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Age-speci c Retirement E ects of The ACA Exchanges

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Abstract

In the U.S., as workers near traditional retirement age, health insurance becomes a major consideration in retirement decisions, especially for those who are too young to qualify for Medicare. In this paper, I examine the extent to which the opening of the A ordable Care Act (ACA) exchanges a ected the retirement expectations and decisions of older workers. I estimate a di erence-in-di erences model that exploits variation in workers' access to employer-based retiree health insurance (RHI) prior to the passage of the A ordable Care Act. Retirement expectations and behavior are compared before and after the 2014 opening of the ACA health insurance exchanges. I nd signi cant e ects on both expectations and behavior for those nearing the minimum Social Security Eligibility age of 62, but not for earlier or later ages. The expected probability of working full-time at age 62 declines 5.4 percentages points for those without RHI relative to those with RHI. Treated individuals were 49 percentage points more likely to be retired by age 61 or 62 following the opening of the exchanges, relative to those in the comparison group.

JEL: H51, I13, J26

1 Introduction

In the U.S., as workers near traditional retirement age, health insurance becomes a major consideration in retirement decisions, especially for those who are too young to qualify for Medicare. Prior to 2014, there were few private health insurance options, and they tended to be far more expensive than employer-sponsored insurance.[1] As a result, older workers may have been induced to stay with their employers longer than they otherwise would have, simply to continue receiving a ordable health insurance, a phenomenon that is known as "retirement lock". Given the current debate surrounding Medicare-for-All and other single-payer healthcare systems, it is important to gain a better understanding of how health insurance policies impact labor force participation of older workers.

In this paper, I examine the e ect of non-group health insurance availability on the retirement expectations and behavior of older workers using the opening of the ACA health insurance exchanges as a source of variation in the availability of retiree health insurance. The 2010 Patient Protection and A ordable Care Act (ACA) required that states open health insurance exchanges, where non-group plans could be purchased, with subsidies given to low-income individuals. These exchanges, which were required to be open by January 1, 2014, drastically reduced the cost of purchasing individual (non-group) health insurance (Heim et al., 2015). As a result, some workers may have retired earlier than they would have in the absence of the ACA exchanges.

I use the di erence-in-di erences strategy of Ayyagari (2019) to compare workers with and without access to employer-provided retiree health insurance (RHI) prior to the opening of the ACA exchanges. I use data from the Health and Retirement Study to exploit variation in workers' options to purchase retiree health insurance through their (or their spouse's) employer as a source of variation in the e ect of the ACA exchanges on retirement decisions retire prior to age 65, they can retain their current health insurance coverage, so a change in the availability of affordable non-group health insurance is likely to have a much smaller effect on their retirement decisions. Those without RHI, not having the option of continuing their current coverage through their employer once they retire, are more likely to respond by retiring earlier than they would have in the absence of the ACA exchanges. Ayyagari (2019) uses this approach to analyze changes in retirement expectations after the 2010 passage of the ACA. In contrast, I analyze changes in both expectations and retirement behavior after the exchanges actually open in 2014.

Also closely related to my paper is Gustman, Steinmeier, and Tabatabai (2019), who also analyze retirement around the 2010 passage of the ACA using a similar difference-in-differences strategy. Unlike Ayyagari (2019), the authors take into account whether the worker previously had access to employer-sponsored health insurance (ESHI). The authors divide workers into three groups; those with ESHI and RHI, those with ESHI but not RHI, I find that workers aged 53-61 without RHI were 5.4 percentage points less likely to expect to be working full-time at age 62 following the 2014 change, compared to those with RHI, when including state-year fixed effects in my model. This is consistent with Ayyagari (2019), who finds that the subjective probability of working decreased following the passage of the ACA. When I include state-year-2010 wage fixed effects and restrict the sample to those who had ESHI in 2010, this effect is relatively unchanged. The effect on expected probability of working full-time at age 62 is largest for workers aged 59 to 61.

Additionally, by estimating e ect of the ACA exchanges at various retirement ages, I identify the age group that is likely to respond most strongly to healthcare policies that encourage earlier retirement. Prior to the passage of the ACA and the opening of the exchanges, age 65 was a binding oor on retirement for many workers who were concerned to the ACA exchanges was not subject to any income-based eligibility criteria.

The subject of retirement lock has also been considered in other contexts. Gruber and Madrian (1995) use variation in state continuation of coverage policies, and find that these policies do induce retirement. Nyce et al. (2013) use variation in employer RHI offerings and find that firms who offer RHI see significantly more turnover of older employees. Wettstein (2020), using a similar methodology to Ayyagari, considers the effect of Medicare Part D prescription drug coverage on retirement. The author finds that the additional coverage led the literature regarding health insurance and employment by considering the effects of a policy change that directly affects health insurance availability for a large fraction of the older population.

2 Background on the Affordable Care Act

The Patient Protection and Affordable Care Act was signed into law on March 23, 2010. Among other provisions, the ACA legislated that states must establish health insurance exchanges (or adopt a new federal marketplace) where individuals could purchase health insurance from private insurance companies. These exchanges opened on January 1, 2014.

workers are observed to remain with their jobs to retain their health insurance plans. While employer-sponsored insurance is still the most common source of private insurance, following the ACA, workers were able to purchase non-group health insurance through their state's marketplace. For families with a modified adjusted gross income up to 400% of the federal poverty line, these plans were subsidized. Using tax data, Heim et al. (2015) find that, after taxes and subsidies, health insurance premiums were 42.3% lower for self-employed workers after the passage of the ACA. This drastic change in the price of non-group health insurance, along with changes in the availability of such insurance to older workers, informs my difference-in-differences strategy.

3 Data

The data for this paper come from the 2010 to 2016 waves of the Health and Retirement Study (HRS). The HRS is a nationally representative biennial panel survey of older individuals.[4] Currently on its 7th cohort, this comprehensive study follows individuals, as well as their spouses, from the time they enter the survey (when the individual is between ages 51 and 61), through the end of their lives. [5]

Individuals are asked whether they have the option of enrolling in retiree health insurance through either their current or former employer, or that of their spouse. Each wave also includes the following question:

"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?"

Respondents are asked to give a value between 0 and 100, where 0 means that there is "absolutely no chance" that the respondent will be working after age 62, and 100 means that

[4] This survey is conducted by the University of Michigan's Institute for Social Research.

[5] I use a version of the HRS data that has been cleaned and harmonized by the RAND Corporation for most variables. The retirement expectation variable and state of residence are taken from the raw HRS data files.

it is \absolutely certain" that the respondent will be working after age 62. For this paper, I reverse the outcome, such that a value of 100 implies that the individual is certain they will not be working at age 62. This is done for easier comparison with the observed retirement variables.

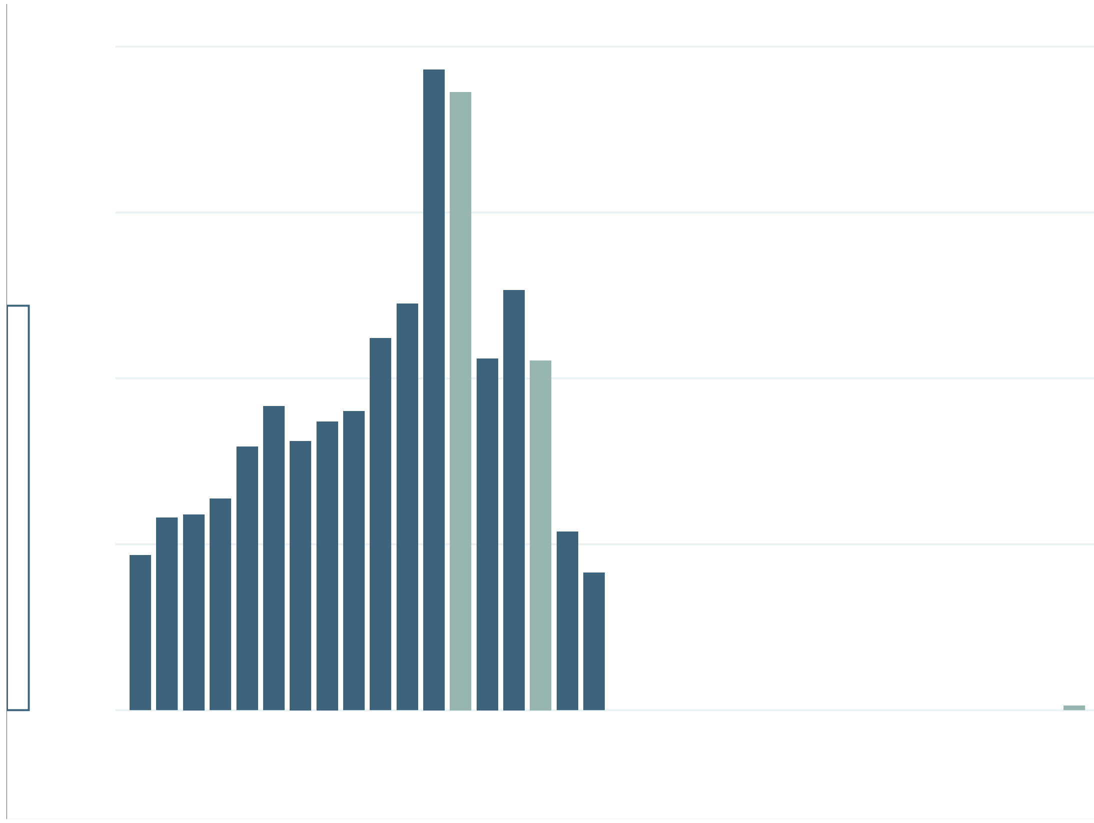
In order to measure the effect of the exchanges on an individual's actual retirement decisions, I use two different retirement outcomes that are based on respondents' answers to questions regarding retirement status and reasons for not working (with retirement being an option). Respondents who report being retired and are not working are coded as fully retired. Those who report being retired and are working part-time are coded as partly retired. Those who are working full-time are coded as not retired, regardless of how they answer the retirement status question. The first outcome I use is whether or not the individual's labor force status is reported as either partly or fully retired. The second outcome is whether an individual is considered fully retired.

4 Methodology

In this paper, effects are allowed to vary by age. Results are estimated separately for each two-year age bin, as described in sections 4.1 and 4.2 below. This is motivated by the fact that retirement ages are not evenly distributed over some interval. Rather, individuals tend to retire at specific retirement ages, usually associated with some statutory minimum.

Figure 1 shows the distribution of retirement ages for individuals in the HRS who retired after age 54, and who retired prior to 2010. It is clear from this figure that there is a disproportionate increase in retirement at ages 61 and 62. Most workers in the U.S. are eligible to begin claiming Social Security benefits as soon as they turn 62. In fact, 31% of Americans begin claiming Social Security in their first month of eligibility (Fitzpatrick and Moore, 2018). Therefore, I run the analysis separately for 2-year age bins for two reasons. The first is that because a large fraction of workers retire right around age 62, we might expect to find the largest effects for this age group. The second reason is that there may

Figure 1: Distribution of Retirement Ages



Note: Sample is restricted to workers in the Health and Retirement Study who retired at age 54 or later, and who retired prior to 2010.

be some heterogeneity among retirees based on age at retirement. For example, those who choose to retire at age 62 may be more financially constrained than those who retire earlier, so affordable insurance may be a much bigger factor in the retirement decision. By dividing the sample into age bins, I can better account for that heterogeneity.

4.1 Retirement Expectations

My analysis sample for retirement expectations is restricted to individuals between ages 53 and 61 who were working full-time in 2010 and were covered by employer-sponsored health insurance in 2010. As mentioned in section 1, those without ESHI were not retirement-locked prior to ACA, so the policy change presumably did not affect their incentives to retire. The treatment group consists of individuals who report in 2010 that they do not have access to retiree health insurance (RHI) until or beyond age 65, through either their current or previous employer, or that of their spouse. The control group consists of all individuals without such access to RHI in 2010. The analysis sample, excluding those who are missing values of any key variables, contains 3,773 observations.

Table 1 displays summary statistics for key variables, with the sample restricted to years 2010 and 2012, for those who were working in 2010 and had ESHI. Columns 1 and 2 display means and standard deviations for the comparison and treatment groups, respectively. Column 3 contains differences in means. Those in the treatment group have a significantly higher subjective probability of working at age 62. This is unsurprising, as theory would suggest that, prior to the passage of the ACA, those in the treatment group (those without RHI) would be more likely to continue working until age 65 in order to keep their health insurance benefits.

Table 1 shows a statistically significant difference in both educational attainment and wages. Those with access to employer-provided retiree health insurance tend to have higher levels of education, as well as higher wages. This is a concern if individuals with different levels of education or wages experienced different local labor market conditions around the time of the policy change. This seems especially plausible given that the ACA was passed near the peak of the Great Recession.

Because of these differences in the treatment and comparison groups, all of the results will be reported with and without state-year-education and state-year-2010 wage fixed effects. Educational attainment is divided into 4 categories; less than high school degree, high school graduate, some college, and college graduate. For wages, individuals in the sample are divided into quintiles based on weekly wages in 2010.

Additionally, table 1 shows that individuals with RHI are also more likely to have any pension plan, and a defined benefit pension plan. Because these pension plans often provide strong incentives for individuals to retire at certain ages, there are concerns that the effects of pension plan characteristics might be conflated with the effects of retiree health insurance

Table 1: Summary Statistics

Variable	RHI	No RHI	Di erence
Subj. Prob. of Working at 62	54.74	60.88	6.141***
	(0.94)	(1.20)	(1.54)
Whether retired (partly or fully)	0.03	0.02	-0.010*
	(0.00)	(0.00)	(0.006)
Whether fully retired	0.02	0.01	-0.002
	(0.00)	(0.00)	(0.005)
Age	56.84	56.53	-0.315***
	(0.07)	(0.09)	(0.123)
Less than High School Graduate	0.06	0.09	0.027***
	(0.01)	(0.01)	(0.011)
High School Graduate	0.28	0.29	0.007
	(0.01)	(0.02)	(0.020)
Some College	0.32	0.32	-0.003
	(0.01)	(0.02)	(0.020)
College Graduate	0.34	0.31	-0.031
	(0.01)	(0.02)	(0.012)
Black	0.28	0.27	-0.002
	(0.01)	(0.02)	(0.020)
Hispanic	0.11	0.15	0.040***
	(0.01)	(0.01)	(0.014)
Married	0.63	0.21	-0.415***
	(0.01)	(0.01)	(0.020)
Weekly Wage	1171.2	945.93	-225.26***
	(27.24)	(26.86)	(41.435)
Has De ned Bene t Pension Plan	0.41	0.33	-0.083***
	(0.01)	(0.02)	(0.021)
Has Any Pension Plan	0.83	0.75	-0.082***
	(0.01)	(0.02)	(0.017)
N	1,446	821	2,267

* p< 0.1 ** p< 0.05 *** p<

(Gustman, Steinmeier, and Tabatabai, 2019). In order to avoid these issues, all specifications include separate interactions of the post-2014 indicator with indicators for whether the individual had a defined benefit pension plan in the base period, and whether the individual had any pension plan in the base period.

The baseline subjective expectations regression is:

$$
\begin{aligned}
Pr(NotWorking62)_{iast} = \; & \beta_0 + \beta_1 NoRHI_{i;2010} \times PostACA_t + \beta_2 NoRHI_{i;2010} \\
& + \beta_3 X_{i;2010} + \beta_4 W_i + \gamma_a + \delta_{st} + \varepsilon_{iast}; \quad (1)
\end{aligned}
$$

for individual i living in state s at age a in survey wave t. The outcn.t

4.2 Retirement Behavior

The DiD model for retirement behavior compares retirement by a given age across cohorts a ected by the ACA compared to those who are not. Retirement is measured at 2-year age intervals (retirement by age 55-56, 57-58, 59-60, 61-62, 63-64, 65-66). Therefore, the comparison is between individuals reaching that age interval in 2010-2012, and those reaching the age interval in 2014-2016. For analysis of retirement by each 2-year age interval, the treatment group is de ned as individuals who did not have RHI six years prior.

The baseline speci cation is:

$$y(a)_i = \ _0 + \ _1 NoRHI_i \quad TurnAge(a)Post2014_i + \ _2 NoRHI_{iS} + \ _3 X_{i;a \ 6} + \ _4 W_i + \ _{s \ cohort} + \ _i ; \quad (2)$$

where i

coefficient should be positive, indicating that individuals without RHI (the treatment group) who turned age a in 2014 or after saw an increase in the likelihood of being retired, relative to those without RHI.

5 Results

5.1 Retirement Expectations

Figure 2: Test of Differential Pre-trends - Expectation

Note: Figure contains point estimates and 95% confidence intervals for dynamic DiD model. Specification includes full set of controls as well as state-year-2010 wage fixed effects.

An important assumption in a difference-in-differences model is that of equal pre-trends. For retirement expectations, Figure 2 shows a dynamic DiD model in which the RHI variable is interacted with year dummies, with 2010 as the base year. Results are shown separately for the full sample (ages 53 to 61), and for each age bin. These estimates also include the full set of controls noted in section 4.1, with state-year-2010 wage fixed effects. The null effects prior to 2014 in all of the charts are evidence of equal pre-trends.

Table 2: Effect of the ACA on Retirement Expectations

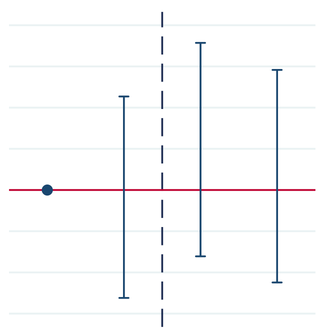
	Subjective Probability of Not Working at Age 62		
	(1)	(2)	(3)
Panel A: Working Full-Time in 2010			
No RHI x Post 2014	5.350***	5.159**	5.300**
	(2.017)	(2.137)	(2.161)
No RHI	-3.553**	-2.818	-3.027*
	(1.701)	(1.757)	(1.789)
Mean of DV	43.127	43.127	43.127
N	5293	5293	5293
Panel B: Working Full-Time & Has ESHI in 2010			
No RHI x Post 2014	4.977**	5.351**	5.359**
	(2.234)	(2.39)	(2.465)
No RHI	-2.796	-2.324	-2.405
	(1.933)	(2.037)	(2.104)
Mean of DV	42.893	42.893	42.893
N	3773	3773	3773
State-Year FEs	X		
State-Year-Education FEs		X	
State-Year-2010 Wage FEs			X

* p< 0.1 ** p< 0.05 *** p< 0.01. Standard errors are clustered at the household level. All specifications include controls for education level, race, gender, marriage status, and spousal employment, as well as indicators for industry, occupation, job tenure, pension enrollment at current job, and pension enrollment interacted with the post-2014 variable.

Table 2 reports estimates from equation 1. In order to compare my results to those of Ayyagari, I first estimate these results using the sample of individuals who were working in 2010. I then compare these results to the coefficient estimates for the sub-sample who had employer-sponsored health insurance. Panel A reports results for the sample of individuals

additional xed e ects. For this group, it may be the case that those who were planning to work until reaching the Medicare eligibility age of 65 were induced to retire earlier as a result of the policy change. As seen in gure 1, a large fraction of workers retire at ages 61

Figure 4: Test of Di erential Pre-trends - Fully Retired



Note: Figure contains point estimates and 95% con dence intervals for dynamic DiD model. Speci cation includes full set of controls as well as state-cohort-2010 wage xed e ects.

in which the individual turns age a. All controls, as well as state-year-2010 wage fixed effects are included in the model. These figures support the assumption of equal pre-trends, as the estimates for periods prior to 2014 are not statistically significant. The graphs in Figures 3 and 4 also indicate that the largest effect of the ACA exchanges is likely to be on retirement by ages 61 to 62.

Table 4: Effect of the ACA on Retirement Behavior

	Partly or Fully Retired					
	(1) Ages 55-56	(2) Ages 57-58	(3) Ages 59-60	(4) Ages 61-62	(5) Ages 63-64	(6) Ages 65-66
Panel A: State-Cohort Fixed Effects						
No RHI x Post 2014	-0.075	-0.011	0.042	0.360***	-0.144	-0.179*
	(0.188)	(0.076)	(0.073)	(0.084)	(0.096)	(0.101)
No RHI	0.014	0.026	-0.079	-0.108**	0.032	-0.003
	(0.122)	(0.051)	(0.051)	(0.054)	(0.062)	(0.074)
Panel B: State-Cohort-Education Fixed Effects						
No RHI x Post 2014	-0.559	0.082	0.169*	0.331***	-0.127	-0.233*
	(1.046)	(0.097)	(0.093)	(0.109)	(0.140)	(0.132)
No RHI	-0.023	0.002	-0.095	-0.075	0.023	0.069
	(0.477)	(0.066)	(0.062)	(0.072)	(0.088)	(0.103)
Panel C: State-Cohort-2010 Wage Fixed Effects						
No RHI x Post 2014	0.792	0.076	0.024	0.490***	-0.032	-0.138
	(4.016)	(0.113)	(0.130)	(0.135)	(0.177)	(0.213)
No RHI	-1.061	-0.014	-0.036	-0.190**	-0.073	-0.024
	(2.394)	(0.073)	(0.083)	(0.091)	(0.121)	(0.168)
Mean of DV	0.139	0.161	0.212	0.326	0.431	0.585
N	187	591	723	823	770	675

* $p<0.1$ ** $p<0.05$ *** $p<0.01$. Standard errors are clustered at the household level. All specifications include controls for education level, race, gender, marriage status, and spousal employment, as well as indicators for industry, occupation, job tenure, pension enrollment at current job, and pension enrollment interacted with the post-2014 variable. Panel A includes state-cohort fixed effects. Panel B includes state-cohort-education fixed effects, where education is divided into four bins. Panel C includes state-cohort-2010

Table 5: Effect of the ACA on Retirement Behavior

	Fully Retired					
	(1) Ages 55-56	(2) Ages 57-58	(3) Ages 59-60	(4) Ages 61-62	(5) Ages 63-64	(6) Ages 65-66
Panel A: State-Cohort Fixed Effects						
No RHI x Post 2014	0.040	-0.063	0.034	0.275***	-0.068	-0.161
	(0.167)	(0.069)	(0.070)	(0.081)	(0.084)	(0.100)
No RHI	-0.034	0.055	-0.045	-0.048	0.005	0.049
	(0.109)	(0.046)	(0.047)	(0.050)	(0.057)	(0.073)
Panel B: State-Cohort-Education Fixed Effects						
No RHI x Post 2014	-0.490	0.020	0.147*	0.277***	-0.134	-0.250*
	(0.772)	(0.088)	(0.086)	(0.106)	(0.122)	(0.137)
No RHI	0.037	0.042	-0.044	-0.023	0.021	0.179
	(0.322)	(0.058)	(0.055)	(0.067)	(0.084)	(0.111)
Panel C: State-Cohort-2010 Wage Fixed Effects						
No RHI x Post 2014	1.002	0.001	0.067	0.363***	-0.051	-0.048
	(4.230)	(0.104)	(0.117)	(0.132)	(0.152)	(0.226)
No RHI	-0.995	0.048	-0.027	-0.059	-0.074	0.015
	(2.315)	(0.072)	(0.071)	(0.083)	(0.112)	(0.175)
Mean of DV	0.112	0.112	0.170	0.255	0.323	0.483
N	187	591	723	823	770	675

* $p<0.1$ ** $p<0.05$ *** $p<0.01$. Standard errors are clustered at the household level. All specifications include controls for education level, race, gender, marriage status, and spousal employment, as well as indicators for industry, occupation, job tenure, pension enrollment at current job, and pension enrollment interacted with the post-2014 variable. Panel A includes state-cohort fixed effects. Panel B includes state-cohort-education fixed effects, where education is divided into four bins. Panel C includes state-cohort-2010 wage fixed effects, where wage is based on quintiles of weekly wages.

RHI (column 4), there was an increase in the likelihood that they are either partly or fully retired.

Panels B and C include state-cohort-education and state-cohort-2010 wage fixed effects. One potential concern, as mentioned in section 4.1, was that different groups of workers experienced different labor market conditions following the Great Recession. In particular, workers without RHI, as shown in the descriptive statistics in table 1, tended to be less educated, and to earn lower wages, and experienced more severe labor market shocks during the recession. There is evidence of this in panel A of table 5, where the results for several age groups indicate a decrease in retirement for workers without retiree health insurance after 2014, relative to the comparison group. Additionally, individuals are eligible for Medicare starting at age 65, so the marginal benefit of staying with their employer to retain health insurance is much lower. Therefore, the 65-66 age group can be thought of as an additional comparison group. The statistically significant negative estimates for this group suggest that without controlling for different labor market conditions by wage and education, estimates may be biased. However, with the inclusion of state-cohort-2010 wage fixed effects, results for this age group are no longer significant, and are much smaller in magnitude. This suggests that after controlling for different state labor market conditions by wage group and education level, the estimated coefficients reflect the effect of the ACA exchanges on retirement. Panel C indicates that for workers aged 61 to 62, the ACA led to a 49 percentage point increase in retirement among workers without RHI.

Table 5 reports estimates using full retirement as the outcome. Again, the results suggest that workers aged 61-62 responded to the ACA by retiring. As with the previous table, these results also show that labor market conditions were changing differentially for workers with different education and earning levels, and that the inclusion of the additional fixed effects reduces that bias. After controlling for different labor market conditions, the likelihood of full retirement by age 61 or 62 increases by 36.3 percentage point for workers without RHI.

Taken together, the results in tables 4 and 5 indicate a non-trivial response to the ACA by workers aged 61-62. As mentioned in section 4, it is reasonable to expect that the effect of the ACA on retirement might be larger for this group. 62 is the earliest age at which individuals can begin claiming Social Security benefits. Therefore, we may expect a larger response to the policy shock for workers who are nearing age 62. These workers, now able to purchase affordable non-group health insurance, are choosing to retire as soon as they are eligible for Social Security benefits, rather than waiting until they are eligible for Medicare.

The following is a back-of-envelope calculation of how many additional workers would have retired early as a result of the exchanges, all else held constant. According to ACS data, there were 2.3 million workers in the U.S. who had not retired by age 56 in 2008 through 2010, who had employer-sponsored health insurance. In my HRS sample, 63% of workers with ESHI did not have retiree health insurance. Taken together, this implies that 1.45 million workers were subject to retirement lock. I predict that exchanges increased the probability of retirement by age 62 by 49 percentage points relative to what would have happened without the exchanges. This translates into roughly 700,000 workers retiring early as a result of the exchanges, all else held constant.

To give my results some context, I compare them with prior estimates on the effect of continuation of coverage laws on retirement. Gruber and Madrian (1995) find that 1 year of continuation of coverage increases the probability of retirement by 32.1%. Continuation of coverage laws allow the individual to stay enrolled in their employer-sponsored health insurance plan, often while paying the full premium. Because the individual pays the entire cost, these laws did not lead to a large monetary cost saving over individual non-group insurance plans. Much of the value, the authors argue, comes from challenges in purchasing non-group health insurance that would make it difficult or impossible for an early retiree to get adequate coverage. Likewise, the Affordable Care Act, in addition to providing cheaper non-group plans (through more competition, attempts to circumvent adverse selection, and explicit premium subsidies), also increased insurance availability for older, potentially less-healthy workers through mandates such as community rating and guaranteed issue. Therefore, an effect of 49 percentage point is in line with previous findings, given that the ACA potentially allowed workers to retire several years earlier than they otherwise may have.

6 Heterogeneous Effects by Type of Exchange

Following the passage of the Affordable Care Act, states were given the option of developing and managing their own health insurance exchange, or adopting a federal health insurance exchange. 14 states initially opted to establish their own exchanges (Frean, Gruber, and Sommers, 2017) [7]. There are two reasons to suspect that states that established their own exchanges would have seen larger increases in retirement post-2014 than states that adopted the federal exchanges.

Firstly, the federal exchange was plagued with technical issue which led to decreased enrollment. Although several state-based exchanges experienced their own issues, Hamel, Blumenthal, and Collins (2014) found that states with well-functioning insurance exchanges contributed significantly to the uptick in enrollment in 2014. In addition, the states that adopted the federal exchanges more often imposed regulations on outreach and were less engaged in outreach and enrollment efforts (Shin et al., 2014). As a results we might expect that due to reduced outreach and to more negative perceptions of the exchanges, individuals in those states may have been less likely to consider the exchanges a viable source of retiree health insurance.

Table 6 contains results for a test of heterogeneous effects between states that adopted the federal exchange and states that established their own exchanges. Interestingly, states that developed their own health insurance exchanges saw smaller increases in retirement among individuals aged 61-62, although the results are not statistically significant. One possibility is that those states already had more generous health insurance regulations or continuation-of-coverage laws, which led to earlier retirement prior to 2014. In this case, the effect of the ACA exchanges may have been smaller than in states that previously had less-generous laws and regulations. However, further analysis is required to uncover the exact mechanism.

[7] These states were CA, CO, CT, DC, HI, ID, KY, MA, MD, MN, NY, RI, VT, and WA.

Table 6: Differential Retirement Effects of ACA by Exchange Type

	(1) Ages 57-58	(2) Ages 59-60	(3) Ages 61-62	(4) Ages 63-64	(5) Ages 65-66
Partly or Fully Retired					
No RHI x Post 2014 x State Exchange	-0.041	-0.019	-0.225	-0.041	-0.443
	(0.240)	(0.313)	(0.301)	(0.356)	(0.471)
No RHI x Post 2014	0.090	0.035	0.551***	-0.016	-0.020
	(0.150)	(0.155)	(0.159)	(0.201)	(0.248)
Mean of Y	0.162	0.207	0.320	0.432	0.572
N	531	657	748	703	610
Fully Retired					
No RHI x Post 2014 x State Exchange	0.017	0.020	-0.269	-0.616**	-0.308
	(0.221)	(0.270)	(0.279)	(0.312)	(0.517)
No RHI x Post 2014	-0.006	0.068	0.435***	0.134	0.035
	(0.141)	(0.144)	(0.163)	(0.179)	(0.252)
Mean of Y	0.113	0.161	0.249	0.319	0.469
N	531	657	748	703	610

All specifications include controls for education level, race, gender, marriage status, and spousal employment, as well as indicators for industry, occupation, job tenure, and pension enrollment at current job, and pension enrollment interacted with the post-2014 variable. All specifications also include state-year-2010 wage fixed effects. The `State Exchange' variable takes a value of 1 if the state developed their own health insurance exchange, and a value of 0 adopted the federal exchange. Note: Ages 55-56 were omitted because standard errors could not be calculated.

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