Health Care Reform and Labor Supply of Older Workers; Employment lock and Retirement

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Abstract

This paper examines features of the Massachusetts health care reform and their impact on the labor supply decision of older workers approaching retirement age. The individual-mandate and availability of affordable health insurance in the marketplace may weaken the link between the employment and health insurance. Whereas the employer-mandate applied to employers hiring more than 11 full-time-equivalent employees implies more workers are offered a health insurance benefit, which may increase the incentive for workers to remain employed. Given these conflicting effects, I compare Massachusetts with other states in the Northeast region, pre- and post- reform using difference-in-difference and triple-difference frameworks. The results show that the early retirement hazard declines significantly among Massachusetts residents between the pre-reform period (2001-2006) and post-reform period (2008-2013) despite the economic recession following the reform. The reduction in the early retirement hazard is larger among individuals who were covered by employer-sponsored health insurance.

1 Introduction

The majority of privately insured Americans obtain health insurance through their own or family members' employment until they become eligible for Medicare at age 65.[1] Many studies provide evidence that health insurance availability affects labor market behaviors based on this strong link between employment and health insurance availability (Blau and Gilleskie (2001); Madrian (1994); Gruber and Madrian (2004)).

Older populations are eligible for Medicare as they become age 65, but the time gap between the Medicare eligibility and retirement are important deterrents for retirement. Thus employement lock induced by employer-sponsored health insurance (ESI) could be stronger among older workers on the margin of retirement because medical expenditure is more likely to be high among this group.[2] At age 65, individuals are covered by Medicare so the employment lock effect will decline. However for individuals contemplating early retirement, the presence of insurance on the job and the lack of insurance off the job may be an important deterrent to leaving employment.

I focus on individuals approaching retirement age and their labor supply decision, mainly on the extensive margin; work or exit.[3] To my best knowldege, Garthwaite et al. (2013) is the only study done so far on the relationship between employment lock and health insurance. However, they investigate the Medicaid availability for low income population which is not conditional on the employment, while I am more likely to capture the effects of ESI, health insurance conditional on the employment.

Massachusetts enacted health care reform in 2006 to acheive universal health insurance coveage for state residents. Related to labor supply, Massachusetts health care reform (MA reform) contains components with conflicting expected effects labor supply. Some features in MA reform may weaken the employment lock and others can enhance the phenomenon; an individual-mandate requires individuals to purchase health insurance and reduces the adverse-selection in private insurance market, regulations on non-group health insurance market make affordable health insurance

[1] 88.9% of privately-insured population get health insurance through empoloyer-sponsored insurance (KFF, 2013).

[2] The medical spending of 55-64 years old is almost twice as large, and twice as variable as that of 35-44 years old (Long, 2008).

[3] I use the term "employment-lock" rather than "job-lock" which is more focused on role of health insurance reducing job mobility, because I focus more on labor supply at the extensive margin.

available outside employment. Also the expansion of public insurance and subsidized health insurance would weaken the link between employment and health insurance. On the other hand, the employer-mandate increases opportunity for workers to obtain their health insurance through employment thus possibly reinforcing the link between health insurance and employment. Employers who previously did not offer health insurance to their employees would provide health insurance under the reform and some individuals would postpone retirement to receive health insurance and retiree health insurance.[4]

Massachusetts health care reform provides quasi-experimental opportunity to examine how health insurance reform can affect labor supply as a precursor to the Affordable Care Act (ACA) reform.[5] Based on Massachusetts' quasi-experimental reform, I try to examine labor supply behavior of individuals empirically. First, I employ *difference-in-differences*(DD) method which compares outcomes of Massachusetts residents to outcomes of residents in other Northeast region before and after the health care reform.[6] Also, I restrict the treatment group to Massachusetts residents who were covered by ESI in the previous year and estimate *difference-in-difference-in-differnences*(Triple-differences, DDD) model to examine how those treatment group are affected by the health care reform.

I find that the Massachusetts health care reform caused a significant decline in early retirement hazard of Massachusetts resident older workers. Compared to pre-reform period, the retirement hazard declined by 4.5%. Also the decrease in retirement does not make more people move to part-time employment contrary to other studies on ACA predicted that part-time employment will increase. The effect of decresing early retirement is more stronger among individuals who were covered by ESI which suggests that individuals are more likely to remain in full-time employment though health insurance options outside employment are available. However, individuals eligible

[4]Continuation of coverage laws (COBRA: Consolidated Omnibus Budge Reconciliation Act) mandate employers must allow employees and their dependents the option to continue purchasing health insurance through the employer's health plan for a specified period of time after coverage would otherwise terminate. The federal government mandated this coverage at the national level in 1986, I assume the retirement preference and behavior in this paper are already taken the availabiltiy of retiree insurance into consideration.

[5]CBO predicts ACA would reduce labor supply due to features of reform.

[6]The U.S. Census Bureau define that the Northeast region includes New England, Middle Atlantic divisions according to the definition of Census. Conneticut, Maine, New Hampshire, Rhode Island, Massachusetts, Vermont are in New England Division. There are New York, New Jersey and Pennsylvania in Middle Atlantic division.

for subsidized health insurance reduced labor supply at the intensive margin, though they also did not exit completely from the labor force.

Many key features of Massachusetts health care reform are applied in the Patient Protection and Affordable Care Act (ACA) which represents the most significant health care reform in the United States in the past 40 years.[7] Massachusetts' experience with health care reform could be a precursor to national health reform to some extent. My results provide insight regarding the potential for older workers' labor supply effects from the implementation of the ACA.[8]

This paper is organized as follows. In section 2, I provide detailed description of Massachusetts health care reform and channels that the reform might affect labor supply of older workers. Section 3 describes the data sources and triple differences model I use in the analysis. Section 4 presents empirical results and section 5 concludes.

2 Massachusetts Health Care Reform

In 2006, Massachusetts enacted comprehensive health care reform to bring universal health insurance coverage to residents in the state. The reform created plans including reform of the nongroup health insurance market to make private health insurance affordable and easily accessible through the Health Connector ; individual-mandate, a requirement that all Massachusetts residents age 18 and over must have health insurance; expansion of public insurance including Medicaid (MassHealth) and subsidized health insurance (Commonwealth Care); and an employer-mandate that requires employers with 11 or more full-time-equivalent (FTE) employees to provide health insurance benefits to their employees.

The Massachusetts reform began to be implemented in July 2006 and was fully implemented by July 2007. Under the reform, there was a reduction in nongroup insurance prices; more firms offered health insurance benefits to their employees and increased the share of employers providing health insurance benefits to their employees.[9] The number of uninsured dropped by two-thirds and

[7] Since the enactment of Medicare and Medicaid in 1965.

[8] However the employer-mandate feature in ACA is less restrictive compared to Massachusetts. ACA required employers at least 50 full-time-equivalent employees and above to offer health insurance benefit to their employees.

[9] Employer-mandate applied to employers with 11 or more FTE employees. However, even employers who are not subjected to mandate offered health insurance benefits after the reform. Firms with 3-10 employees offering health

Massachusetts has continued as state with the lowest uninsured rate.

The features of MA reform may affect labor supply and labor demand through various channels. Low-income individuals are eligible for subsidies to purchase health insurance through Health Connector. People with income below 150% of FPL are fully subsidized and subidies decline with rising income up to 300% of FPL. For some people, the availability of subsidies could reduce incentives to work both through a substitution effect and an income effect. People could reduce their labor supply because of a subsidy as a transfer of income (income effect). The slinding scale of subsidies is equivalent to an increase in marginal tax rates, thus some individuals could reduce labor supply in response (subsitution effect).[10]

Under the reform, employers with 11 or more full-time-equivalent employees have to offer health insurance benefit to their employees. If not, they will face a penalty (employer-mandate). Employer-mandate can affect both the labor demand and labor supply sides. Employers could impose on employees' compensation and this could reduce the supply of labor responsive to changes in compensation. However, Koldstad and Kowalski (2012) estimate the welfare impact in compensation under the MA reform and the total compensation would stay about the same and labor supply would not be affected by the change in employer coverage.[11] On the other hand, more workers have a chance to be covered by ESI, and this could increase the chance to remain in work in order to be covered by ESI under the expansion of ESI. Also employers may have incentive to reduce hiring or shift their demand toward part-time from full-time labor demand.[12]

Regulations over nongroup market make affordabe health insurance available outside employment. Older populations who expect higher medical expenditure would value health insurance more than younger populations. They are more likely to be attached to employers due to health insurance and employment lock may be stronger than that of yougner population until being eligible for Medicare. However, regulations over nongroup market prohibiting exclusion of pre-existing

insurance benefit increased from 14 percent to 22 percent in 2007.

[10]However, most full-time employees are not eligible for this subsidy under the employer-mandate feature. Individuals who are offered employer-sponsored health insurance are ineligible for subidized health insurance regardless of their income.

[11]Individuals value ESI, mandate-based health reform in Massachusetts resulted in significantly less distortion to the labor market than it would have otherwise.

[12]However, Congressional Budget Office expected that a reduction in labor from demand side barely exist from employer-mandate feature in ACA (CBO, 2013).

conditions and higher preimiums for age lower health insurance cost for older population. This enables older workers to leave labor market earlier and reduces labor supply. Also, expansion of public insurance will weaken the link between employment and health insurance and possible to reduce labor supply.

Based on these features of health care reform which can affect labor market behavior, I examine how older workers responded on to the change in heatlh insurance system in Massachusetts.

3 Data and Empirical Strategy

3.1 Data

The primary data for the analysis are from the March Annual Social and Economics Supplement of Current Population Survey (March CPS) for 2001-2013. The March CPS provides comprehensive labor market status information of current month and previous year's. This allows me to identify the transition of labor market status of older workers who were employed in the preceding year. Also the data provide detailed demographics including marital status, family structure, education, health status. Each March CPS asks respondents about their health insurance coverage in the previous year.

To identify labor supply behavior of older workers with a focus on retirement, I restrict the March CPS sample to male individuals approaching retirement between ages 55 and 64.[13] I restrict samples aged under 65 to avoid confounding effects from Medicare eligibility. Eligibility for Medicare at age 65 is viewed as an important factor in retirement decisions in many literatures (Rust and Phelan (1997), Gruber and Madrian (1994)).[14]

For the labor market variables, I restrict sample to individuals who were employed full-time at least a week in the previous year.[15] Current labor market status follows information of monthly

[13]I exclude female population due to lower labor force participation and higher dependency on spouse's health insurance plan.

[14]People under age 65 with certain disabilities quialify for Medicaid or Medicare enrollment through disability insurances. I exclude population who are disability insurance beneficiaries by restricting sample who were employed full-time in the previous week.

[15]Full-time work is defined as working 35+ hours a week. The number of hoours worked is based on the number of reported hours worked in the previous week.

labor force and worker status information.

With these restrictions, the treatment group is male residents of Massachusetts ages 55 to 64 who were employed to at least one employer at least one week during the previous year, and the control group is male residents in other states of Northeast region in the same age group. Since MA health care reforms were enacted and implemented from July 2006, I define 2001-2006 as the pre-reform period and 2008-2013 as the post-reform period. To avoid the potential confounding effects from the economic recession, which began in December of 2007, I prolong the time span of analysis years after the recovery from the recession (NBER 2008, 2012).[16] In 2014 January, Affordable Care Act (ACA) has enacted nationwide, thus Massachusetts has to amend some features of health care reform consistent with features of ACA, thus the post-reform period ends in 2013.

Table 1 presents summary statistics for residents in Massachusetts and those in other states in Northeast region for pre-reform period (2001-2006) and post -reform period (2008-2013). Summary statistics demonstrate that the treatment group and control group are comparable in the pre-reform period. In the pre-reform period, residents in Massachusetts are slightly less likely to have employer-provided health insurance and more likely to be covered by Medicaid. It is because Massachusetts is more generous in Medicaid provision even before health care reform compared to other states. Overall labor market status transition are similar, with Massachusetts having a slightly lower retirement hazard, less likely to move to part-time job. Racial composition is also similar between Massachusets and the rest of the Northeast, with Massachusetts population being more likely to be white. Massachusetts residents are more educated and more likely to have higher income than residents in other states.

Massachusetts health care reform enacted only targeting residents in Massachusetts and migration across states in seeking of benefits of different social program has no evidence (Schwartz and Sommers (2014)).[17]

[16]The National Bureau of Economic Research determined that the peak in U.S. economy activity occurred in December 2007 and declared June 2009 as the trough of the business cycle.

[17]Welfare magnet hypothesis which is claiming that geographic variations in social program induces the migration of welfare receipients to places with more generous benefits or eligibility.

3.2 Empirical Strategy : DD and DDD

This section presents main empirical strategies used in the analysis. I first examine how the Massachusetts health care reform affected health insurance coverage of individuals, and then examine changes in labor supply status and how these changes varied by demographic groups.

To identify how Massachusetts health care reform affected health insurance coverage I first estimate difference-in-difference regressions of the following form:

$$y_{ist} = \beta_0 + \mathbf{X}'\beta_1 + \beta_2 MA_s + \beta_3 Post_t + \delta * MA_s * Post_t + \gamma_t + \lambda_{st} + \epsilon_{ist} \quad (1)$$

where MA_s is a dummy variable indicating Massachusetts residency, $Post_t$ is a dummy indicating years from 2008 onward, and the variable y_{ist} represents health insurance status of an individual i in state s and year t including employer-sponsored health insurance, private insurance purchased in the market and Medicaid. $\mathbf{X}$ is a vector of individual characteristics including age, race, marital status, education, family income, existence of dependent children (under age 18), reported health status, industry and occupation dummies. γ_t is a full set of year dummies and λ_{st} is state-specific time trend to conrol for unobserved factors evolving differently over time across states. Error term ϵ_{ist} is clustered on state. The key interesting coefficient on the interaction term δ captures the effect of Massachusetts health care reform on health insurance coverage. This coefficient is identified by comparing outcomes in Massachusetts after the reform to outcomes in Massachusetts before the reform and to other Northeastern states.

As explained above in Section 2, features of Massachusetts health care reform may affect labor supply of older workers. To identify the causal effect of the Massachusetts health care reform on labor market outcome of older workers, I first estimate difference-in-differences regressions on labor supply of older male population using the same form of equation (1). The dependent variable y_{ist} in labor supply analysis is an indicator of labor market status changes from full-time employed in the previous year.[18] The indicator includes being retired, being self-employed and being employed part-time employed.[19]

[18] Full-time employed indicates working more than 35 hours a week.

[19] Part-time employed indicates working less than 35 hours a week. Being retired is an indicator if an individual

I estimate the effect of the Massachusetts health care reform on labor supply behavior of older workers and key interest lies on retirement behavior. The estimation strategy compares male population in the Massachusetts pre- and post-reform period and other states in the Northeast Census region using difference-in-differences method. All individuals in the sample are employed full-time at least a week during the preceding year.

Difference-in-difference-in-differences (DDD)

I try to identify heterogeneity in labor supply responses to health care reform among individuals who were offered ESI. Individuals who were previously offered ESI are more likely to have additional health insurance options outside employment through the health care reform. Thus I exploit population group who were covered by ESI in the previous year and employ *difference-in-difference-in-differences*(DDD) method, comparing older males covered by ESI in Massachusetts to others in Massachusetts who are not covered by ESI. The triple-difference regression model takes the following form:

$$\begin{aligned} y_{ist} = \beta_0 + \mathbf{X}'\beta_2 + \beta_3 MA + \beta_4 ESI + \beta_5 Post + \beta_6 MA * Post + \beta_7 MA * ESI \\ + \beta_8 Post * ESI + \delta MA * Post * ESI + \gamma_t + \lambda_{st} + \epsilon_{ist} \end{aligned} \tag{2}$$

The variable y_{ist} represents the outcome of interests used in DD regression. The triple-difference model includes a full set of fixed effects and all of the two-way interaction terms and triple interaction term between dummy for Massachusetts residency, dummy for Post-reform period and previous year's ESI coverage. The key coefficient of interest is δ the triple-difference estimate of the effect of Massachusetts reform on older males who were covered by ESI relative to other adults.

To examine the robustness of results, we exploit the fact that the availability of affordable health insurance unlinked to employment could affect employed workers labor supply behavior. Through triple-difference analysis, I compare older male population who were employed and covered by

declared he is not in the labor force as being retirement. However some individuals regard themselves as being retired if they quit their main full-time job. Thus I restricted retired individuals to whom declared retirement and did not work at all.

employer-sponsored health insurance (ESI) in Massachusetts to other older male population in Northeast region before and after the MA reform.

4 Results

Table 2 presents regression estimates on health insurance coverage. After the MA health care reform, probability of being covered by employer-sponsored health insurnace (ESI) in Massachusets increased significantly by a 5.66 percentage points which corresponds to 8.7% of baseline probability of being covered by ESI. Though some predictions on ACA reform suggested that that individuals would leave full-time job offering ESI benefit and attain private health insurance, but those effects are not significant in Massachusetts, though outside-employment health insurance option became available. Partly, it is due to difference in detailed features of employer-mandate in MA reform and ACA reform.[20]

Privately purchased health insurance decreased by 1.33 percnetage points and Medicaid coverage increased by 2.01 percentage points. This change implies that labor supply driven by the demand for health insurance possibly mainly comes from demand for ESI and extended availability of ESI even among small firms enhance employment lock. The health insurance status is concentrated in ESI which is expected to be the main factor determining labor supply decision.

Table 3 presents the primary results of DD estimates; the coefficients of(MA*Post) and DDD estimates; the coefficients of triple interaction term, (MA*ESI*Post). Reported coefficients for all regressions are marginal effects from probit regressions of equation (1) and equation (2). Three types of labor supply behaviors are included; (1) being retired (2) being part-time employed and (3) being self-employed. All individuals in regressions are males aged 55-64 who were full-time employed in the previous year.

Panel A. of Table 3 presents DD estimates, coefficents for MA*Post. As a result of MA health care reform, the retirement hazard drops by 0.21 percentage poits for an individual with average characteristics. Relative to pre-reform period average, this is about a 4.5% decline in the probability

[20] ACA reform mandate employers with at least 50 full-time-equivalent employees to offer health insurance benefit while the threshold in Massachusetts is 11.

that an older worker ceases to work. While the magnitude of this estimate is not large, it is likely to be a lower bound because the effect is on the entire older male population including individuals who are eligible for subidized health insurance. If income effect from subsidized insurance is not negligible, then the effect of health care refom on reducing early retirement could be larger.

Panel B. of Table 3 provides DDD estimates, coefficients for MA*ESI*Post. Individuals in Massachusetts who were covered by ESI in the previous year are less likely to retire in post-reform period. The retirement hazard drops by 0.89 percentage points which corresponds to 20% of baseline retirement hazard of individuals who were covered by ESI in the previous year.[21]

While retirement hazard decreases significantly, the probability of transition from full-time employed to part-time employed does not see any significant changes. The majority of older Americans leaving full-time career employment moved first to a bridge job rather than directly out of the labor force (Cahill et al. (2006)). The results suggest that older individuals are more likely to remain in the full-time employment as a way to secure health insurance under the individual-mandate scheme though MA health care reform made affordable health insurance be available outside employment through new health insurance exchange system. This result conflicts with other predictions of the effects of the Affordable Care Act reform on labor supply. The existence of new health insurance exchange system would promote workers to move to part-time status without fear of losing health insruance before retirement as a bridge job and leave employer-sponsored health insurance (Gallen and Mulligan (2013)). I also examine the effect of Massachusetts reform on the probability of self-emplyment. Consistent with the employment-lock effect of ESI, the decrease in the probability of self-employment is expected. After the Massachusetts reform, the probability of being self-employed decreases by 1.84 percentge points (DD estimate). The results suggest that there exists employment lock effect from Massachusetts health care reform. Individuals are more likely to remain in full-time employed status.

However, there may be heterogeneous effects across different demographic groups due to possible income effects from subsidized health insurance and different preferences toward health insurance. To identify whether the labor supply behavior varies across groups in response to health care reform,

[21]The baseline retirement hazard for Massachusetts residents covered by ESI in the pre-reform period is 4.42%.

I separate samples by subsidized health insurance eligibiltiy, age and education level. Table 4 and Table 5 show DD estimates and DDD estimates by three demographic groups respectively.

Providing free health insurance outside employment decreases work incentive for older workers. If there exist income effect from receiving subsidized health insurane, the reform generates different labor supply patterns among older workers based on subsidy eligibility. Thus I separate the sample according to the eligibility for subsidized health insurance and examine how their labor supply behaviors are different with.[22] Individuals are eligible for subsidized health insurance if their family income is less than 300% of FPL and do not have ESI option. Subsidized health insurance have both income effect and substitution effect as explained in Section 2. It is expected that individuals who are eligible for subsidized health insurance are more likely to reduce labor supply due to income effect. Substitution effect is also expected to reduce the labor supply due to its sliding scale. Decrease of the amount of subsidy along income level implicitly increases the marginal tax rate and this could result in reduction in labor supply.

Panel I. in Table 4 presents estimates for groups eligible for a subsidy and ineligible for a subsidy. Among the subsidy-eligible population, the labor supply reduction at the extensive margin is smaller compared to individuals who are ineligible for subsidy, which is not consistent with the prediction of theory. However, reductions in labor supply at the intensive margin are more likely to occur as movement to part-time work increases significantly. Contrary to reduction in probabiltiy of transition to part-time for population who are not ineligible though it is not statistically significant, probability of transition from full-time employed to part-time employed rise significantly by 2.08 percentage points for individuals who are eligible for subsidy. This result is consistent with other predictions related to ACA that increase of part-time labor supply (CBO (2013)).[23]

Older populations are more likely to react more sensitively to health insurance availability because their expected medical cost is higher thus they value health insurance more highly. I separte the sample by individuals ages 55-59 and individuals 60-64 to identify different effect according to age.

[22]Massachusetts provided fully-subsidized coverage under the Commonwealth Care program to adults up to 100 percent of the FPL as of October 2006, with the full subsidy expanded to include adults up to 150 percent of the FPL as of 2007. Partially subsidized coverage was provided to adults between 150 percent and 300 percent of the FPL as of July 2007. According to these rules, I split sample with family income above 300% of FPL.

[23]It is also possible the change to part-time came from labor demand side. Employers can reduce full-time employment and shift to part-time employment as a way to reduce burden of offering health insurance benefits.

While individuals aged 55-59 does not show any significant change in retirement hazard before and after reform, individuals aged 60-64 reduces retirement hazard significantly by 1.05 percentage points which corresponds to 16.5% of the baseline retirement hazard. Also the change in retirement are more likely to remain in full-time employment.

Massachusetts health care reform also may have heterogeneous effects across different education level: those with higher education are more likely to be employed by an employer who offers ESI benefit already while those with less eudcation level are not. If the employer-mandate increases the chance for less-educated population to be covered by ESI, then those with less education are more likely to remain in full-time employment to obtain ESI. The DD estimate for less educated population shows that the probability of retirement hazard decline significantly by 0.80 percentge points and the probability of transition to part-time employed also declines significantly.

Table 5 illustrates DDD estimation of the effect of MA health care reform on labor supply behavior transition by demographic groups. The treatment group is older males who were covered by ESI in the previous year in Massachusetts. Since individuals in the treatment group is not eligible for subsidized health insurance unless they quit /retire, it is expected that employment-lock from health care reform would be larger in the absence of income effect from subsidies. The results is consistent with expectation. The magnitude in reduction of retirement is a lot larger among males in Massachusetts who were covered by ESI in the previous year.

5 Conclusion

The Massachusetts health care reform contains several features that could affect labor supply and labor demand. The employer-mandate imposing penalty on employers who do not offer health insurance benefit to their full-time employees can result in reduction in full-time worker hiring. However employer-mandate also increases chance to be covered by ESI for workers who previously weren't covered by ESI and induces them to remain in the labor market as full-time workers to obtain health insurance and increases employment-lock. On the contrary, subsidized health insurance and improvement in private health insurance market can reduce employment lock due to employer-sponsored health insurance and make early retirement less expensive for older workers.

In conclusion, I find that Massachusetts health care reform reduces early retirement of older workers ages 55-64. The retirement hazard decreases by 4.5% in Massachusetts compared to pre-reform period (2001- 2006). However, I cannot find evidences of increase in part-time labor supply which is predicted from ACA implementation though key features of ACA are based on those of Massachusetts reform.

The results suggest that Massachusetts reform reinforces employment-lock effect and individuals tend to remain in labor market as full-time employed as availability of ESI increases by employer-mandate. The reduction in retirement hazard is significantly larger among population who were covered by employer-sponsored health insurance. This result suggests that employment-lock effect coming from ESI has been increased by increase in the number of employers who offer health insurances to their employees after reform among older workers approaching retirement age.

The labor market status change varies across demographic groups. Availability of subsidized health insurance makes early retirement less expensive and increases disincentive to work. Consistent with theory predicts, low-income population who are eligible for subsidized health insurance reduces labor supply. However they are more likely to reduce labor supply at the intensive margin but extensive margin. They reduces early retirement and they are more likely to reduce labor supply at the intensive margin and to move to part-time employment. Low-educated population also shows significantly different pattern with college-graduated population. The retirement hazard decreased significantly after the reform and movement to part-time employed also decreased. The result suggests that more less-educated older population remain employed as full-time employee compared to pre-reform period.

However, these changes in labor market status do not necessarily from labor supply side responses. The shift to part-time labor may result from labor demand side as employers shift labor demand to part-time employed to avoid penalty. Also the change in attractiveness of other welfare program after health care reform affect labor market equilibrium. For example, individuals with disabilities can have other health insruance options than disability insurances (DI). This may lead changes in pattern of exit from labor market for older workers because they don't have to leave employment to qualify DI if they have other affordable health insurance options.

It is possible that the differences between the Massachusetts and federal laws will lead to a different result for the Affordable Care Act. However the big picture drawn here suggests that the negativity is not really large even among older population whose movemen to reducing labor supply is less expensive compared to younger counterparts.

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Massachusetts Health Care Reform Features

- **Individual-mandate:** All Massachusetts residents age 18 and over must have health insurance. Every year, residents need to show proof of health insurance on state income tax return. If individuals do not have health insurance, the state imposes a tax penalty varying from $240 to $1,100 a year depending on income.[24]

- **Employer-mandate:** Under Massachusetts law, employers with eleven or more full-time equivalent (FTE) employees had to allow non-benefits-eligible employees to purchase individual health insurance coverage from the general marketplace using pretax salary reduction contributions under a Section 125 cafeteria plan.

- **The Commonwealth Care Health Insurance Program** provides sliding-scale subsidized health coverage for individuals with incomes below 300% of the Federal Poverty Level (FPL). Individuals up to 150 % FPL are eligible for fully subsidized coverage through the program.

- **Commonwealth Health Insurance Connector:** the health insurance exchange system which residents can have access to affordable private health insurance.

- **MassHealth (Medicaid):** MassHealth Expansion raised enrollment caps of states Medicaid and Childrens Health Insurance Program (CHIP) for children and adults. Medicaid and CHIP were expanded to cover children with family incomes up to 300% FPL and to cover adults up to 100% of FPL.

- **Reform on nongroup insurance market:** The state prohibit insurers from denying coverage to people wit hpreexisting conditions.

[24]The penalty amounts up to 50% of the amount of the cheapest health insurance plan offered through the Commonwealth Connector.

Tables

Table 1: Summary statistics

	Massachusetts		Other states in Northeast	
	Pre	Post	Pre	Post
	N = 689	N = 739	N = 6977	N = 10,189
Age	58.51	58.87	58.58	58.77
Married	0.778	0.732	0.791	0.762
Family income	101,546	117,850	94,183	108,808
Family income less than 300 % of FPL	0.174	0.175	0.196	0.208
Race				
White	0.919	0.894	0.891	0.879
Black	0.0427	0.0582	0.0721	0.0691
Native American	0.00427	0.00271	0.00238	0.00353
Asian	0.0342	0.0447	0.0348	0.0479
HS grad	0.229	0.245	0.3	0.303
Some College	0.197	0.188	0.208	0.221
College+	0.45	0.517	0.381	0.405
Employer-sponsored health insurance	0.653	0.666	0.681	0.625
Covered by Medicaid	0.0218	0.0812	0.0179	0.0344
Reported Health Status				
Very Good	0.379	0.36	0.348	0.372
Good	0.251	0.225	0.294	0.276
Fair	0.074	0.0568	0.083	0.0793
Poor	0.0145	0.0149	0.0208	0.0166
Changed to PT from FT last year	0.0218	0.0365	0.0248	0.0337
Retired within a year	0.0464	0.0311	0.0466	0.0348
Occupation				
Management	0.0581	0.0528	0.0635	0.0468
Professional	0.21	0.195	0.192	0.198
Service	0.219	0.271	0.173	0.196
Sales	0.102	0.0785	0.097	0.108
Administrative	0.106	0.0839	0.102	0.0929
Farming	0.0508	0.0582	0.0589	0.0556
Construction	0.0102	0.00271	0.00889	0.00579
Installation	0.045	0.0771	0.0631	0.0762
Production	0.029	0.0433	0.0548	0.0517
Transportation	0.118	0.0677	0.108	0.081

Notes: This table reports summary statistics for the CPS data used in the main analysis. Other states in Northeast include the 8 states in the Census Northeast region other than Massachusetts. The sample is restricted to male population ages 55 to 64 who were employed in the previous year. Person level CPS March weights are used.

Table 2: The Effect of the MA Health Care Reform on Health Insurance Coverage

	(1)	(2)	(3)
	ESI	Private Insurance purchased	Medicaid
Massachusetts	-0.0433**	-0.0294***	0.0235***
	(0.0169)	(0.00708)	(0.00158)
Post-Reform Period	-0.137***	0.00553	0.0299***
	(0.0308)	(0.0091)	(0.00756)
Ma*Post	0.0566***	-0.0133***	0.0201***
	(0.00638)	(0.00304)	(0.00209)
Aged 60-64	0.0163*	0.0139***	-0.00882***
	(0.00838)	(0.00355)	(0.00267)
College+	0.0217***	0.00995**	-0.0137***
	(0.00524)	(0.00394)	(0.00353)
Subsidy	-0.221***	0.0202***	0.0409***
	(0.0111)	(0.00688)	(0.00657)

Note: Coefficients are from a probit regression eq.(1). Marginal effects are reported. Regression includes age, race, education, marital status, health status, industry and occupation dummies, year dummies and state-specific time trends. Robust standard errors are clustered on state. Individuals in the regressions are male population ages 55-64 who were full-time employed at least a week in the previous year. Standard errors in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Table 3: The effect of Massachusetts health care reform on labor supply status trasition in a year

	(1) From FT employed to Retired	(2) From FT employed to PT employed	(3) From FT employed to Self-employed
		A. Difference-in-Difference Estimates	
MA*Post	-0.00208***	-0.00174	-0.0184*
	(0.000458)	(0.00339)	(0.00945)
		B. Triple - Difference Estimates	
MA*ESI*Post	-0.00891*	0.00874	-0.0158
	(0.00471)	(0.00762)	(0.0122)
MA*Post	-0.00728***	-0.000381	-0.00861
	(0.00198)	(0.00350)	(0.00907)

Note: For Panel A, N = 16,442 and the probit regression and for Panel B, N = 16,280. Coefficients are from a probit regression eq.(1). Marginal effects are reported. Rgression includes age, race, education, marital status, health stuatus, industry and occupation dummies, year dummies and state-specific time trends. Robust standard errors are clustered on state. Individuals in the regressions are male population ages 55-64 who were full-time employed at least a week in the previous year. Standard errors in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Table 4: Difference-in-difference effects by groups

	(1)	(2)	(3)
	Retired	Part-time	Self-employed
	I. Subsidy for health insurance		
Ineligible for subsidized health insurance	-0.00173**	-0.00421	-0.0174
	(0.000743)	(0.00337)	(0.0115)
Eligible for subsidized health insurance	-0.00735***	0.0208**	-0.0166*
	(0.00224)	(0.00870)	(0.00884)
p-value of test for equality across group	0.0000	0.0002	0.2999
	II. Age		
Individuals aged 55- 59	0.000185	-0.00917***	-0.00220
	(0.000530)	(0.00297)	(0.00984)
Individuals aged 60- 64	-0.0105***	0.00767	-0.0313***
	(0.00162)	(0.00611)	(0.0101)
p-value of test for equality across group	0.0007	0.0000	0.0007
	III. Education		
College graduates	0.00121	0.00542*	-0.0122
	(0.000992)	(0.00328)	(0.00992)
No college degree	-0.00803***	-0.0144***	-0.00717
	(0.00148)	(0.00498)	(0.00774)
p-value of test for equality across group	0.0000	0.000	0.9619

Notes: Coefficients are from a probit regression eq.(1). Marginal effects are reported. Rgression includes age, race, education, marital status, health stuatus, industry and occupation dummies, year dummies and state-specific time trend. Robust standard errors are clustered on state. Test for equality across group reports whether the coefficient of Mass*Post for one groups is statistically sigificantly different from the other. The eligibility for subsidy is determined by family income. Individuals whose family income is between 150% of FPL and 300% are eligible for subsidized private health insurance on sliding scale and individuals with family income is lower than 100 % FPL are eligible for Medicaid and eligible for fully-subsidized health insurance if family income is between 100% of FPL and 150% FPL. I treat all individuals with family income under 300% of FPL are eligible for subsidy. Robust standard errors are in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Table 5: Triple-difference estimates by groups

	(1)	(2)	(3)
	Retired	Part-time	Self-employed
	I. Subsidy for health insurance		
Ineligible for subsidized health insurance	-0.0162***	0.0143**	0.00540
	(0.00470)	(0.00714)	(0.0179)
	II. Age		
Individuals aged 55- 59	-0.00263	0.0112	-0.00135
	(0.00517)	(0.00903)	(0.0164)
Individuals aged 60- 64	-0.0171**	0.000414	-0.0312
	(0.00802)	(0.00922)	(0.0265)
p-value of test for equality across group	0.0002	0.1270	0.0308
	III. Education		
College graduates	0.00598	0.0161***	0.00241
	(0.00820)	(0.00614)	(0.0180)
No college degree	-0.0249***	-0.00836	-0.0226**
	(0.00851)	(0.0122)	(0.0101)
p-value of test for equality across group	0.0000	0.0005	0.0068

Notes: Coefficients are from a probit regression eq.(2). Marginal effects are reported. Rgression includes age, race, education, marital status, health stuatus, industry and occupation dummies, year dummies and state-specific time trend and pair-wise interaction terms and a triple-interaction term Robust standard errors are clustered on state. Test for equality across group reports whether the coefficient of Mass*ESI*Post for one groups is statistically sigificantly different from the other. The eligibility for subsidy is determined by family income. Individuals whose family income is between 150% of FPL and 300% are eligible for subsidized private health insurance on sliding scale and individuals with family income is lower than 100 % FPL are eligible for Medicaid and eligible for fully-subsidized health insurance if family income is between 100% of FPL and 150% FPL. I treat all individuals with family income under 300% of FPL are eligible for subsidy. Robust standard errors are in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$

Table 6: DDD estimates for group aged 60-64

	(1)	(2)	(3)
	Retired	Part-time	Self-employed
MA*Post	-0.0112***	-0.000115	-0.0212***
	(0.00253)	(0.00343)	(0.00696)
MA*AGE60-64*Post	-0.00538	0.0251**	-0.0382***
	(0.00444)	(0.0118)	(0.0145)
Observations	9,329	9,329	9,329

Notes: Coefficients are from a DDD estimation using probit regression on population aged from 60-69. Marginal effects are reported. Rgression includes age, race, education, marital status, health stuatus, industry and occupation dummies, year dummies and state-specific time trend and pair-wise interaction terms and a triple-interaction term. Robust standard errors are clustered on state. Treatment group is male residents of Massachusetts aged 60-64 and control group is male residents of Massachsetts aged 65-69 who are eligible for Medicare and barely affected health care reform in terms of health insurance coverage.