure whether they will retire by age 62. By reducing uncertainty about health related expenses, the ACA also reduces uncertainty about the timing of retirement.

The alleviation of job lock and reduction in uncertainty both suggest that there are significant welfare gains for consumers, over and above any gains from improvements in health care access and reductions in medical expenditure risk due to health reform. At the same time, these effects also have important implications for the financial sustainability of programs such as Social Security. Given an aging U.S. population, a trend towards earlier retirement puts pressure on an already strained Social Security program. While the benefits to consumers must be weighed against the costs to social programs, the relatively modest change in expected retirement age suggests that the overall impact of health reform may be beneficial.

Finally, this research also contributes to the growing literature on subjective expectations. The findings show that individuals do update their expectations in response to new information (in this case, the availability of insurance not tied to employment). This is an important finding given that individual retirement expectations influence a wide range of economic outcomes, including labor supply, consumption and investment behavior.

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	Full	No Retiree	Retiree	P-value
	Sample	Coverage	Coverage	
P ⁶²	56.642	59.406	54.489	< 0.001
	(36.103)	(35.557)	(36.383)	
Age	55.738	55.672	55.791	0.162
	(3.164)	(3.195)	(3.139)	
Male	0.402	0.338	0.451	< 0.001
	(0.490)	(0.473)	(0.498)	
Non-Hispanic Black	0.176	0.177	0.174	0.760
	(0.380)	(0.382)	(0.379)	
Other non-Hispanic races	0.026	0.034	0.020	0.001
	(0.158)	(0.180)	(0.139)	
Hispanic	0.109	0.157	0.071	< 0.001
	(0.311)	(0.364)	(0.258)	
High school graduate	0.264	0.289	0.244	0.001
	(0.441)	(0.454)	(0.430)	
Some college education	0.615	0.534	0.677	< 0.001
	(0.487)	(0.499)	(0.468)	
Current job tenure	13.319	10.161	15.779	< 0.001
	(11.147)	(10.017)	(11.361)	
Observations	5,631	2,466	3,165	

Table 1: Summary Statistics

Table presents means and standard deviations in parenthesis. P-values are for a t-test of equal means between the groups with and without retiree coverage. Age and current job tenure are measured in 2008.

	(1)	(2)	(3)
No Retiree Coverage × Post ACA	-5.854***	-5.534***	-5.610***
	(2.105)	(2.052)	(2.048)
No Retiree Coverage	6.838***	9.696***	6.816***
	(1.770)	(1.773)	(1.861)
Post ACA	2.629*	4.041***	4.191***
	(1.403)	(1.349)	(1.333)
Male		2.393	5.253***
		(1.641)	(1.938)
Non-Hispanic Black		-11.706***	-10.018***
		(2.064)	(2.001)
Other Non-Hispanic Race		-12.091**	-10.580**
		(4.785)	(4.790)
Hispanic		-7.335**	-6.000**
		(2.872)	(2.832)
High School Graduate		11.695***	12.245***
		(2.732)	(2.737)
Some College Education		14.891***	15.123***
		(2.549)	(2.817)
Age Fixed Effects		Х	Х
Census Division Fixed Effects		Х	Х
Job Characteristics			Х
Observations	5,631	5,631	5,631
Households	1,099	1,099	1,099

Table 2: Difference-in-Differences Estimates of the Impact of the ACA on Early Retirement Expectations (P^{62})

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household level. Job characteristics include occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008.

	(1)	(2)	(3)
No Retiree Coverage × Year 1998	4.392	2.205	1.410
	(5.614)	(5.459)	(5.481)
No Retiree Coverage × Year 2000	-1.956	-4.663	-5.248
	(5.569)	(5.469)	(5.471)
No Retiree Coverage × Year 2002	4.081	1.754	2.544
	(4.992)	(4.875)	(4.839)
No Retiree Coverage × Year 2004	1.236	0.881	0.848
	(2.311)	(2.306)	(2.309)
No Retiree Coverage × Year 2006	-2.857	-3.089	-3.207
	(2.160)	(2.150)	(2.153)
No Retiree Coverage × Year 2008	REF	REF	REF
No Retiree Coverage × Year 2010	-2.931	-2.784	-2.776
	(2.394)	(2.374)	(2.380)
No Retiree Coverage × Year 2012	-9.554***	-9.654***	-9.963***
	(3.059)	(2.999)	(2.971)
No Retiree Coverage × Year 2014	-7.500*	-8.934**	-9.162**
	(4.448)	(4.275)	(4.223)
Demographics		Х	Х
Job Characteristics			Х
Observations	5,631	5,631	5,631
Households	1,099	1,099	1,099

Table 3: Event Study Estimates of the Impact of the ACA on Early Retirement Expectations (P^{62})

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include an indicator for no retiree coverage and year fixed effects. Demographics include age fixed effects, dummies for gender, race, ethnicity and education, and census division of residence fixed effects. Job characteristics include occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008. REF stands for reference group.

	(1)	(2)	(3)
	DD Estimate	Mean P^{62}	Observations
	(Std. Error)		(Households)
Weighted Regressions	-6.845***	59.413	4,549
	(2.458)		(958)
Exclude 2010 Data	-9.010***	56.445	4,699
	(2.723)		(1,097)
Exclude Persons without Employer Sponsored Insurance	-5.405**	56.478	4,304
	(2.601)		(834)
Exclude Focal Point Responses	-6.573***	55.087	2,890
	(2.535)		(963)
Restrict to Study Years 2004 to 2014	-5.460***	57.578	5,053
	(1.971)		1,098

Table 4: Robustness to Alternative Samples and Specifications

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include indicators for no retiree coverage and post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division of residence fixed effects, occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008.

	(1)	(2)	(3)
No Retiree Coverage × Post ACA	-6.541***	-6.426***	-7.586***
	(2.220)	(2.184)	(2.526)
Demographics and Job Characteristics	Х	Х	X
Additional Covariates	Х	Х	Х
Interactions with No Retiree Coverage		Х	
Interactions with Post ACA			Х
Mean P ⁶²	56.205	56.205	56.205
Observations	4,636	4,636	4,636
Households	894	894	894

Table 5: Robustness to Additional Control Variables

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include indicators for no retiree coverage and post ACA. Demographic and job characteristics include age fixed effects, dummies for gender, race, ethnicity and education, census division of residence fixed effects, occupation fixed effects, industry fixed effects and job tenure dummies. Additional covariates include birth year fixed effects, union status, firm size fixed effects, indicators for number of pension plans, any defined benefit plan and any defined contribution plan. All covariates are measured in 2008. Interactions are between no retiree coverage or post ACA dummies and each of the following variables: birth year fixed effects, union status, firm size fixed effects, an indicator for having at least one pension plan, census divisions, industry fixed effects and occupation fixed effects.

Table 6: Placebo Tests

	(1)	(2)	(3)
	Lose Job	Find Similar	Mutual Fund
	During Next	Job within	Shares Worth
	Year	Next Few	More by Next
		Months	Year
No Retiree Coverage × Post ACA	-0.027	-2.336	-0.129
	(1.737)	(2.326)	(1.536)
Dependent Variable Mean	16.072	46.670	49.392
Effect On P ⁶²	-7.026***	-7.059***	-6.310***
	(2.488)	(2.486)	(2.099)
Mean <i>P</i> ⁶²	55.601	55.575	58.167
Study Years	1998-2006, 2010-2014	1998-2006, 2010-2014	2004-2014
Observations	3,702	3,709	4,390
Households	1,005	1,003	1,081

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include indicators for no retiree coverage, post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division of residence fixed effects, occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008.

	(1) 15 th	(2) 25 th	(3) 50 th	(4) 75 th	(5) 85 th
No Retiree Coverage × Post ACA	Quantile -0.139	Quantile -3.567	Quantile -17.726**	Quantile -4.463*	Quantile -2.933**
	(2.201)	(4.474)	(6.939)	(2.349)	(1.461)
Percentile	5	20	60	90	100
Observations	5,631	5,631	5,631	5,631	5,631
Households	1,099	1,099	1,099	1,099	1,099

Table 7: Unconditional Quantile Regressions

* p<0.10, ** p<0.05, *** p<0.01. Standard errors in parentheses are based on 500 bootstrap replications clustered at the household level. All regressions include indicators for no retiree coverage and post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division of residence fixed effects, occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008. Unconditional quantile regression models were implemented using the Stata program rifreg.ado by Nicole Fortin.

	(1)	(2)	(3)
	Age < 55 years	Age 55 to 59 years	Age 60 to 62 years
No Retiree Coverage \times Post ACA	-4.228	-7.460**	2.063
	(5.844)	(3.249)	(5.347)
Mean P ⁶²	52.475	57.643	62.448
Observations	2,052	2,545	1,034
Households	831	1,042	832

Table 8: Heterogeneous Effects by Current Age

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include indicators for no retiree coverage and post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division of residence fixed effects, occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008.

	(1)	(2)	(3)	(4)
	DD Estimate	Mean	Observations	Difference
	(Std. Error)	P^{62}	(Households)	(P-Value)
Income $\leq 400\%$ FPL	-7.839**	56.662	2,184	5.098
	(3.202)		(451)	(0.213)
Income > 400% FPL	-2.741	56.629	3,447	
	(2.657)		(653)	
Male	-7.772***	58.194	2,261	1.817
	(2.983)		(515)	(0.649)
Female	-5.955**	55.600	3,370	
	(2.733)		(661)	
Married	-3.209	54.696	3,225	5.289
	(2.810)		(603)	(0.203)
Not Married	-8.498***	59.205	2,399	
	(3.134)		(499)	
Number of Chronic Conditions <2	-5.027**	58.308	3,611	5.020
	(2.473)		(712)	(0.233)
Number of Chronic Conditions ≥ 2	-10.047***	53.663	2,020	
	(3.453)		(423)	
High School Graduate or Lower	-1.673	52.476	2,170	6.130
	(3.216)		(458)	(0.132)
Some College or Higher	-7.803***	59.254	3,461	
	(2.620)		(668)	
Word Recall Score < 11	-3.150	53.393	2,124	4.125
	(3.431)		(458)	(0.322)

Table 9: Heterogeneous Effects by Demographics, Socio-economic Characteristics and Health

Word Recall Score ≥ 11	-7.275***	58.707	3,462	
	(2.464)		(661)	
Serial 7 Score < 3	-0.964	50.575	909	5.955
	(5.166)		(200)	(0.270)
Serial 7 Score \geq 3	-6.919***	57.874	4,677	
	(2.254)		(899)	

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include indicators for no retiree coverage and post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division fixed effects, occupation fixed effects, industry fixed effects, and job tenure dummies. Regressions by gender and education do not include the respective dummies. All covariates are measured in 2008.

	(1) $P^{68} = 0$	(2) $P^{70} = 0$	(3) $P^{75} = 0$
No Retiree Coverage × Post ACA	-0.299***	-0.381***	-0.580***
	(0.092)	(0.117)	(0.179)
Mean Subjective Retirement Age	64.273	64.708	65.715
Observations	4,958	4,958	4,958
Households	1,085	1,085	1,085

Table 10: Effect of the ACA on Expected Retirement Age

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parenthesis are clustered at the household level. All regressions include indicators for no retiree coverage and post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division fixed effects, occupation fixed effects, industry fixed effects, and job tenure dummies. All covariates are measured in 2008. The expected retirement age was calculated using the Stata program splinesBBK.ado by Luc Bissonnette.

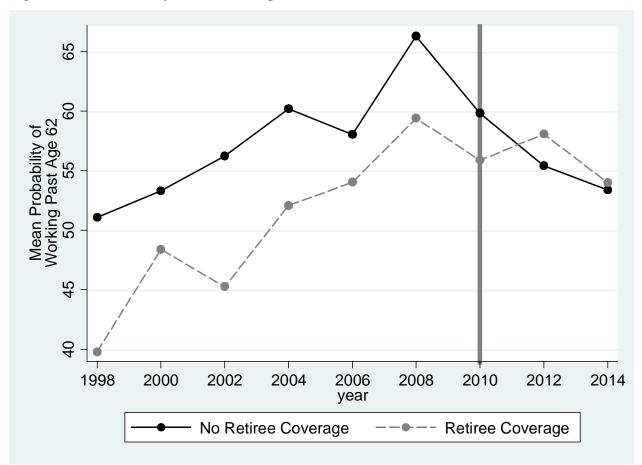


Figure 1: Trends in Early Retirement Expectations

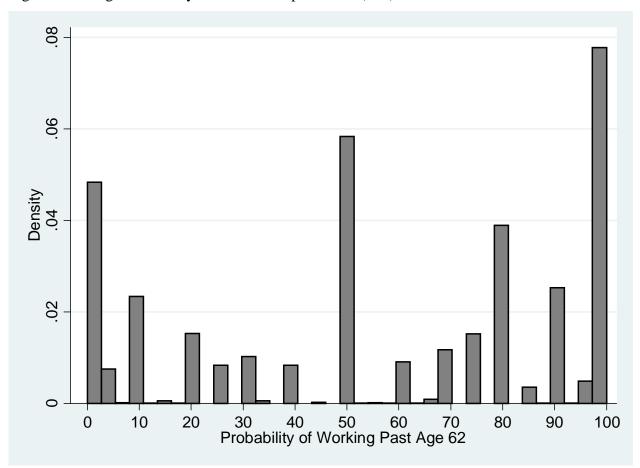


Figure 2: Histogram of Early Retirement Expectations (P^{62})

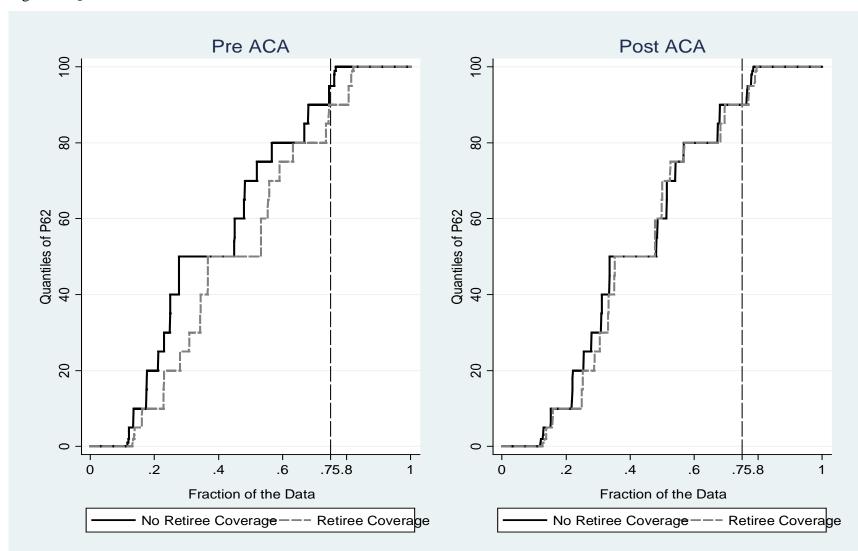


Figure 3: Quantile Plots of P^{62}

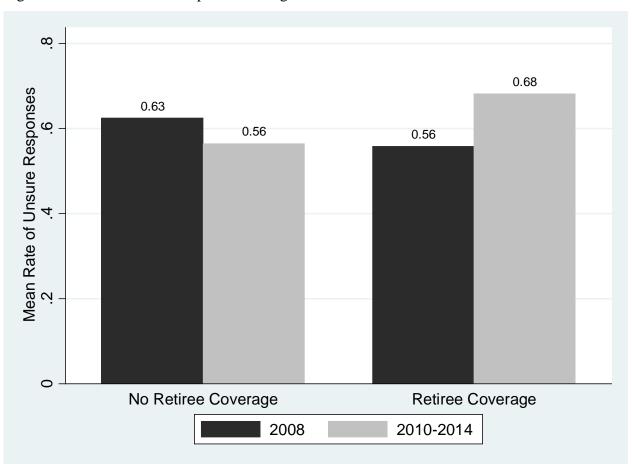


Figure 4: Rates of Unsure Responses among Individuals with $P^{62} = 50\%$

Appendix A: Statistical Inference

Table A1 presents p-values for the DD estimate using alternative approaches to calculate standard errors. The main results cluster at the household level which is presented below for reference purposes. Since individual retirement plans and access to retiree coverage likely vary by age, birth cohorts, time, geography, industry and occupation, I use multiway clustering to account for such correlations. The wild cluster bootstrap approach accounts for over-rejection of the null hypothesis when there are a small number of clusters (Cameron & Miller 2015). The standard errors are indeed larger when using the wild cluster bootstrap method, however, in all cases, there is still a significant effect of the ACA on the subjective probability of working past age 62.

	(1)	(2)
	Number of Clusters	P-Values
One-way Clustering		
Household Level	1,107 Households	0.006
Multiway Clustering		
Household and Age	1,107 Households and 28 Ages	0.003
Household and Birth Year	1,107 Households and 17 Birth Years	0.001
Household and Year	1,107 Households and 9 Years	0.009
Household and Census Divisions	1,107 Households and 9 Census	0.006
	Divisions	
Household and Industry	1,107 Households and 19 Industries	< 0.001
Household and Occupation	1,107 Households and 25 Occupations	< 0.001
Wild Cluster Bootstrap		
Household and Age	1,107 Households and 28 Ages	0.022
Household and Birth Year	1,107 Households and 17 Birth Years	0.044
Household and Year	1,107 Households and 9 Years	0.016

Table A1: Alternative A	Approaches to	Calculating S	Standard Errors

Household and Census Division	1,107 Households and 9 Census	0.044
	Divisions	
Household and Industry	1,107 Households and 19 Industries	0.018
Household and Occupation	1,107 Households and 25 Occupations	0.006

Regressions include indicators for no retiree coverage and post 2010 and their interaction but no other covariates. The DD estimate is -5.85. Multiway clustering was implemented using the Stata program cgmreg.ado by Doug Miller and the wild cluster bootstrap was implemented using the Stata program cgmwildboot.ado by Judson Caskey.

Appendix B: Effect of the ACA at Different Points of the P^{62} Distribution

Table B1 presents evidence on the impact of the ACA at different points of the subjective retirement probability distribution. I find no effect on the likelihood of reporting a 0% probability of working past age 62, however, there is significant reduction in the likelihood of reporting a subjective probability greater than 25% (significant at the 10% level), greater than 50%, greater than 75% and equal to 100%. The results suggest that the distribution of P^{62} became less left-skewed due to the ACA with fewer individuals reporting high subjective probabilities of working past age 62.

Dependent Variable	DD Estimate	Mean Dependent
	(Std. Error)	Variable
$P^{62} = 0$	0.003	0.124
	(0.019)	
$P^{62} > 25\%$	-0.049*	0.719
	(0.026)	
$P^{62} > 50\%$	-0.085***	0.509
	(0.028)	
$P^{62} > 75\%$	-0.063**	0.408
	(0.028)	
$P^{62} = 100\%$	-0.048**	0.205
	(0.023)	
Observations	5,631	
Households	1,099	

Table B1: DD Estimates of the ACA's Effect at Different Points of the P^{62} Distribution

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses are clustered at the household level. All regressions include indicators for no retiree coverage and post ACA, age fixed effects, dummies for gender, race, ethnicity and education, census division of residence fixed effects, occupation fixed effects, industry fixed effects and job tenure dummies. All covariates are measured in 2008.