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Expansion
on Childless Adults: Early Effect.

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Impacts of Affordable Care Act 2014 Medicaid Expansion on Childless adults: Early Effect.

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Abstract

Since the Affordable Care Act was enacted and implemented in March 23, 2010 and in September 23, 2010, respectively, its impacts on insurance coverage and labor supply has been widely investigated. In this paper, I used Difference-in-Difference method and Difference-in-Difference-in-Difference method to analyze the unintended effects of Medicaid expansion on labor supply of treated group in the U.S. along with Affordable Care Act implementation. The treated group means people who become eligible for Medicaid after ACA 2014 expansion. I have analyzed the effects by dividing the population into two groups depending on dependent child existence status. In both “with child” and “without child(childless)” group, treated individuals reduced their labor supply significantly. The tendency of decrease in labor supply seems more evident in “with child” group than “childless group”. Yet, the difference between the two groups is not significantly different from each other.

Keywords: Affordable Care Act, Medicaid, Labor Supply, Childless Adults, Obama Care, Total Wage

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1 Introduction

In the United States most of people are insured by employer sponsored insurance. Hence, researches on proving the link between insurance and labor supply of individuals has been widely conducted. In this paper, I focused on Patient Protection and Affordable Care Act implementation, which has brought notable change in insurance coverage of people in the U.S., affected the labor supply of benefited people.

Patient Protection and Affordable Care Act(ACA) has been implemented for years since March 23, 2010. The implementation of ACA has been started from September 23, 2010. Since then, each year the ACA provisions seem to expand their coverage to achieve the Act's main goal of making every citizens in the U.S. have insurance. Interestingly some of the changes are related to young adults' insurance coverage eligibility. For example, from 2010 young adults who are under the age of 26 has allowed to be covered by their parent's employer sponsored health insurance plan(Depew 2013). Before the enactment ACA 2010 provision, young adults between the age of 18 and 26 were not covered by their parents' health insurance. Yet, with the change in dependent coverage mandate, young adults between the age of 18 and 26 can have their parent's expanded ESI coverage. This kind of alterations can be thought as affecting labor market behaviors of young adults since they do not have to participate in labor market to be covered by their own employer sponsored health insurance plan. As a result of the implementation, the young people has more incentive to deviate from labor supply to other activities such as education than before. This phenomenon is called "employment-lock", which is focused on the decision to work or not(Garthwaite, Gross, and Notowidigdo(2014), Daeho Kim(2016a) and etc.).

In 2014, one of the interesting provisions was implemented related to adults "with child" and "without" child. Before 2014 ACA alteration, many of adults who were without child were not eligible for medicaid application in most of the states in the U.S.. Only adults with children were

eligible for Medicaid application if their family(or household) income was under certain percentage(around 50%, it varies from one state to the other) of Federal Poverty Line(FPL). However, with the expansion of ACA coverage in 2014, adults who both do not have child and have child become eligible for the application of Medicaid if their family(or household) income is under 138% of FPL. This implies that there are two groups of people who has become eligible for Medicaid application. One group of people is adults who are with children and whose family(or household) income is between ‘before expansion level’ and 138% of FPL. The other group of people is ones who are without child and whose family(or household) income of under 138% of FPL. With this change of eligibility status, I think that both groups of benefited people will change their labor market behavior. People can reduce their labor supply as they do not have to work to be insured by employer based insurance anymore. Also, individuals can keep on working, but change their job that better fits them. This phenomenon is called “job-lock”, which means workers stay on one job due to certain reasons although the job does not fit their interest. This concept is focused on job-mobility(Gruber and Madrian(1993), Madrian(1994) and Daeho Kim(2016a)).

In this paper, I mainly focus on the effects of ACA 2014 implementation on the benefited individuals depending on their dependent child existence status. There were several researches conducted by taking in to account of the dependent child existence status. Daeho Kim(2016) conducted research on the impacts of ACA Medicaid expansion in Connecticut on the labor supply of childless adults. Garthwaite et al(2013) analyzed the effects of health care reform in Tennessee on the labor supply of childless adults. These researches did concentrate on clarifying the effects of the public health insurance policy change on the labor supply of childless adults, but they did not compare the results between childless group and with child group. Hence, in this paper, I will analyze the effects of the ACA Medicaid expansion on both with child group and childless group and compare the two groups. Noticeable expansion of ACA Medicaid coverage in 2014 allowed me

to conduct this study.

To analyze the effect of ACA 2014 change on treated adults, I used Difference-in-Difference method and Difference-in-Difference-in-Difference method to identify the mean-variance effect of the policy. Current Population Survey(CPS) March Supplement data dated from 2014 to 2015 was used for the analysis. The effects of the ACA 2014 change was studied by analyzing the change of labor supply and income of newly eligible individuals. There are four labor market indicators including labor market participation indicator, full-time labor force indicator, hours worked per week, and weeks worked per year. There are two income indicators used including person's total income and total wages and salaries.

The rest of the sections consists of as follows. In section 2, prior literatures are introduced. In section 3, general explanations for Patient Protection and Affordable Care Act are provided. In section 4, data description and summary statistics of each subgroup are presented. In section 5, model specification, estimation strategy and results of the estimation were suggested. In section 5.4 and 5.5, heterogeneity test and robustness check of the model were described, respective.

2 Literature Review

The relationship between health insurance and employment status has been investigated for years. As the implementation of the Affordable Care Act provides a quasi-experimental set up for the study of its labor market implication, several researches have been conducted with the start of ACA implementation.

The effects of ACA 2010 provision of expanding dependent insurance coverage on labor market outcome have been studied widely. Antwi et al(2013) examines the effects of extended parental health insurance coverage for young adults on their health insurance outcomes and on labor market behavior. They used SIPP data and Difference-in-Difference strategy for estimation. They found

decrease in uninsurance and reduction of work hours of young adults. Dephew(2013) estimates the effect of expanded dependent health insurance coverage on the labor supply of young adults. The author studies the effect of the ACA dependent coverage change on the labor market outcomes, education, and marital decisions of benefited young adults. In this paper, Difference-in-Difference and triple Difference methods are utilized. Dephew found that the policy reduces the labor supply of eligible young adults and females are more likely to be full-time students as result of the policy change. Daeho Kim(2016a) examines the effect of the Affordable Care Act expanded dependent coverage mandate on labor supply. Difference-in-Difference, regression discontinuity, and regression kink design are used for estimation. The results shows that the policy change affects insurance coverage of young adults, but did not have effect on the labor supply. Goda et al(2016) studied the incidence of mandated insurance health care by analyzing the ACA dependent care mandate. This paper does not directly conduct research on the labor market outcomes, but it is interesting paper in that it measures the costs and incidence of the dependent care mandata. Monheit et al(2011) examines the impact of state policies to expand dependent coverage on the health insurance coverage of young adults.

In addition to these papers, there are several papers focused on the effect of Medicaid expansion on the labor supply of childless adults. Daeho Kim(2016b) studies the effects of ACA early Medicaid expansion on labor supply in Connecticut. Difference-in-difference strategy is used for the estimation. He find that with the expansion of Medicaid coverage the insurance coverage for low-income childless adults has been increased substantially. The result also shows that the employment rate declined among those low-income childless adults. Garthwaite et al(2013) conducts research on the effect of health insurance on labor supply of childless adults with quasi-experimental set up of Tennessee's abrupt Medicaid disenrollment.

Other researches are as follows. Callison, Kevin, and Paul Sicilian(2016) examines the effect of

Affordable Care Act of Medicaid expansion on labor market outcomes in population subgroups by gender and race. Pohl(2014) studies the impact of ACA medicaid expansion on the labor supply of single mother. Dillender et al(2016) investigates the effects of the Affordable Care Act on Part-Time Employment using monthly CPS data. Their results show that the ACA affects differently depending on each individual's job characteristics. Courtemanche et al(2016) solely investigates the effects of ACA change in 2014 on health insurance coverage. Baiker et al(2014) conducts a research on Oregon health insurance experiment. In this paper, the impacts of Medicaid on labor supply is analyzed. Finkelstein et al.(2011) also analyzes the effects of Oregon health care reform on labor market outcomes. Levine et al(2011) assesses the impacts of policies such as SCHIP 1997 to increase insurance coverage for young adults.

By considering previously mentioned literature into account, I mainly concentrates on the effects of ACA 2014 medicaid expansion on the labor supply of individuals depending on their dependent child existence status. Many studies are done to verify the effects of health insurance expansion on labor market and some of them are focused on the childless adults. Yet, there are little researches that compare the effects of public health insurance policy change on labor supply between individuals with child and without child although it is possible that people have high incentive to behave differently depending on their dependent child existence status. Hence, in this study, I focuses on comparing the unintended labor market outcomes of Medicaid expansion in 2014.

3 Patient Protection and Affordable Care Act and Medicaid Expansion

In the United States, not every individual has health insurance. In fact, around 17% of people do not have their own health insurance. For this reason, in order to make every citizen in the U.S. has health insurance, president Obama suggested overall public health care reform, which is called Patient Protection and Affordable Care Act. This act was enacted in March 23, 2010 and started to be implemented in September 23, 2010. Henceforth, each year provisions of ACA have been taken effect step-by-step. In Table 1, the contents of each year's provision were provided.

In this paper, I would mainly concentrate on Medicaid expansion caused by ACA 2014 implementation. Medicaid is one of the public health care services offered by federal government and states for the people from the low-income group for free. Medicaid is run by each state and funded by federal government. As this policy is operated by each state, implementing Medicaid policy is each state government's own latitude. This means that some of the states in the U.S. do not actually provide medical service for the low income groups for free. Along with the ACA 2014 implementation, however, the Medicaid eligibility criteria become wider than before. People without child become eligible for Medicaid application if their family(or household) income is below 138% of FPL. Also, people with child whose income is below 138% of FPL become eligible for Medicaid application. With this change, huge amount of people could be eligible for the Medicaid. Table 2 shows change of income eligibility criteria in each state.

Table 1: Key Features of the Affordable Care Act by Year

	Features
2010	<p>New Consumer Protections</p> <ul style="list-style-type: none"> · Prohibiting denying coverage of children based on pre-existing conditions. · Putting information for consumers online. · Appealing insurance company decisions. · Eliminating lifetime limits on insurance coverage. · Regulating annual limits on insurance coverage. · Prohibiting insurance companies from rescinding coverage · Establishing consumer assistance programs in the States
	<p>Improving Quality and Lowering Costs</p> <ul style="list-style-type: none"> · Providing free preventive care. · Preventing disease and illness. · Offering relief for 4 million seniors who hit the medicare prescription drug "Donut Hole". · Cracking down on health care fraud. · Providing small business health insurance tax credits.
	<p>Increasing Access to Affordable Care</p> <ul style="list-style-type: none"> · Holding insurance companies accountable for unreasonable rate hikes. · Extending coverage for young adults. · Expanding coverage for early retirees. · Rebuilding the primary care workforce. · Strengthening community health centers. · Providing access to insurance for uninsured Americans with pre-existing conditions. · Allowing states to cover more people on medicaid. · Increasing payments for rural health care providers.
2011	<p>Improving Quality and Lowering Costs</p> <ul style="list-style-type: none"> · Improving care for seniors after they leave the hospital. · Offering prescription drug discounts. · Providing free preventive care for seniors. · Improving health care quality and efficiency. · Introducing new innovations to bring down costs.
	<p>Increasing Access to Affordable Care</p> <ul style="list-style-type: none"> · Increasing access to services at home and in the community.
	<p>Holding insurance companies accountable</p> <ul style="list-style-type: none"> · Bringing down health care premium. · Addressing overpayments to big insurance companies and strengthening medicare advantage.
2012	<p>Improving Quality and Lowering Costs</p> <ul style="list-style-type: none"> · Linking payment to quality outcomes. · Encouraging integrated health systems. · Reducing paperwork and administrative costs. · Understanding and fighting health disparities.
	<p>Increasing Access to Affordable Care</p> <ul style="list-style-type: none"> · Providing new, voluntary options for long-term care insurance.
2013	<p>Improving Quality and Lowering Costs</p> <ul style="list-style-type: none"> · Improving preventive health coverage. · Expanding authority to bundle payments.
	<p>Increasing Access to Affordable Care</p> <ul style="list-style-type: none"> · Increasing medicaid payments for primary care doctors. · Open enrollment in the health insurance marketplace begins.
2014	<p>New Consumer Protections</p> <ul style="list-style-type: none"> · Prohibiting discrimination due to pre-existing conditions or gender. · Eliminating annual limits on insurance coverage. · Ensuring coverage for individuals participating in clinical trials.
	<p>Improving Quality and Lowering Costs</p> <ul style="list-style-type: none"> · Making care more affordable. · Establishing the health insurance marketplace. · Increasing the small business tax credit.
	<p>Increasing Access to Affordable Care</p> <ul style="list-style-type: none"> · Increasing access to medicaid. · Promoting individual responsibility.

*<http://www.hhs.gov/healthcare/facts-and-features/key-features-of-aca-by-year/index.html>

Table 2: : Medicaid Adult Income Eligibility Limits as a Percent of Federal Poverty Level Jan. 2013 and Jan. 2014 and Medicaid Expansion Adoption Status in Each States

State	Parents of Dependent Children			Other Adults(Non-Disabled)			Adoption(Yes) /No Adoption(NO)
	January 2013		January 2014	January 2013		January 2014	
	Jobless	Working		Jobless	Working		
Arizona	100%	106%	138%	100%	100%	138%	Yes
Arkansas	13%	16%	138%	-	-	138%	Yes
California	100%	106%	138%	-	-	138%	Yes
Colorado	100%	106%	138%	10%	20%	138%	Yes
Connecticut	185%	191%	201%	55%	70%	138%	Yes
Delaware	100%	120%	138%	100%	110%	138%	Yes
District of Columbia	200%	206%	220%	200%	211%	215%	Yes
Hawaii	133%	133%	138%	133%	133%	138%	Yes
Illinois	133%	139%	138%	-	-	138%	Yes
Iowa	27%	80%	138%	-	-	138%	Yes
Kentucky	33%	57%	138%	-	-	138%	Yes
Maryland	116%	122%	138%	-	-	138%	Yes
Massachusetts	133%	133%	138%	-	-	138%	Yes
Minnesota	215%	215%	205%	75%	75%	205%	Yes
Nevada	24%	84%	138%	-	-	138%	Yes
New Jersey	200%	200%	138%	-	-	138%	Yes
New Mexico	28%	85%	138%	-	-	138%	Yes
New York	150%	150%	138%	100%	100%	138%	Yes
North Dakota	33%	57%	138%	-	-	138%	Yes
Ohio	90%	96%	138%	-	-	138%	Yes
Oregon	30%	39%	138%	-	-	138%	Yes
Rhode Island	175%	181%	138%	-	-	138%	Yes
Vermont	185%	191%	138%	150%	160%	138%	Yes
Washington	35%	71%	138%	-	-	138%	Yes
West Virginia	16%	31%	138%	-	-	138%	Yes
Total							Yes: 25 ,No: 26

*Source: Eligibility data for January 2013 based on the results of a national survey conducted by the Kaiser Commission on Medicaid and the Uninsured and the Georgetown University Center for Children and Families, 2013. Status of Medicaid expansion decisions and 2014eligibility levels based on data from the Centers for Medicare and Medicaid Services, available at: <http://medicaid.gov/Affordable-CareAct/Medicaid-Moving-Forward-20-14/Medicaid-and-CHIP-Eligibility-Levels/medicaid-chip-eligibility-levels.html>, and this table above is modified , version of table available at: <http://kff.org/medicaid/fact-sheet/medicaid-eligibility-for-adults-as-of-january-1-2014/>

3.1 Link Between Labor Supply and Health Insurance

It is not straight forward to come up with the link between labor supply and health insurance without knowing background information about the U.S. insurance market. In the U.S., around 70% of population has employer sponsored health insurance. This means that most of the U.S. citizen get covered by insurance by supplying their labor in the labor market. This implies that the relation between health insurance and employment status will not be simple. To be specific, we can think of three types of people. The first type is a person who works more time than the eligible time to get covered by employer sponsored health insurance. This person will work as he used to do regardless of the Medicaid expansion. The second type of person is one who does not work enough time to be covered by employer sponsored health insurance. This person may end up getting low income, which would increase the possibility of getting Medicaid coverage. The last type is a person who only works the exact amount of eligible hours to be covered by employer sponsored health insurance. This person seems to value health insurance positively, but does not want to work more than eligible hours for ESI. This means that she has high incentive of deviating to the other work or no work when her insurance is provided by external sources not related to her employment status(Depew 2013). As mentioned in “1.Introduction”, these phenomena can be thought as “employment-lock” or “Job-lock”.

In this paper, I divide people into two groups. One group consists of people with child. The other is comprised of individuals without child. The reason for this separation is because we can expect different behavior depending on the dependent child existence status. People with child have incentive to keep their labor supply level regardless of Medicaid expansion since they feel more burdened due to their dependent child. They need to prepare not only just for their future but also for their child’s future. In addition to this, we cannot ignore job-lock in this case. It is possible that individuals with child are currently working on their job due to the insurance even

if their job does not fit their interests. In this case, it is possible that people just change their job and keep on working the same amount of time as before. Yet, there also exists incentive to reduce working hours or labor supply for the people with child. If individuals such as women value spending time with their child highly, they may reduce their labor supply.

For the childless group, people in the group also have incentives for reducing or keeping their labor supply. Childless adults are more likely to deviate to the other jobs or quit the job that they have if they do not need to work to be covered by employer sponsored insurance. This is because they are less burdened than the people with child. The childless adults only need to prepare for their future. However, in this case we cannot ignore the phenomenon called ‘job-lock’. As explained in the previous paragraph, same thing can happen for the people without child. Regarding all the possibilities of reducing and keeping labor supply, it is not clear for which direction the policy effect will happen. Thus, I want to clarify the direction by conducting research in this paper.

4 Data

For the analysis Current Population Survey Annual Social and Economics(ASEC) March Supplement(CPS) data is utilized. Basically, CPS data is collected and released every month. The datasets that are released every month only includes basic demographic information and labor market participation and outcomes of surveyed individuals. However, CPS March Supplement provides much more information than usual CPS data. It includes a variety of demographic information including insurance status and number of dependent children. Also, it provides detailed information about labor market participation and outcomes. For these reasons, I used CPS March Supplement for the research.

The data is collected by the Bureau of the Census for the Bureau of Labor Statistics and it has interesting survey structure, which is called “Outgoing Rotation Group”. Once each individual enter into the survey, they are asked to answer for four consecutive months. Since then, they are never asked for eight months. After eight months of break, each individual is asked to participate in the survey for four consecutive months and they exit from the survey. For the study, I used 2014 and 2015 CPS datasets in order to study the effects of ACA 2014 expansion. This is because basically CPS data survey collects information of previous year of each person. Hence, to analyze the policy effect between 2013 and 2014 I need CPS 2014 and 2015 datasets. For the analysis I sort out people depending on their dependent child existence status and Medicaid benefit status. As a result, information of 1,100 childless individual and 1,018 individual with child was exploited for the study.

Table 2 shows summary statistics of people. In “with child” group, personal characteristics such as age and education seem to be homogeneous between treatment and control group. In “without child(childless)” group, personal characteristics seem to be homogeneous across the two groups except for the race and education.

Table 3: Summary Statistics

			2013	2014					2013	2014	
			mean	mean	Diff.				mean	mean	Diff.
With Child	Age	treat	36.889	37.901		No Child	Age	treat	43.997	45.110	
		control	34.57	35.563				control	45.229	46.725	
	High School grad.	treat	0.534	0.506			High School grad.	treat	0.566	0.556	
		control	0.590	0.609				control	0.575	0.566	
	College grad	treat	0.122	0.118			College grad.	treat	0.137	0.130	
		control	0.036	0.038				control	0.070	0.066	
	White	treat	0.817	0.817			White	treat	0.710	0.710	
		control	0.707	0.709				control	0.45	0.433	
	Person Income	treat	7.847	7.691	-0.156		Person Income	treat	7.944	7.845	-0.099
		control	7.253	7.238	-0.015			control	6.742	7.025	0.283
	Wages & Salaries	treat	6.625	5.963	-0.662		Wages & Salaries	treat	5.696	5.068	-0.628
		control	4.585	4.905	0.32			control	2.305	2.365	0.060
	LFP	treat	0.628	0.580	-0.048		LFP	treat	0.512	0.461	-0.051
		control	0.405	0.476	0.071			control	0.200	0.245	0.045
	Full Time	treat	0.489	0.439	-0.05		Full Time	treat	0.391	0.340	-0.051
		control	0.278	0.321	0.043			control	0.104	0.150	0.046
	Part Time	treat	0.156	0.160	0.004		Part Time	treat	0.139	0.136	-0.003
		control	0.148	0.173	0.025			control	0.104	0.100	-0.004
	Work Hours	treat	26.913	23.811	-3.102		Work Hours	treat	22.480	20.136	-2.344
		control	17.975	18.878	0.903			control	8.258	8.883	0.625
	Work Weeks	treat	32.590	29.773	-2.819		Work Weeks	treat	27.373	24.390	-2.983
		control	21.061	22.971	1.91			control	9.825	11.400	1.575
	Obs.		1,018				Obs.		1,100		

5 Model Specification

5.1 Difference-in-Difference

For the estimation of the effects of ACA 2014 policy, Difference-in-Difference(DID) method is exploited. In order to use this strategy, I need treatment group. In this section, I want to analyze the effects of the policy change within two subgroups. One group consists of people with child and the other group consist of individuals without child. In the with child group, there are people whose family(or household income) is below ‘before ACA expansion level’. For them, ACA 2014 alteration might make trivial change in their Medicaid eligibility as expanded income eligibility level of Medicaid coverage includes the ‘before ACA expansion level’. For this reason, I used them as a control group for the analysis of with child group. Specifically, in the with child group, people who received Medicaid both in 2013 and in 2014 become ‘control group’. With the ACA 2014 change the income eligibility for Medicaid has been changed. People with household income below 138% of FPL could apply for the Medicaid. This means that there may be people who could not receive Medicaid in 2013, but could receive Medicaid in 2014. For them, there happens change in their health insurance status. Thus, I choose these peoples as a treatment group for the analysis of with child group.

When estimating the effects of ACA 2014 alteration on childless adults, I also used DID strategy. Initially, childless adults are not eligible for Medicaid application. Yet, with the policy change childless individuals have acquired the eligibility for Medicaid application. If the household income of them is below 138% of FPL, they could apply for the Medicaid. With this background knowledge I choose people who received Medicaid in 2014, but not in 2013 as a treatment group. As a control group, I choose childless adults who were already receiving Medicaid in 2013 and are still receiving in 2014. This formation of control group is possible since some states already provided

Medicaid with childless adults before the ACA Medicaid expansion in 2014. Specified model for the estimation is as follows:

$$Y_{it} = \alpha_1 + \alpha_2 T_t + \alpha_3 Treat_i + \alpha_4 T_t Treat_i + \alpha_5 X_{it} + \epsilon_{it}$$

, where i indicates each individual, m is Medicaid receive status, t means year, Y_{it} can be labor supply indicators and income indicators, T_t is time indicator, which has the value of 1 if it is year 2014 and 0 otherwise, $Treat_i$ is a indicator for treatment status, which has the value of 1 if an individual is included in treatment group and 0 if one is in the control group. X_{it} is personal characteristics such as age and gender. α_4 is the main parameter of interest of the estimation. ϵ_{it} is error term. Table 4 specifies the variables included in the estimation model.

Table 4: Included Variables

	variables
Y_{it}	labor force participation, full-time employment, part-time employment, usual hours worked per week, weeks worked per year, total person income, total wage and salaries
X_{it}	age, gender, race, marital status, education, unemployment duration, spouse's income

5.2 Difference-in-Difference-in-Difference

For the comparison between with child group and without child group, I utilized Difference-in-Difference-in-Difference(DDD) methods. In this part, my main interest is to find out whether there exists meaningful difference in labor supply and income change between the two groups. Model specification is as follows:

$$Y_{it} = \beta_1 + \beta_2 T_t + \beta_3 Treat_i + \beta_4 C_i + \beta_5 T_t * Treat_i + \beta_6 T_t * C_i$$

$$+\beta_7 Treat_i * C_i + \beta_8 * T_t * Treat_i C_i + \beta_3 9 X_{it} + \epsilon_{it}$$

, where C_i is 1 if an individual has at least one dependent child. All the variables are defined the same as in the Difference-in-Difference(DDD) model of the previous section. β_8 is main parameter of interest that captures DDD effects.

5.3 Results

Table 5 shows estimation results of labor supply effects of ACA Medicaid expansion in 2014 on ‘with child’ group. Labor force participation(LFP), full-time labor force participation (Full-Time LF), part-time labor force participation(Part-Time LF), usual hours worked per week (Uhr-week), and weeks worked per year(Weeks Worked) are used as indicators for labor supply. Labor force participation(LFP), full-time labor force participation(Full-Time LF), part-time labor force participation(Part-Time LF) coded 1 if a person is working and 0 otherwise. Total person income(Person Income) and total wages and salaries(Total Wages) are income indicators. For the income indicators, to adjust for the units log person income and log wage are used for the estimation. I used income indicators as a dependent variable as labor supply and total wages are closely related to each other. By analyzing this variable, I can analyze the effects of the policy change on total wages of people.

The estimation results shows that labor force participation of adults with child decreased significantly by around 10.3% after the ACA Medicaid expansion in 2014. Full-time labor force participation reduced significantly by 7.9%. People with child work 3 hours less per week and work

4 weeks less per year than before the policy change. This results shows that with the ACA Medicaid expansion in 2014 the benefited adults with child have decreased their labor supply substantially. Also, total wage of the benefited adults has decreased by 85%. With this result we can possibly infer that people with child may value more on spending time with their children. However, since the data used in this paper is short and only includes initial year of the policy implementation, it is premature to assure that people value more on their free time or spending time with children. As there can exist adjustment period for the policy change, further researches need to be done with more period of data after the expansion in order to clarify the effects of the ACA 2014 change. One thing that we can clearly say, however, is that people with child have reduced their labor supply with the implementation of Medicaid expansion in 2014.

Table 6 shows the results of estimation of the childless group. All the variables are same as explained in the previous paragraph. Labor force participation has decreased 8.5% and full-time labor force participation has reduced 8.6%. Usual hours worked per week has declined around 2~3 hours although the result is not significant. Weeks worked per year has decreased 4 weeks. Total wage decreased around 62%, but it is not significant. In the case of childless adults, signs of DD estimates are very similar to that of with chld group, but the amount is smaller and significance is lower than that of with child adults. This result shows that the initial effects of ACA medicaid policy change make more change in the with child group although the direction of the change in labor supply and total wage were the same in both groups.

To examine the effects of the public health insurance policy change is significantly different, DDD estimation was conducted and the results are shown in Table 7. In the regression, childless adults were coded 1 and adults with child were coded as 0. By interpreting the estimate, we can know that the difference was somewhat larger in with child group. Labor force participation has decreased by 2 percentage point more and full time labor force participation has declined by 0.5

percentage point more in with child group. Usual hours worked per week and weeks worked per week seems to show little difference between the two groups. Total wage reduced 25 percentage point more in the with child group. Yet, these results are not significant according to the estimation results.

Table 5: With Child Labor Supply and Income

	LFP	Full-Time LF	Part-Time LF	Uhrsweek [†]	Weeks Worked	Person Income	Total Wages
DD	-0.103**	-0.079*	-0.017	-3.539**	-4.117**	-0.063	-0.854**
	(0.041)	(0.039)	(0.032)	(1.607)	(1.997)	(0.343)	(0.412)
Time	0.047*	0.022	0.020	0.351	1.042	-0.159	0.182
	(0.029)	(0.027)	(0.022)	(1.127)	(1.400)	(0.240)	(0.289)
Treatment	0.178***	0.153***	0.021	7.059***	9.438***	0.365	1.648***
	(0.029)	(0.028)	(0.023)	(1.160)	(1.442)	(0.247)	(0.297)
Demographics							
Age	0.000	0.002**	-0.001*	-0.016	0.035	0.038***	-0.020*
	(0.001)	(0.001)	(0.000)	(0.043)	(0.053)	(0.009)	(0.011)
Sex	0.198***	0.238***	-0.046***	10.829***	10.158***	1.967***	1.886***
	(0.023)	(0.021)	(0.017)	(0.891)	(1.107)	(0.190)	(0.228)
Race	-0.003	0.012	-0.021	0.279	-0.007	-0.311	-0.049
	(0.024)	(0.023)	(0.019)	(0.960)	(1.193)	(0.205)	(0.246)
Marital Status	0.056*	0.141***	-0.070***	3.457***	4.860***	-0.589**	0.569*
	(0.030)	(0.028)	(0.023)	(1.172)	(1.457)	(0.250)	(0.300)
Education	0.060***	0.062**	-0.001	2.758***	2.758***	0.733***	0.760***
	(0.011)	(0.010)	(0.008)	(0.432)	(0.537)	(0.092)	(0.110)
Unemployment Duration	-0.007***	-0.005***	-0.002***	-0.162***	-0.276***	-0.030**	-0.045***
	(0.000)	(0.000)	(0.000)	(0.030)	(0.038)	(0.006)	(0.007)
Spouse's Income	-0.010***	-0.015***	0.003	-0.466***	-0.673***	-0.087***	-0.075***
	(0.002)	(0.002)	(0.002)	(0.113)	(0.141)	(0.024)	(0.029)
Obs.	1,018	1,018	1,018	1,018	1,018	1,018	1,018

* Note that Uhrsweek means Usual Hours Worked per week., () is standard error., *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

Table 6: Childless Labor Supply and Income

	LFP	Full-Time LF	Part-Time LF	Uhrsweek ⁺	Weeks Worked	Person Income	Total Wages
DD	-0.085*	-0.086*	0.002	-2.707	-4.116*	-0.274	-0.621
	(0.047)	(0.045)	(0.034)	(1.910)	(2.337)	(0.392)	(0.477)
Time	0.045	0.041	-0.000	0.694	1.580	0.182	0.095
	(0.041)	(0.040)	(0.030)	(1.689)	(2.067)	(0.347)	(0.421)
Treatment	0.248*** ⁴	0.226***	0.033	11.147***	14.435***	0.816***	2.691***
	(0.034)	(0.032)	(0.024)	(1.383)	(1.692)	(0.284)	(0.345)
Demographics							
Age	-0.006***	-0.002***	-0.003***	-0.177***	-0.242***	0.031***	-0.058***
	(0.000)	(0.000)	(0.000)	(0.029)	(0.036)	(0.006)	(0.007)
Sex	0.016	0.053***	-0.034**	2.485***	0.952	0.641***	0.305
	(0.019)	(0.018)	(0.014)	(0.799)	(0.978)	(0.164)	(0.199)
Race	0.062***	0.072***	-0.011	4.345^[* **]	3.986***	0.739***	0.758***
	(0.021)	(0.020)	(0.015)	(0.862)	(1.054)	(0.177)	(0.215)
Marital Status	0.097***	0.135***	-0.048**	4.342***	5.079***	-0.183	0.960***
	(0.028)	(0.027)	(0.020)	(1.142)	(0.234)	(0.362)	(0.285)
Education	0.067***	0.061***	0.005	2.972***	2.727***	0.664***	0.724***
	(0.009)	(0.008)	(0.006)	(0.379)	(0.463)	(0.077)	(0.094)
Unemployment Duration	-0.006***	-0.004***	-0.002***	-0.141***	-0.263***	-0.049***	-0.037**
	(0.000)	(0.000)	(0.000)	(0.025)	(0.030)	(0.005)	(0.006)
Spouse's Income	-0.002	-0.006**	0.005**	-0.073	-0.124	-0.014	0.010
	(0.003)	(0.003)	(0.002)	(0.136)	(0.166)	(0.028)	(0.034)
Obs.	1,100	1,100	1,100	1,100	1,100	1,100	1,100

* Note that Uhrsweek means Usual Hours Worked per week., () is standard error., *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

Table 7: DDD: Labor Supply and Income

	LFP	Full-Time LF	Part-Time LF	Uhrsweek [†]	Weeks Worked	Person Income	Total Wages
DDD	0.020 (0.063)	-0.005 (0.060)	0.020 (0.047)	0.907 (2.513)	0.086 (3.096)	-0.230 (0.525)	0.256 (0.633)
Time	0.053* (0.028)	0.026 (0.027)	0.022 (0.021)	0.462 (1.146)	1.225 (1.412)	-0.187 (0.239)	0.216 (0.289)
Treatment	0.180*** (0.029)	0.157** (0.028)	0.019 (0.021)	6.928*** (1.170)	9.477*** (1.441)	0.254 (0.244)	1.621*** (0.294)
Child Status	-0.168*** (0.037)	-0.163*** (0.036)	-0.019 (0.028)	-8.376*** (1.97)	-9.472*** (1.844)	-1.255*** (0.312)	-1.767*** (0.377)
Treatment*Time	-0.103*** (0.041)	-0.079** (0.039)	-0.017 (0.030)	-3.538** (1.638)	-4.105** (2.018)	-0.043 (0.342)	-0.858** (0.412)
Time*Child Status	-0.012 (0.051)	0.011 (0.049)	-0.024 (0.038)	0.067 (2.038)	0.123 (2.511)	0.357 (0.426)	-0.158 (0.513)
Treatment*Child Status	0.081* (0.045)	0.076* (0.043)	0.019 (0.033)	4.831*** (1.783)	5.564** (2.197)	0.731** (0.372)	1.203*** (0.449)
Demographics							
Age	-0.003*** (0.000)	-0.000 (0.000)	-0.002*** (0.000)	-0.113*** (0.024)	-0.141*** (0.030)	0.037*** (0.005)	-0.043*** (0.006)
Sex	0.101*** (0.014)	0.140*** (0.014)	-0.039*** (0.011)	6.247*** (0.590)	5.242*** (0.727)	1.189*** (0.123)	1.006*** (0.148)
Race	0.039** (0.016)	0.051*** (0.015)	-0.014 (0.012)	2.796*** (0.642)	2.526*** (0.791)	0.287** (0.134)	0.448** (0.161)
Marital Status	0.099*** (0.020)	0.160*** (0.019)	-0.059*** (0.015)	4.865*** (0.811)	6.065*** (0.999)	-0.236 (0.169)	0.959*** (0.204)
Education	0.0636*** (0.007)	0.063*** (0.006)	0.003 (0.005)	2.952*** (0.286)	2.839*** (0.353)	0.699*** (0.059)	0.755*** (0.072)
Unemployment Duration	-0.007*** (0.000)	-0.005*** (0.000)	-0.002*** (0.000)	-0.145*** (0.019)	-0.263*** (0.024)	-0.041*** (0.004)	-0.039*** (0.004)
Spouse's Income	-0.0108*** (0.002)	-0.012*** (0.002)	-0.002** (0.000)	-0.358** (0.087)	-0.503*** (0.107)	-0.067*** (0.018)	-0.051** (0.022)
Obs.	2,118	2,118	2,118	2,118	2,118	2,118	2,118

* Note that Uhrsweek means Usual Hours Worked per week., () is standard error., *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

5.4 Heterogeneity Tests

It is possible that the policy impact varies across population subgroups. If the effects differ from one subgroup to another, we can find the policy implication that the policy makers need to modify their policy depending on specific population subgroups when they design a specific plan. In this section, I divide each childless and with child group into subgroups depending on their gender, race and marital status so as to see if the effects of ACA 2014 Medicaid expansion differ across the population subgroups. These three characteristics are obvious features that we can use to make distinction of population subgroups.

Table 8 shows the results of estimation by gender, race, and marital status subgroups. Within the with child group, female shows 12.3% labor force participation reduction and 9.6% full-time labor force participation reduction. On the other hand, male shows significant reduction in work hours and work weeks. This implies that regardless of gender people with child reduces their labor supply. Yet, male tends to reduce amount of labor supply, but female is more likely to stop supplying labor when Medicaid coverage is expanded. Adults with child seem to reduce their labor supply regardless of their race, but the significance is more evident in white people with child. Married individual with child tends to reduce their labor supply much more compared to single adults with child.

In the childless group, male tends to reduce labor supply more than females, but the results were not statistically significant except for the weeks worked per year. Non-white childless adults seem to decrease labor supply much more than white childless adults, yet the results are not significant aside from weeks worked per year. Lastly, childless single adults seem to reduce their labor force participation and full-time labor force participation significantly more than married childless adults. Hours worked per week also have been declined significantly in this group. This proves that childless adults are less burdened, thus has more incentive to stop supplying labor or deviate to the other

activities such as education other than working when they are given health insurance that is not related to their labor supply.

Table 8: DD and DDD Labor Supply and Income: Gender, Race, Marital Status

			LFP	Full-Time LF	Part-Time LF	Uhrsweek ⁺	Weeks Worked	Person Income	Total Wages	
With Child	Gender	DD	Male	-0.070 (0.063)	-0.053 (0.065)	-0.034 (0.046)	-4.463* (2.606)	-5.4546* (2.998)	-0.272 (0.484)	-1.082* (0.658)
			Female	-0.123** (0.053)	-0.096** (0.048)	-0.010 (0.043)	-3.128 (1.989)	-3.336 (2.583)	0.040 (0.449)	-0.702 (0.516)
	Race	DD	White	-0.084* (0.047)	-0.088* (0.045)	0.005 (0.036)	-3.507* (1.824)	-3.785* (2.277)	-0.102 (0.400)	-0.606 (0.471)
			Non White	-0.180** (0.088)	-0.050 (0.082)	-0.096 (0.070)	-3.003 (3.452)	-4.554 (4.272)	0.090 (0.674)	-1.316 (0.871)
	Marital Status	DD	Married	-0.100* (0.053)	-0.054 (0.051)	-0.041 (0.039)	-4.439** (2.077)	-5.239** (02.565)	-0.567 (0.457)	-1.195** (0.537)
			Single	-0.087 (0.066)	-0.108* (0.061)	0.017 (0.055)	-2.950 (2.525)	-2.489 (3.179)	0.626 (0.504)	-0.375 (0.642)
Childless	Gender	DD	Male	-0.103 (0.067)	-0.095 (0.065)	-0.16 (0.047)	-1.898 (2.818)	-5.687* (3.308)	-0.686 (0.548)	-0.606 (0.689)
			Female	-0.071 (0.065)	-0.082 (0.061)	0.021 (0.049)	-3.611 (2.528)	-2.809 (3.257)	0.071 (0.549)	-0.654 (0.649)
	Race	DD	White	-0.073 (0.069)	-0.107 (0.067)	0.028 (0.049)	-0.640 (2.843)	-2.952 (3.428)	-0.484 (0.545)	-0.052 (0.702)
			Non White	-0.097 (0.067)	-0.050 (0.061)	-0.036 (0.049)	-3.976 (2.627)	-5.576* (3.321)	-0.029 (0.609)	-1.217* (0.672)
	Marital Status	DD	Married	-0.068 (0.094)	-0.074 (0.093)	-0.005 (0.061)	-0.122 (3.823)	-3.879 (4.645)	-0.171 (0.767)	-0.310 (0.971)
			Single	-0.098* (0.054)	-0.092* (0.051)	0.001 (0.041)	-3.680* (2.193)	-4.287 (2.703)	-0.241 (0.453)	-0.769 (0.543)
Both	Gender	DDD	Male	-0.034 (0.093)	-0.040 (0.093)	-0.014 (0.066)	2.446 (3.868)	-0.269 (4.506)	-0.421 (0.738)	0.465 (0.955)
			Female	0.052 (0.084)	0.011 (0.078)	0.033 (0.066)	-0.476 (3.219)	0.503 (4.169)	-0.015 (0.716)	0.064 (0.831)
	Race	DDD	White	0.009 (0.084)	-0.018 (0.081)	0.021 (0.062)	2.797 (3.357)	0.713 (4.119)	-0.419 (0.688)	0.546 (0.846)
			Non White	0.087 (0.110)	0.005 (0.102)	0.060 (0.083)	-0.864 (4.335)	-0.853 (5.413)	-0.148 (0.936)	0.132 (1.097)
	Marital Status	DDD	Married	0.033 (0.108)	-0.019 (0.105)	0.036 (0.076)	4.292 (4.286)	1.340 (5.262)	0.362 (0.911)	0.880 (1.097)
			Single	-0.006 (0.085)	0.020 (0.079)	-0.016 (0.067)	-0.444 (3.352)	-1.570 (4.166)	-0.868 (0.684)	-0.340 (0.838)

* Note that Uhrsweek means Usual Hours Worked per week. () is standard error. *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

5.5 Robustness Checks

In order to examine the robustness of the estimated model, several other equations are estimated. The estimation results are attached on the Appendix B. For the sensitivity check, I included variables that could possibly influence the results of the regression as a control variable. I included years of work, unemployment rate by state and number of children under the age of 6. These three variables can affect the labor supply decision of individuals. It is straight forward to consider years of work and unemployment rate may affect the labor supply decision of people. Yet, in case of the number of children under the age of 6 also can affect the labor supply decision of people. The younger a child is, the more efforts and time are required to take care of them. Thus, we can assume that the existence of child under the age of 6 may have influence on the labor supply decision of some individuals such as female. By comparing the tables on the Appendix B and table 5,6,7, we can see that there is trivial change in the values of DD and DD estimates before and after the inclusion of the variables stated in the previous paragraph. This means that the specified model in the paper can be justified as robust.

5.6 Hypothesis test

In this section, I do hypothesis test in order to compare the effects of the policy change distributionally. This is because in the DDD results, we obtained the estimation results of no significant difference between the two groups. DDD methods just suggests mean effect of the policy. Yet, it is possible that the effects of policy change can be different across each individuals. Thus, to make sure if the impacts of the policy is distinct in one group or not I conducted hypothesis of distributional stochastic dominance tests. For the test, used test statistic developed in Linton et al(2005). In Linton et al(2005) hypothesis test is conducted by using residuals obtained from regression result. This method is useful when there is many control variables. The main hypothesis

of interest is as follows:

$$H_0 : d_s^* \leq 0 \quad v.s. \quad H_q : d_s^* > 0$$

,where $d_s^* = \sup_{x \in X}(D_{kl}^{(s)})$ and $D_k^{(s)}(x, \theta) = \int_{-\infty}^x D_k^{(s-1)}(t, \theta) dt$, $D_{kl}^{(s)}(x) = D_k^{(s)}(x) - D_l^{(s)}(x) = D_{withchild}^{(s)}(x) - D_{nochild}^{(s)}(x)$.

In the test I tested the hypothesis of stochastic dominance of the distribution of with child group over childless group. To obtain residuals for the hypothesis test, the model suggested below is used.

$$Y_{it} = \alpha_1 + \underbrace{\alpha_2 T_t + \alpha_3 Treat_i + \alpha_4 D_{it} + \alpha_5 X_{it}}_{=Z_{itk}\theta_{k0}} + \epsilon_{it}$$

(Residual) = $Y_{itk} - Z_{itk}\theta_{k0} = \alpha_{1k} + \epsilon_{itk}$, where $k = \{with\ child, without\ child\}$.

Figure 1 shows distributions(CDFs) drawn from the residuals of the specified model above. Figure 2 shows graphs of integrated CDFs. Straight line is distribution of residuals of with child groups' estimation. Dotted line is distribution of the residuals of childless groups' estimation results. Distributions of residuals of weeks worked per year, total person income, and total wages and salaries are suggested consecutively. As suggested in the Figure 1 and Figure 2, we cannot distinguish whether one distribution dominates the other. In the Table 9, first order stochastic dominance(FSD) test results and the second order stochastic dominance(SSD) test results are suggested. The FSD test results do not support that one distribution stochastically dominates the other. This implies that the effects of the ACA 2014 policy change is not distributionally different between the childless and with child group across each individual. However, SSD test results

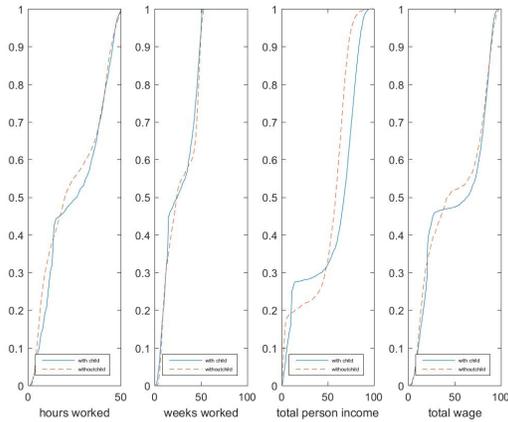


Figure 1: CDF's of With child and Childless

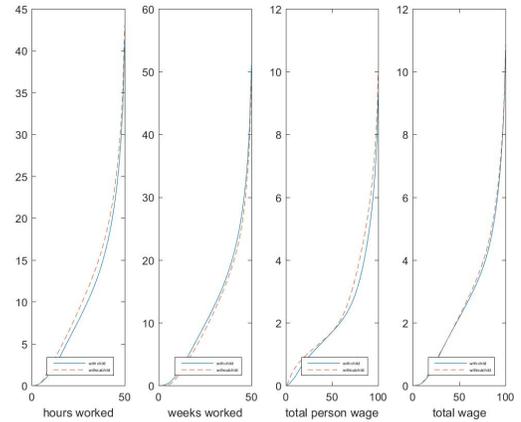


Figure 2: SDF's of With child and Childless

shows stochastic dominance of with child group over childless group in total person income and total wages.

Table 9: With Child and Childless Hypothesis Test

	Both $H_0 : d_s^* \leq 0$		Both $H_0 : d_s^* > 0$	
	recentered bootstrap		recentered bootstrap	
	FSD	SSD	FSD	SSD
Hours Worked	0.000	0.028	0.000	0.000
Weeks Worked	0.000	0.000	0.037	0.050
Person Income	0.000	0.990	0.000	0.000
Total Wage	0.000	0.395	0.000	0.015

6 Conclusions

In this paper, I estimated the effects of Affordable Care Act Medicaid expansion in 2014 on labor supply and total wage of adults with child and without child. I used Difference-in-Difference method and Difference-in-Difference method as a estimation strategy. The results show that in

both with child and childless group the labor supply and total wage decrease substantially. The significance and amount of the effects are larger in the with child group. Yet, the differences between the two groups are not meaningful. Moreover, the estimation is conducted by dividing people into subgroups depending on gender, race and marital status. This results show that in the with child group female, white, married groups show meaningful decrease in their labor supply. For the childless group, non-white and single subgroup show meaningful decline in their labor supply.

Overall the estimation results tell us that labor supply of benefited people has dwindled regardless of their dependent child existence status. This implies that with the implementation of ACA Medicaid expansion in 2014 working age population reduces their labor force. This can have negative effect on the U.S. economy. This is because people who might supply their labor if there is no free Medicaid exit from the labor market when they can get free health insurance. However, it is premature to say that ACA Medicaid expansion has negative effects on the labor market based on this research since this research has limitation on its data. Also, if individuals who stop supplying labor start to invest to develop their human capital by going to school, the policy change can have long-term positive effect on the U.S. economy (Depew, 2013).

The last thing that I want to point out is that the Medicaid policy need to be modified slightly when it is implemented. This is because some population subgroup react sensitively and the other subgroup show trivial reaction as the result in the heterogeneity test shows. Hence, to make the policy more effective policy makers need to consider heterogeneity of benefited people when they design and implement the policy.

7 Reference

- Antwi, Yaa Akosa, Asako S. Moriya, and Kosali Simon. "Effects of federal policy to insure young adults: evidence from the 2010 Affordable Care Act's dependent-coverage mandate." *American Economic Journal: Economic Policy* 5.4 (2013): 1-28.
- Baicker, Katherine, et al. "The impact of Medicaid on labor market activity and program participation: evidence from the Oregon Health Insurance Experiment." *The American economic review* 104.5 (2014): 322-328.
- Callison, Kevin, and Paul Sicilian. "Economic Freedom and the Affordable Care Act Medicaid Expansions and Labor Mobility by Race and Ethnicity." *Public Finance Review* (2016): 1091142116668254.
- Courtemanche, Charles, et al. *Impacts of the Affordable Care Act on Health Insurance Coverage in Medicaid Expansion and Non-Expansion States*. No. w22182. National Bureau of Economic Research, 2016.
- Depew, Briggs. "Expanded dependent health insurance coverage and the labor supply of young adults: Outcomes from state policies and the Affordable Care Act." *Job Market Paper*, Tucson, AZ: University of Arizona (2013).
- Dillender, Marcus, Carolyn Heinrich, and Susan N. Houseman. "Effects of the Affordable Care Act on Part-Time Employment: Early Evidence." (2016).
- Finkelstein, Amy, et al. *The Oregon health insurance experiment: evidence from the first year*. No. w17190. National Bureau of Economic Research, 2011.
- Garthwaite, Craig, Tal Gross, and Matthew J. Notowidigdo. *Public health insurance, labor supply, and employment lock*. No. w19220. National Bureau of Economic Research, 2013.

- Goda, Gopi Shah, Monica Farid, and Jay Bhattacharya. The Incidence of Mandated Health Insurance: Evidence from the Affordable Care Act Dependent Care Mandate. No. w21846. National Bureau of Economic Research, 2016.
- Gruber, Jonathan, and Brigitte C. Madrian. Limited insurance portability and job mobility: The effects of public policy on job-lock. No. w4479. National Bureau of Economic Research, 1993.
- Kim, Daeho. "Health Insurance and Labor Supply: Evidence from the Affordable Care Act Early Medicaid Expansion in Connecticut." Available at SSRN (2016).
- Levine, Phillip B., Robin McKnight, and Samantha Heep. "How effective are public policies to increase health insurance coverage among young adults?." *American Economic Journal: Economic Policy* 3.1 (2011): 129-156.
- Linton, Oliver, Esfandiar Maasoumi, and Yoon-Jae Whang. "Consistent testing for stochastic dominance under general sampling schemes." *The Review of Economic Studies* 72.3 (2005): 735-765.
- Gruber, Jonathan, and Brigitte C. Madrian. "Health insurance and job mobility: The effects of public policy on job-lock." *Industrial & Labor Relations Review* 48.1 (1994): 86-102.
- Monheit, Alan C., et al. "How have state policies to expand dependent coverage affected the health insurance status of young adults?." *Health services research* 46.1p2 (2011): 251-267.
- Pohl, R. Vincent. "Medicaid and the labor supply of single mothers: implications for health care reform." (2014).

8 Appendix A

In Appendix A, explanation for DD coefficients is suggested.

		$Treat_m$		T_t		D_{mt}	
		2013	2014	2013	2014	2013	2014
FPL	High	$1(\lambda_{high})$	$1(\lambda_{high})$	$0(\gamma_{2013})$	$1(\gamma_{2014})$	0	1
	Low	$0(\lambda_{low})$	$0(\lambda_{low})$	$0(\gamma_{2013})$	$1(\gamma_{2014})$	0	0

$$\alpha_1 = E(Y_{imt}|m = low, t = 2013) = \lambda_{low} + \gamma_{2013}$$

$$\begin{aligned} \alpha_3 &= E(Y_{imt}|m = high, t = 2013) - E(Y_{imt}|m = low, t = 2013) \\ &= (\lambda_{high} + \gamma_{2013}) - (\lambda_{low} + \gamma_{2013}) \\ &= \lambda_{high} - \lambda_{low} \end{aligned}$$

$$\begin{aligned} \alpha_2 &= E(Y_{imt}|m = low, t = 2014) - E(Y_{imt}|m = low, t = 2013) \\ &= (\lambda_{low} + \gamma_{2014}) - (\lambda_{low} + \gamma_{2013}) \\ &= \gamma_{2014} - \gamma_{2013} \end{aligned}$$

$$\begin{aligned} \alpha_4 &= \{E(Y_{imt}|m = high, t = 2014) - E(Y_{imt}|m = high, t = 2013)\} \\ &\quad - \{E(Y_{imt}|m = low, t = 2014) - E(Y_{imt}|m = low, t = 2013)\} \\ &= (\gamma_{2014} - \gamma_{2013} + \alpha_2) - (\gamma_{2014} - \gamma_{2013}) \\ &= \alpha_4 \end{aligned}$$

9 Appendix B

Table 10: Check: With Child Labor Supply and Income

	LFP	Full-Time LF	Part-Time LF	Uhrsweek ⁺	Weeks Worked	Person Income	Total Wages
DD	-0.099** (0.042)	-0.075* (0.040)	-0.015 (0.032)	-3.465** (1.644)	-4.268** (2.041)	-0.055 (0.353)	-0.827** (0.421)
Time	0.069** (0.031)	0.030 (0.030)	0.028 (0.024)	-0.071 (1.122)	1.225 (1.516)	-0.226 (0.262)	0.110 (0.312)
Treatment	0.182*** (0.030)	0.152*** (0.029)	0.029 (0.023)	7.532*** (1.191)	10.142*** (1.479)	0.464* (0.256)	1.745*** (0.305)
Demographics							
Age	0.002 (0.001)	0.002* (0.001)	-0.000 (0.001)	0.046 (0.059)	0.118 (0.073)	0.035*** (0.012)	-0.015 (0.015)
Sex	0.208*** (0.023)	0.241*** (0.022)	-0.039** (0.018)	11.036*** (0.917)	10.500*** (1.139)	1.978*** (0.197)	1.979*** (0.235)
Race	-0.006 (0.026)	0.016 (0.025)	-0.023 (0.020)	0.575 (1.016)	0.330 (1.262)	-0.246 (0.218)	0.030 (0.260)
Marital Status	0.046 (0.031)	0.142*** (0.030)	-0.080*** (0.024)	3.314*** (1.222)	4.5120*** (1.517)	-0.606** (0.262)	0.548* (0.313)
Education	0.066*** (0.013)	0.062*** (0.012)	0.004 (0.010)	3.032*** (0.515)	3.194*** (0.639)	0.677*** (0.110)	0.763*** (0.132)
Child Under 6	0.006 (0.014)	0.008 (0.014)	0.002 (0.011)	0.921 (0.567)	1.157* (0.704)	0.169 (0.121)	0.256* (0.145)
Years of work	-0.000 (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.046 (0.053)	-0.052 (0.066)	0.009 (0.011)	0.003 (0.013)
Unemployment Duration	-0.007*** (0.000)	-0.005*** (0.000)	-0.002*** (0.000)	-0.159*** (0.031)	-0.278*** (0.039)	-0.032** (0.006)	-0.046*** (0.008)
Unemployment Rate	0.012 (0.009)	0.005 (0.009)	0.003 (0.007)	-0.297 (0.367)	0.015 (0.456)	-0.072 (0.078)	-0.048 (0.094)
Spouse's Income	-0.010*** (0.003)	-0.015*** (0.002)	0.003 (0.002)	-0.457*** (0.116)	-0.658*** (0.144)	-0.075*** (0.025)	-0.075** (0.029)
Obs.							

* Note that Uhrsweek means Usual Hours Worked per week., () is standard error., *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

Table 11: Check: Childless Labor Supply and Income

	LFP	Full-Time LF	Part-Time LF	Uhrsweek ⁺	Weeks Worked	Person Income	Total Wages
DD	-0.082* (0.047)	-0.083* (0.045)	0.001 (0.034)	-2.557 (1.910)	-3.950** (2.339)	-0.266 (0.393)	-0.602 (0.477)
Time	0.060 (0.042)	0.058 (0.040)	-0.000 (0.030)	1.326 (1.729)	2.415 (2.118)	0.216 (0.356)	0.171 (0.432)
Treatment	0.239*** (0.034)	0.216*** (0.033)	0.033 (0.025)	10.764*** (1.401)	13.922*** (1.715)	0.795*** (0.288)	2.645*** (0.350)
Demographics							
Age	-0.006*** (0.000)	-0.001* (0.000)	-0.004*** (0.000)	-0.130*** (0.040)	-0.244*** (0.048)	0.032*** (0.008)	-0.051*** (0.010)
Sex	0.015 (0.019)	0.053*** (0.018)	-0.036** (0.014)	2.485*** (0.799)	0.918 (0.980)	0.642*** (0.164)	0.313 (0.200)
Race	0.061*** (0.021)	0.071*** (0.020)	-0.012 (0.015)	4.314[***] (0.861)	3.920*** (1.055)	0.737*** (0.177)	0.754*** (0.215)
Marital Status	0.097*** (0.028)	0.135*** (0.027)	-0.049** (0.020)	4.359*** (1.141)	5.077*** (1.397)	-0.182 (0.235)	0.962*** (0.285)
Education	0.066*** (0.010)	0.066*** (0.009)	-0.002 (0.007)	3.275*** (0.416)	2.716*** (0.509)	0.675*** (0.085)	0.767*** (0.104)
Years of Work	0.000 (0.000)	-0.000 (0.000)	0.001*** (0.000)	-0.059* (0.034)	0.003 (0.042)	-0.002 (0.007)	-0.008 (0.008)
Unemployment Duration	-0.006*** (0.000)	-0.005*** (0.000)	-0.002*** (0.000)	-0.143*** (0.024)	-0.265*** (0.030)	-0.049*** (0.005)	-0.037*** (0.006)
Unemployment Rate	0.014 (0.008)	0.016* (0.008)	-0.001 (0.006)	0.637* (0.360)	0.797* (0.441)	0.033 (0.074)	0.077 (0.090)
Spouse's Income	-0.002 (0.003)	-0.007** (0.003)	0.005** (0.002)	-0.087 (0.136)	-0.133 (0.166)	-0.015 (0.028)	0.008 (0.034)
Obs.							

* Note that Uhrsweek means Usual Hours Worked per week., () is standard error., *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

Table 12: Check: DDD: Labor Supply and Income

	LFP	Full-Time LF	Part-Time LF	Uhrsweek ⁺	Weeks Worked	Person Income	Total Wages
DDD	0.017 (0.064)	-0.006 (0.061)	0.016 (0.047)	0.844 (2.539)	0.261 (3.127)	-0.243 (0.531)	0.230 (0.639)
Time	0.074** (0.030)	0.039 (0.029)	0.026 (0.022)	0.538 (1.205)	1.818 (1.485)	-0.204 (0.252)	0.205 (0.303)
Treatment	0.181*** (0.030)	0.155*** (0.029)	0.024 (0.022)	7.385*** (1.204)	10.135*** (1.483)	0.361 (0.252)	1.713*** (0.303)
Child Status	-0.168*** (0.039)	-0.165*** (0.037)	-0.013 (0.029)	-7.935*** (1.553)	-8.847*** (1.914)	-1.103*** (0.325)	-1.695*** (0.391)
Treatment*Time	-0.098** (0.042)	-0.076* (0.040)	-0.013 (0.031)	-3.428** (1.679)	-4.189** (2.068)	-0.037 (0.351)	-0.828** (0.432)
Time*Child Status	-0.020 (0.051)	0.008 (0.049)	-0.026 (0.038)	0.107 (2.049)	-0.081 (2.524)	0.340 (0.429)	-0.146 (0.516)
Treatment*Child Status	0.071 (0.045)	0.071 (0.043)	0.012 (0.033)	4.272** (1.814)	4.597** (2.234)	0.632* (0.380)	1.099** (0.457)
Demographics							
Age	-0.003*** (0.000)	-0.000 (0.000)	-0.003*** (0.000)	-0.064* (0.033)	-0.119*** (0.040)	0.036*** (0.006)	-0.038*** (0.008)
Sex	0.101*** (0.015)	0.139*** (0.014)	-0.037*** (0.011)	6.245*** (0.597)	5.249*** (0.736)	1.176*** (0.125)	1.027*** (0.150)
Race	0.037** (0.016)	0.051*** (0.015)	-0.014 (0.012)	2.868*** (0.656)	2.600*** (0.808)	0.320** (0.137)	0.472*** (0.165)
Marital Status	0.099*** (0.020)	0.160*** (0.019)	-0.060*** (0.015)	4.846*** (0.824)	6.048*** (1.015)	-0.247 (0.172)	0.969*** (0.207)
Education	0.069*** (0.008)	0.068*** (0.007)	-0.001 (0.006)	3.304*** (0.323)	3.057*** (0.398)	0.686*** (0.067)	0.798*** (0.081)
Child uner 6	-0.014 (0.013)	-0.005 (0.013)	-0.003 (0.010)	0.492 (0.552)	0.337 (0.680)	0.165 (0.115)	0.144 (0.139)
Years of Work	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.060** (0.029)	-0.022 (0.036)	0.001 (0.006)	-0.005 (0.007)
Unemployment Duration	-0.007*** (0.000)	-0.005*** (0.000)	-0.002*** (0.000)	-0.145*** (0.019)	-0.265*** (0.024)	-0.042*** (0.004)	-0.039*** (0.004)
Unemployment Rate	0.012* (0.006)	0.010* (0.006)	0.003 (0.004)	0.144 (0.258)	0.387 (0.318)	-0.032 (0.054)	0.004 (0.065)
Spouse's Income	-0.008*** (0.002)	-0.012*** (0.002)	-0.004*** (0.001)	-0.351*** (0.088)	-0.491*** (0.109)	-0.059*** (0.018)	-0.051** (0.022)
Obs.							

* Note that Uhrsweek means Usual Hours Worked per week., () is standard error., *: p-value<0.10, **: p-value<0.05, ***: p-value<0.01

미국의 2014년 저소득층 지원 의료보험 수혜범위
확대가 자녀가 없는 성인들에게 미친 영향: 초기효과
Impacts of Affordable Care Act 2014 Medicaid
Expansion
on Childless Adults: Early Effect.

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요약

미국에서 2013년 3월 흔히 오바마 케어로 불리는 의료보험개혁안(Affordable Care Act)이 인준되고 같은 해 9월 23일 시행되었다. 그 후 의료보험 개혁의 효과는 꾸준히 연구되어왔다. 본 논문에서는 이중차분(Difference-in-Difference) 방법과 삼중차분(Difference-in-Difference-in-Difference) 방법을 이용하여 의료보험개혁이 수혜자들의 노동공급에 미친 영향을 분석했다. 본 연구에서 처치집단은 2014년 이후에 저소득층을 위한 의료보험(Medicaid)혜택을 받은 사람들로 구성되었다. 이들은 2014년 이전에는 의료보험(Medicaid)혜택을 받지 않은 사람들이다. 또한 통제 집단으로는 2013년과 2014년에 모두 의료보험(Medicaid)혜택을 받은 사람들로 구성되었다. 또한 본 연구에서는 아이의 존재 여부에 따른 수혜자들의 노동공급에서의 행태 변화를 분석해 보았다. 분석 결과 아이의 존재 유무와 관계없이 처치집단에서 노동공급을 유의미 하게 감소시킨다는 사실을 알 수 있었다. 다만, 한 가지 주목할 점은 아이가 있는 집단이 노동공급을 더 많이 줄인다는 점이다.

키워드: 미국 저소득층 의료보험, 노동공급, 자녀가 없는 성인, 오바마 케어, 전체 임금
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