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EFFECTS OF ACA MEDICAID EXPANSIONS ON HEALTH INSURANCE COVERAGE AND LABOR SUPPLY

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ABSTRACT

We examined the effect of the expansion of Medicaid eligibility under the Affordable Care Act on health insurance coverage and labor supply of adults with a high school education or less. We found that the Medicaid expansions increased Medicaid coverage by approximately 4 percentage points, decreased the proportion uninsured by approximately 3 percentage points, and decreased private health insurance coverage by 1 percentage point. The Medicaid expansions had little effect on labor supply as measured by employment, usual hours worked per week and the probability of working 30 or more hours per week. Most estimates suggested that the expansions increased employment slightly, although not significantly.

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1. Introduction

One of the key features of the Affordable Care Act (ACA) was the expansion of Medicaid to adults with incomes below 138% of the federal poverty level. Low-income adults were largely ineligible for Medicaid prior to the ACA and this group also had relatively low rates of health insurance coverage. Therefore, expanding Medicaid to this group was seen as important way to reduce the number of uninsured persons, which was one of the central goals of the ACA. Preliminary evidence, for example, from the Office of the Assistant Secretary for Planning and Evaluation (ASPE), suggests that the expansions have been effective. The proportion of persons uninsured declined by 45% in states that expanded Medicaid and by 31% in states that did not expand Medicaid.[1]

While the Medicaid expansions were clearly targeted at expanding health insurance coverage, the income-based eligibility criterion of the expansion may have unintended effects on work effort. There are several reasons why the Medicaid expansions may affect work.[2] First, some people may reduce work effort to lower their income and gain Medicaid eligibility. Second, some people may reduce work effort because Medicaid coverage virtually eliminates out-of-pocket medical expenditures and health insurance premium contributions, and allows a person to work less to generate the same amount of consumption (income). Third, some people may increase work effort because they can work and earn more than before the Medicaid expansion and still remain eligible for Medicaid due to the higher Medicaid income eligibility threshold.[3] Finally, the Medicaid expansions may have some, albeit small, positive effect on aggregate economic activity that could increase employment. The Congressional Budget Office (2014)

[1] The figures cited were calculated using information at: http://aspe.hhs.gov/basic-report/health-insurance-coverage-and-affordable-care-act-september-2015.

[2] A report by the Congressional Budget Office (2014) describes the intuition underlying the causal links between Medicaid and labor supply, and earlier studies by Blank (1989) and Yelowitz (1995) present simple models that generate similar hypotheses.

[3] Another possibility is that some people will switch jobs from one that provides employer-provided insurance and a relatively low wage to one that does not provide employer-provided insurance and a relatively higher wage, but that still allows for Medicaid coverage. The higher wage of the new job would have substitution and income effects that could change work effort.

estimated that, on net, the Medicaid expansions would have a small, negative effect on employment.[4] Specifically, the CBO estimates that the ACA will reduce total hours worked by 1.7 percent, or 2 million fewer full-time equivalent workers.

To reach their conclusion, the Congressional Budget Office (2014) relied on a synthesis of the evidence from a few recent, case studies of the effect of Medicaid expansions on labor supply. Perhaps the most important of these studies was Baicker et al. (2013), which examined the effect of expanding Medicaid to childless adults in Oregon in 2008 using an experimental research design. These authors reported that gaining Medicaid coverage was associated with a small—1.6 percentage point (3%)—and statistically insignificant change in employment and earnings. The findings are particularly compelling because of the experimental design and high internal validity. Another study by DeLeire et al. (2013) examined an expansion of Medicaid to childless adults in Wisconsin in 2009. Here too, there was an innovative research design (i.e., regression discontinuity) with plausible internal validity that exploited the capping of enrollment that left eligible people unable to enroll in Medicaid after a certain date. Results reported in this study indicated that Medicaid enrollment was associated with between a 2% to 18% percent decrease in employment. A third study by Garthwaite et al. (2014) examined the rollback of Medicaid eligibility in Tennessee in 2005. For this analysis, a difference-in-differences research design was used with Tennessee the treated state and other Southern states the control states. Results of the analysis were mixed. Among low-educated, childless adults, the change in Medicaid policy was associated with a 25% increase in employment, but there was no effect for other educational groups. While estimates in Garthwaite et al. (2014) are intention-to-treat estimates and not directly comparable to estimates from Oregon and Wisconsin, Garthwaite et al. (2014) estimated that between 63 and 90 out of every 100 childless adults that lost "public" health insurance coverage found employment. This is a very

[4] See Appendix C of Congressional Budget Office (2014) report, "Labor Market Effects of the Affordable Care Act: Updated Estimates." *The Budget and Economic Outlook: 2014 to 2024*: 117-127. Feb. 2014: http://www.cbo.gov/sites/default/files/cbofiles/attachments/45010-breakout-AppendixC.pdf. Also see Congressional Budget Office (2015). "How CBO Estimates the Effects of the Affordable Care Act on the Labor Market." Working Paper 2015-09. December 2015.

large implied effect of Medicaid that differs dramatically from estimates in the Oregon and Wisconsin studies.[5]

As this short review of the literature has revealed, previous studies of the effect of Medicaid on labor supply have not produced a consensus conclusion.[6] This is an important gap in knowledge because of the importance of this issue for both economic theory and public policy. Economic theory predicts that income-based social programs will bring forth behavioral responses with respect to work effort. Therefore, measuring the existence and magnitude of a behavioral, labor supply response to a large and recent expansion in Medicaid will provide empirical evidence to assess a fundamental theoretical principle. Moreover, two of the recent case studies of the effect of Medicaid on labor supply (OR and WI studies) were conducted using a sample of persons always eligible for Medicaid and, therefore, do not allow for one potentially important behavioral response—"jumping on" Medicaid by lowering income to gain eligibility (Mulligan 2013). For public policy, knowing whether there are unintended consequences related to work effort associated with Medicaid is an important component of a cost-benefit analysis of the effectiveness of Medicaid. If there are large changes in work effort associated with Medicaid, for example, declines along the lines suggested by the Garthwaite et al. (2014) study of Tennessee, then the net benefit of the Medicaid expansions would be substantially lower than otherwise and might lead to a rollback of Medicaid and expansion of other policies aimed at reducing the uninsured.

In sum, the absence of a consensus from the relatively small prior literature related to whether Medicaid affects labor supply and the importance of the issue for theory and policy warrants additional study. In this paper, we examine the effect of the ACA Medicaid expansions on health insurance coverage and labor supply. While the original formulation of the ACA Medicaid expansions was that it would be implemented in all states, a ruling by the Supreme Court allowed states to opt out of the expansion and

[5] Estimates in Garthwaite et al. (2014) also suggest employment responses to changes in income (the value of Medicaid) that are 20 to 60 times the size of estimates found in most prior studies. See McClelland and Mok (2012): https://www.cbo.gov/sites/default/files/cbofiles/attachments/10-25-2012-Recent_Research_on_Labor_Supply_Elasticities.pdf

[6] There is also a literature that examined the effect of Medicaid expansions for pregnant women and children in late 1980s and 1990s: Yelowitz (1995); Montgomery and Navin (2000); Ham and Shore-Shepard (2005); Meyer and Rosenbaum (2001); and Decker et al. (2014). These studies also reported mixed results.

approximately half did so.[7] Thus, we exploit the state-variation in expansions resulting from the Supreme Court ruling to assess the effect of Medicaid on insurance coverage and labor supply. We use two research designs: difference-in-differences and synthetic control. Data for the analysis are drawn from the American Community Survey (ACS) and Current Population Survey (CPS) for the period from 2010 to 2014(15).

We study both health insurance coverage and labor supply because insurance coverage is itself an important outcome of interest, and because changes in labor supply will be partly reflected by changes in insurance coverage. For example, if people reduce labor supply to become eligible for Medicaid, then we should see an increase in Medicaid coverage, a reduction in uninsured and possibly a reduction in private insurance if the person replaced their private insurance with Medicaid. Similarly, low-income, working persons may gain Medicaid coverage because of the expanded income eligibility. For this group the extra income associated with Medicaid may cause them work less and the gain in coverage indicates the size of the group affected. Therefore, changes in insurance coverage, particularly Medicaid, provide some evidence of the extent of treatment (i.e., Medicaid expansion) and the size of the group that may change labor supply in response, although not perfectly.

Results of our study indicate that among adults with a high school education or less, which is the sample of our study, the ACA Medicaid expansions increased Medicaid coverage by approximately 4 percentage points, decreased the proportion uninsured by approximately 3 percentage points and decreased private insurance by 1 percentage point, although there was variation in these figures across demographic groups stratified by presence of children and marital status. Larger effects of the 2014 Medicaid expansion on health insurance was found for childless adults without children. These changes in insurance coverage were, in general, associated with few significant changes in labor supply among this group. If anything, there is some, limited evidence that the 2014 expansion was associated with an increase in employment. In addition, back-of-the-envelope estimates of treatment-on-treated effects of the 2014 expansions rule out modest to large, negative behavioral effects of Medicaid on labor supply.

[7] See http://www.supremecourt.gov/opinions/11pdf/11-393c3a2.pdf

2. ACA Medicaid Expansions

As noted, the Supreme Court decision that allowed states to opt out of the ACA Medicaid expansions resulted in approximately half the states not expanding Medicaid. Moreover, among those that did expand, several states already had expanded Medicaid to adults, for example, parents. Therefore, these states may not have experienced any real change in Medicaid eligibility for some groups. Finally, three states expanded Medicaid in 2015, one year later than allowed by the ACA. In short, classifying states as to whether they did or did not experience an effective change in policy is not as simple as assessing whether they expanded Medicaid in 2014 as part of the ACA.

To classify states into those experiencing a change in Medicaid policy ("treated") and those not experiencing a change in Medicaid policy ("control"), we reviewed several sources of information.[8] Table 1 provides a list of states and how we classified them into treated and control groups. States included in the control group are:

- States that did not expand Medicaid in 2014 and that had no prior Medicaid expansion between 2010 and 2014: AL, AK, FL, GA, ID, KS, LA, MS, MO, MT, NE, NC, OK, PA, SC, SD, TX, UT, VA, WY (20).
- States that did not expand Medicaid in 2014 and that had prior, but limited Medicaid expansions between 2010 and 2014: IN, ME, TN, WI (4).
- States that expanded Medicaid in 2014, but that had prior and comprehensive Medicaid expansion similar to ACA for both parents and childless adults between 2010 and 2014: DE, DC, MA, NY, VT (5).

The control group consists of 30 states. Note that we include IN, ME, TN and WI as control states even though they had some prior Medicaid expansions between 2010 and 2014. However, the prior Medicaid

[8] Medicaid eligibility rules were determined using Kaiser Family Foundation's Annual 50 State Survey of Eligibility Rules, Enrollment and Renewal Procedures, and Cost-Sharing Practices in Medicaid and CHIP (2009 through 2015), Medicaid.gov demonstrations and waivers database (http://www.medicaid.gov/medicaid-chip-program-information/by-topics/waivers/waivers_faceted.html), Kaiser Family Foundation's state-specific fact sheets, healthinsurance.org Medicaid state-specific fact sheets, and individual state Medicaid websites.

expansions in these states were limited (e.g., capped or closed enrollment). To assess whether including states with prior expansions, either comprehensive as in MA or limited as in IN, made a difference, we re-estimated all models excluding these states from the analysis and we report the results below. We note here that dropping these states had little effect on estimates. Finally, only one state changed status between 2010 and 2013; Colorado expanded eligibility to childless adults in 2012, but capped the program at 10,000.

The treated states are the following:

- States that expanded Medicaid in 2014 and that had no prior Medicaid expansion: AK, KY, MI, NH, NV, NM, ND, OH, WV (9).
- States that expanded Medicaid in 2014 and that had a prior, but not comprehensive, Medicaid expansion for parents and/or childless adults: AZ, CA, CO, CT, HI, IA, IL, MD, MN, NJ, OR, RI, WA (13).

We note that Michigan expanded in April of 2014 and New Hampshire expanded in August of 2014. We include both in treated group because Michigan expanded for most of the year and New Hampshire is a small state and the partial year expansion is unlikely to make a difference to estimates. In addition, Indiana and Pennsylvania expanded Medicaid in 2015.

We divided the treated states into two groups depending on whether they had a previous expansion. However, if a state had expanded Medicaid fully (comprehensively) to both parents and childless adults (DE, DC, MA, NY, VT), which is the equivalent of the ACA expansion, these states were included in the control group of states. Thus, the second group of states in the treated category consists of states with a full parental expansion of Medicaid and states with limited expansions for parents and/or childless adults. On the one hand, it is reasonable to expect that the effect of the 2014 (ACA) expansion of Medicaid will be smaller in states with previous expansions of Medicaid, although many of these expansions were quite limited. Most were focused on parents. On the other hand, if take-up of Medicaid among eligible persons was relatively low, the individual mandate that required all people to have health

insurance and the public outreach (i.e. marketplaces) that became effective in 2014 may cause those always eligible for Medicaid to obtain it and this would suggest smaller differences between the two groups of states that expanded Medicaid in 2014. Empirically, we test whether the effect of Medicaid differed in the two groups of treated states. We also explored whether to divide the second group of treated states into a finer classification based on the type of previous expansion, but tests indicated that these two categories were the only empirically relevant groupings.[9]

3. Empirical Approach

3.a. Data

The data used in the analysis come from the American Community Survey (ACS) and the monthly files of the Current Population Survey (CPS). For the ACS, we used annual surveys from 2010 to 2014, which spans the implementation of Medicaid expansions in 2014. The ACS collects information on approximately three million people each year covering over 92% of the U.S. population in each year. The survey is conducted on a monthly basis throughout the year and combined into an annual file. For the CPS, we used the monthly surveys from January 2010 through November 2015. Note that for analyses that use the CPS, we do not use data from Indiana and Pennsylvania because these two states expanded in 2015. While this later expansion can be accommodated in the difference-in-differences research design, it is not feasible in the synthetic control approach. Therefore, we drop these two states when using the CPS.

We limit the sample to non-disabled, adults between the ages of 22 and 64 who have a high school education or less. We limit the sample to relatively low-educated adults because Medicaid is targeted at low-income persons and education is strongly related to income. We cannot use income to select the sample because Medicaid may affect income and this would lead to biased estimates of the effect of Medicaid. We conduct analyses using all persons with a high school education or less and

[9] Specifically, we divided the second group of treated states into those with and without a full Medicaid expansion to parents. We could not reject the hypothesis that these two groups had similar effects on outcomes.

stratified this sample by marital status (married, not married) and age.[10] Again, we stratify the sample by demographic characteristics associated with income in order to focus on groups most likely affected by the Medicaid expansions. Finally, we also conduct analyses for samples divided by whether or not there are children under the age of 18 in the household. Most prior Medicaid expansions were targeted toward low-income parents, so this group may be less affected by the ACA Medicaid expansions, and there may be differences in the effect of Medicaid by whether children are present because of differences in household income and preferences.

The ACS collects information on health insurance coverage at the time of interview, employment at the time of interview, usual hours of work in last calendar year, and demographic characteristics. The CPS collects similar information, although there are some differences that we note below. The dependent variables for our analyses are the following:

- Health Insurance: Medicaid, private insurance, and uninsured
- Labor Supply: employed at time of interview, usual hours worked per week; and worked 30 or more hours per week

To measure health insurance, we use only the ACS because there have been changes to the CPS health insurance questions over time that make it less useful for analyses of changes in insurance over time (Pascale 2015).[11] The ACS allows people to report more than one health insurance category and 2.4% report having Medicaid and other type of insurance. The usual hours worked per week variable in the ACS refers to the last calendar year. Therefore, people currently not working can report positive hours per week if they worked last year and not at the time of interview. We set hours per week to zero for those not currently working. We do so to focus the analysis of the effect of Medicaid on the current period, which better reflects the time when the Medicaid expansion policy was in place. In the CPS, the usual hours worked variable refers to the job at the time of interview.

[10] Further stratification by marital status and education was not empirically meaningful—we could not reject the equality of estimates by education group within marital status category.
[11] See https://www.census.gov/srd/papers/pdf/SSM2015-03.pdf

The key independent variables for the analysis are the treatment group indicators listed in the previous section and Table 1. We estimate models using both indicators and test whether the coefficients differ and models where we combine states into one treatment group. Other independent variables include dummy variables for each year of age; dummy variables for race/ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic other, and Hispanic), dummy variables for marital status (married, never married, and other), dummy variables for education (high school degree and less than high school degree), dummy variables for number of children (0, 1, 2, and 3 or more), and dummy variables for family size (1, 2, 3, 4 and 5 or more).

Descriptive statistics of the variables used in the analysis are presented in Table 2.[12] These statistics are based on data from 2010, the baseline period. The means of all variables are very similar in the two surveys. Approximately 68 percent of people in each sample are employed at the time of interview in 2010 and approximately 60% are working 30 or more hours per week. The mean age of the samples is approximately 43 years and 62% of the two samples are non-Hispanic white. In each sample approximately 60% of people are married, 36% have children under age 18 in the family, and three quarters of each sample have a high school degree.

3.b. Difference-in-differences Research Design

The ACA Medicaid expansions provide state by year variation in Medicaid eligibility that can be used to obtain estimates of the effect of Medicaid eligibility on health insurance coverage and labor supply. The expansions represent a source of plausibly exogenous variation in Medicaid eligibility, although clearly states chose whether to expand or not and therefore, the exogeneity of the expansions needs to be assessed. Accordingly, we use a difference-in-differences (DiD) research design to obtain estimates of the effect of the expansions on health insurance and labor supply. The DiD design is a straightforward approach that is intended to mimic the pre- and post-test with comparison group design of a true experiment.

[12] These are unweighted estimates.

We have already described the classification of states into treatment and control groups. Given this classification, DiD estimates can be obtained using the following regression model:

(1) $$HEALTHINS_{ijt} = \alpha_0 + \beta_j + \delta_t + \lambda(TREAT_j * Y2014_t) + X_{ijt}\Gamma + e_{ijt}$$

Equation (1) indicates that the health insurance coverage, for example, Medicaid, of person "i" in state "j" and year 't" depends on state fixed effects (β_j), year fixed effects (δ_t), an indicator of whether the state is in treated group and the year is 2014 ($TREAT_j * Y2014_t$), and demographic characteristics (X_{ijt}) such as age that were previously described. In equation (1), the dependent variable is health insurance, but analogous models will be estimated using labor supply measures.

We also estimate a version of equation (1) that allows there to be two treatment groups: states that expanded Medicaid in 2014 and had no prior expansions and states that expanded Medicaid in 2014, but had some form of prior expansion. The model that allows for effects to differ by treatment group type is:

(2) $$\begin{aligned} HEALTHINS_{ijt} = {} & \alpha_0 + \beta_j + \delta_t + \lambda_1(TREAT\_NOPRIOR_j * Y2014_t) + \\ & \lambda_2(TREAT\_PRIOR_j * Y2014_t) + X_{ijt}\Gamma + e_{ijt} \end{aligned}$$

In equation (2), there are two treatment indicators and two coefficients measuring the effect of Medicaid expansions in the different types of treatment states. We test whether $\lambda_1 = \lambda_2$ to assess whether the prior expansion of Medicaid resulted in different effects of the 2014 expansion.

The key assumption underlying the validity of the DiD approach is the parallel trends assumption—that in the absence of the ACA Medicaid expansions changes in health insurance and labor supply would be the same in treated and control states. To assess the likely validity of this assumption, we estimate a model allowing for a complete set of interactions between the indicator of treatment status and years:

(3) $$HEALTHINS_{ijt} = \alpha_0 + \beta_j + \delta_t + \sum_{k=2011}^{2014} \lambda_k (TREAT_j * YEAR_t) + X_{ijt}\Gamma + e_{ijt}$$

The only difference between equations (1) and (3) is that the effect of treatment is allowed to differ for every year instead of just 2014. The parallel trends assumption implies that the coefficients on the

interaction terms between treatment and year (λ_k) would be zero in years prior to 2014. We test this hypothesis and report results below, but note at this time that the evidence from this analysis generally supports the validity of the research design.

3.b. Synthetic Control

A second approach to obtaining estimates of the effect of the Medicaid expansions on labor supply is that proposed by Abadie et al. (2010). This approach uses a matching procedure to create a synthetic comparison (control) group that is a weighted average of states that did not expand Medicaid. While technically not a DiD approach, the Abadie et al. (2010) approach is similar because the estimate of the effect of Medicaid is obtained by taking the difference in means between treated states and a weighted average of non-treated states. However, only the post-expansion difference is used to calculate the estimate because the approach assumes that pre-expansion differences between treated and non-treated states are zero. Indeed, the central feature of the Abadie et al. (2010) method is to select a comparison group in such a way as to minimize—reduce toward zero—the pre-expansion differences in means between treated states and the synthetic comparison group.

The key to the Abadie et al. (2010) approach is selecting the weights that are used to construct the synthetic comparison group (i.e., weighted average), or counterfactual outcome. Abadie et al. (2010) suggest choosing weights that minimize differences between the pre-treatment mean outcome and covariates of treated and untreated observations.[13] The unit of observation in this approach is the state. The argument underlying this approach is that if the pre-treatment means of the treated and control states are equal, then the post-treatment difference is likely to represent a valid estimate of the policy. An advantage of the synthetic control approach is that the closeness of the match between the treated and

[13] See Abadie et al. (2010) for details.

control states can be assessed easily, for example, graphically, and the weight for each potential comparison state is provided.[14]

There are a variety of ways to select weights that are used to construct the synthetic comparison group, for example, by minimizing the difference between each pre-period value of the dependent variable and covariates of treated and untreated states. Alternatives include using the average of pre-period outcomes to match on instead of each pre-period outcome, or to match on the average and only the last pre-period outcome. We chose to match states using each pre-period value of the dependent variable and covariates, but we also report estimates from an alternative approach that uses only the average value of pre-2014 dependent variable, the 2013 value and each pre-2014 value of covariates.[15]

Once the weights are selected and the synthetic comparison group constructed, then the estimate of the effect of the Medicaid expansion is derived by taking the difference between the mean outcome in the treated states (treated as one unit) and the mean outcome in the synthetic comparison group, which is just a weighted average of outcomes in the non-expanding states. Inferences for this estimate are derived from permutation tests (randomization inference) that consist of re-doing the analysis 1000 times, but each time using a randomly selected group of treatment states. After generating these 1000 "random" estimates, the p-value of the estimate of the effect of Medicaid expansion on labor supply is the number of "random" estimates that are larger in absolute value than the actual estimate for the true treated states.

4. Results

4.a. Estimates of the Effect of ACA Medicaid Expansions on Health Insurance

We begin the discussion of results with the effect of the Medicaid expansions on health insurance coverage. Table 3 presents difference-in-differences estimates, which are derived from data from the ACS. The table is organized as follows. There are two panels that present results for parents (children under 18 in family)—the top panel—and childless (no children under 18 in family) adults—the bottom

[14] Only states with positive weights are used to construct the synthetic comparison group.
[15] See Kaul et al. (2015) for an analysis of the potential consequences of different approaches. Using every value of the pre-period dependent variables makes matching on covariates less important.

panel.[16] Within each panel and for each of the three health insurance outcomes—Medicaid, uninsured and private—estimates from two model specifications are presented in separate rows (top and bottom row). In one model (top row), we combine all states that expanded Medicaid in 2014 into one treatment group. In the second model (bottom row), we allow the effect of the Medicaid expansions to differ depending on whether the state had a prior expansion of some type. Finally, we present estimates for each outcome and each sample (parents and childless adults) for observations further stratified by marital status.

Estimates in the top panel (parents) and top row of Table 3 indicate that the ACA Medicaid expansions were associated with an increase in Medicaid coverage, a decrease in the proportion uninsured, and a decrease in private insurance coverage. Estimates related to Medicaid and uninsured are statistically significant. The 2014 Medicaid expansions increased Medicaid coverage by approximately 4 percentage points. The increase in Medicaid was associated with a 2 to 3 percentage point decline in uninsured and a 1 to 2 percentage point decline in private insurance. The decline in private insurance suggests some amount of crowd out of private for public insurance. For the sample of parents as a whole, approximately 25% of the increase in Medicaid may have come from private insurance. Estimates in the bottom row of the top panel reveal that, among married parents, the effect of the 2014 Medicaid expansions did not differ significantly, or meaningfully, by whether a state had a prior Medicaid expansion. However, for not married parents, the effect of the 2014 expansion was noticeably, if not statistically, different by whether the state had a prior Medicaid expansion, which were mainly targeted at parents. The substitution of private for public coverage appears to have occurred mostly among the not married, parent sample in states that had previously expanded Medicaid; for this group of parents, the 2014 Medicaid expansion was associated with a 3.5 percentage increase in Medicaid and a 2.4 percentage point decrease in private insurance.

In the bottom panel of Table 3, estimates of the effect of the 2014 expansions on childless adults are presented. Here too estimates indicate that the 2014 expansions were associated with an increase in

[16] Estimates for the pooled sample are in Appendix Table 1.

Medicaid coverage and a decrease in uninsured, but in this case, there is virtually no change in private insurance. However, there are substantial differences by marital status for this group with effect sizes larger in absolute value for the not married group. Among the married group of childless adults, the 2014 Medicaid expansions were associated with a 2.5 percentage point increase in Medicaid coverage and a 2.2 percentage point decrease in uninsured. For the not married group of childless adults, the 2014 expansion is associated with a 5.2 percentage point increase in Medicaid and a 4.4 percentage point decrease in uninsured. As estimates in the bottom row on the bottom panel indicate, the effect of the 2014 expansions on health insurance coverage of childless adults did not differ by whether the state had a prior expansion, which is consistent with the fact that most prior expansions were targeted at parents.

As previously noted, the validity of the difference-in-differences estimates in Table 3 depend on the parallel trends assumption that in the absence of the Medicaid expansions changes in health insurance coverage would be the same in treated and control states. To assess the likely validity of this assumption, we re-estimated the models that produced the estimates in Table 3, but allowed the treatment indicator to differ by every year instead of just 2014. We refer to estimates from these analyses as event history estimates. The parallel trends assumption implies that all pre-2014 interactions between the treatment indicator and the year dummy variables are zero.

Table 4 presents the event history estimates. While estimates are not all independent, there are 54 different event history estimates in Table 4 that are relevant—pertaining to pre-2014 estimates. Only five of the 54 estimates are statistically different from zero. If we consider only samples stratified by marital status (ignore estimates obtained from combined sample of married and not married), of the 36 pre-2014 interactions, only three estimates are statistically different from zero. Even when estimates are different from zero, they are much smaller than the estimates associated with the 2014 interaction. Overall, the event history estimates support the validity of the DiD approach. Given this finding, it is reasonable to interpret the estimates in Table 3 as causal effects of the 2014 Medicaid expansions.

The synthetic control approach is also relevant to the assessment of the validity of the estimates in Table 3. While not a difference-in-differences approach, the synthetic control approach is similar. In this case, the control states are chosen on the basis of a statistical, matching procedure instead of simply using all non-expansion states as controls, as in the difference-in-differences design. In Table 5, we present estimates obtained using the synthetic control approach. Figures 1 through 6 provide graphical evidence of the validity of the synthetic control approach. In all figures, the pre-2014 trend in each measure of health insurance is very similar between the treated states and synthetic control group of states. For comparison, we also show the analogous difference-in-differences estimates from Table 3 in Table 5. Note that p-values for the synthetic control estimates are provided in parentheses in Table 5 because the randomization inference approach produces only p-values.

Overall, synthetic control estimates are quite similar to difference-in-differences estimates. For the childless adult sample, the two sets of estimates are virtually the same with very minor differences; both sets of estimates indicate that the 2014 Medicaid expansion increased Medicaid coverage and decreased the proportion uninsured by approximately 4 percentage points for the combined sample of married and not married childless adults. Even when there are some modest differences between the synthetic control and difference-in-differences estimates, for example, among married, parents, the differences do not alter the basic inferences. The similarity of the synthetic control and difference-in-differences estimates bolsters the case for interpreting the estimates as causal. Finally, we also estimated synthetic control models using a different approach to select weights for constructing the control group. Specifically, we used the average value of health insurance between 2010 and 2013 and the 2013 value instead of each individual value. Estimates from this alternative were virtually identical to those reported in Table 5.

We also conducted analyses for samples stratified by age, which is a demographic factor related to income, and therefore likely eligibility, and other determinants of health insurance coverage that could cause a different behavioral response. We report these results in Appendix Table 2. Estimates of the effect

of the 2014 Medicaid expansions on health insurance coverage do not vary significantly or meaningfully by age. The expansions had a slightly larger effect on Medicaid coverage and the proportion uninsured among younger (ages 22 to 44), low-educated adults than comparable older (ages 45 to 64) adults.

Finally, we re-estimated all models dropping the nine control states that had prior expansions: DE, DC, MA, NY, VT, IN, ME, TN and WI. We report both difference-in-differences and synthetic control estimates in Appendix Table 3 along with corresponding estimates from Tables 3 and 5 for comparison. Difference-in-differences estimates are quite similar in all cases whether we include or exclude the nine control states. Synthetic control estimates, however, differ from the corresponding estimates in Table 5. The deviation is because the synthetic control approach is demonstrably not valid in the analysis that drops the nine states; the match between the treated and synthetic control states is relatively poor as shown in Appendix Figures A1 through A6. Notably, if we construct difference-in-differences estimates using the treated and synthetic control states, estimates are very similar to the other difference-in-differences estimates. While the synthetic control approach does not produce a match that yields a zero difference in pre-2014 values between treated and synthetic control states, it does adequately match the trends in pre-2014 outcomes between treated and synthetic control states. Therefore, it yields difference-in-differences estimates that are quite similar to others.

In summary, estimates in Tables 3 through 5 indicate that the 2014 Medicaid expansions significantly increased Medicaid coverage and decreased the proportion of persons uninsured.[17] However, magnitudes of estimates were modest even among a relatively less educated group of adults.[18] The largest effect sizes were found for not married, childless adults; approximately 5% of this group gained Medicaid coverage and health insurance, as there was little substitution of private for public

[17] Estimates of the increase in Medicaid coverage in Table 3 are consistent with administrative data. According to a Kaiser Family Foundation report (Wachino et al. 2014), Medicaid enrollment increased by of 4.2 million persons between 2013 and 2014 in states that expanded Medicaid. Estimates in Table 3 imply an increase in Medicaid coverage of approximately 3 million low-educated adults ages 22 to 64. Note that the states examined in Table 3 differ somewhat from those in the Kaiser report and the sample in Table 3 is limited to a specific demographic group. See: https://kaiserfamilyfoundation.files.wordpress.com/2014/05/8584-how-is-the-aca-impacting-medicaid-enrollment2.pdf.

[18] Stratifying the sample further to those with less than a high school degree yields estimates that are generally equivalent to those for the combined sample of high school graduates and those with less than a high school degree.

insurance for this group. While these estimates of the effect of the 2014 Medicaid expansions are illustrative of the proportion of the sample "treated" as a result of the Medicaid expansion, it is important to note the following: that these are point estimates with confidence intervals that include a wider range of estimates; that health insurance is measured with some, perhaps considerable, error; and that there could be behavioral responses even among those who do not change insurance status, for example, those who were covered by Medicaid prior to expansion, but who increase work when income eligibility expansions increase. Yet, it is plausible to assume that no more than 10 percent of the sample was treated, which is relevant for interpreting estimates of the effect of the expansions on labor supply.

4.b. Estimates of the Effect of ACA Medicaid Expansions on Labor Supply—American Community Survey

Table 6 presents difference-in-differences estimates of the effect of the 2014 Medicaid expansion on labor supply measures using data from the ACS. The table is organized in the same way as previous tables.[19] Three measures of labor supply are examined: employed at time of interview, usual hours worked per week in last year, and whether a person worked 30 or more hours per week.

Estimates in the top panel of Table 6, which pertain to the sample of parents with a high school education or less, are all positive, and two are statistically significant. All estimates are also quite small (relative to the mean) too. Overall, there is limited evidence that the 2014 Medicaid expansion affected employment. At most, there is some indication that the 2014 expansions increased labor supply by approximately 2 percentage points (10%) for not married parents, in states that had prior expansions. This finding is consistent with the fact that most prior expansions were targeted at parents and that this group is most likely to be on Medicaid prior to expansions (see Table 3). Therefore, the increase in income eligibility thresholds provides an incentive to increase work effort among this group. In Appendix Table 5, we obtain estimates using samples stratified by age, and the positive effect of the Medicaid expansions on employment is concentrated among unmarried, parents in the 45 to 64 age group.

[19] Appendix Table 3 presents results for the pooled sample of parents and childless adults.

The bottom panel of Table 6 shows estimates for the childless sample. Here we observe a very consistent, positive effect of the Medicaid expansions on all three labor supply measures, but none of the estimates are statistically significant. All are also small (e.g., less than 1 percentage point).

To assess the validity of the difference-in-differences research design, we present event history estimates in Table 7 that correspond to the estimates in Table 6. For the sample of parents (top panel), estimates corresponding to the pre-2014 interactions between the treatment indicator and year dummy variables are not significant except in one case, and estimates are relatively small (e.g., less than 1 percentage point in the case of employment). These findings suggest that in the case of parents, the difference-in-differences research design is plausibly valid. However, for the childless adult sample, estimates in Table 7 indicate that the difference-in-differences design may be problematic, as there are several statistically significant (and marginally significant) estimates associated with the pre-2014 interactions between the treatment indicator and the year dummy variables. However, the significant estimates are small.

The potentially problematic difference-in-differences research design, particularly for childless adults, suggests that greater weight should be placed on estimates from the synthetic control approach. Evidence of the validity of the synthetic control approach for labor supply outcomes is found in Figures 7 through 12, which illustrate that treated and control states had very similar trends for labor supply measures pre-2014. Table 8 presents the synthetic control estimates and also includes estimates from Table 6 for comparison. Synthetic control estimates in the top panel of Table 8, which are for parents, indicate that the 2014 expansions had no significant effect on labor supply. All estimates are quite small and none are statistically significant. These estimates are generally consistent with estimates in Table 6 for this group, which revealed only limited evidence that the 2014 expansions affected labor supply of parents.[20]

Estimates in the bottom panel of Table 8 also suggest that the 2014 expansions had little effect on the labor supply of childless adults. None of the estimates are statistically significant and most are quite

[20] Synthetic control estimates that use the alternative approach to constructing weights that uses the 2010 to 2013 average value of the dependent variable and the 2013 value are very similar to those reported in Table 8.

small. The largest estimates are 0.007 and 0.008 for the probability of being employed and the probability of working 30 or more hours, respectively, for the not married group of childless adults. These synthetic control estimates are quite similar to the difference-in-differences estimates in Table 6. Therefore, despite some evidence of a less than perfect difference-in-differences research design, estimates from both of the approaches indicate that the Medicaid expansions had little effect on labor supply of childless adults. Moreover, the synthetic control approach has considerable internal validity as suggested by Figures 7 through 12.

Finally, we also obtained difference-in-differences and synthetic control estimates using a sample that omitted the nine control states with prior Medicaid expansions. These estimates along with corresponding estimates from Tables 6 and 8 are in Appendix Table 6.[21] There is only one difference to note. Among unmarried, childless adults, synthetic control estimates suggest an increase in employment of between 1 and 1.5 percentage points, which is slightly larger than estimates in Table 8.
Overall, estimates in Tables 6 through 8 suggest that the 2014 expansions did not have a substantial effect on the labor supply of low-educated adults. If anything, the Medicaid expansions are associated with a small (1 to 2 percentage point) increase in employment among unmarried, low-educated persons.

4.c. Estimates of the Effect of ACA Medicaid Expansions on Labor Supply—Current Population Survey

We also examined the effect of Medicaid expansions on labor supply using data from the Current Population Survey (CPS). One advantage of the CPS is that it extends through most of 2015 (through November), which allows for a longer assessment of the effect of the ACA Medicaid expansions. Difference-in-differences estimates of the effect of the expansions are in Table 9, which is for the parent sample, and Table 10, which is for the childless adult sample. For these analyses, we present estimates only for one indicator of treatment that combines states that expanded regardless of whether they had a

[21] Append Figures A7 through A12 provide evidence of the validity of the synthetic control approach for the sample that omits the nine control states. In contrast to the health insurance outcomes, for labor supply outcomes the match between treated and synthetic control states is very good.

prior expansion. This is consistent with the previous evidence presented that showed that there was little difference between these two groups of states in terms of effects of the expansion. Tables 9 and 10 are in a slightly different format than previous tables and contain both difference-in-differences estimates and event history estimates. The difference-in-differences estimates are in the top row (panel) of each table and the event history estimates are in the bottom row (panel).

Estimates in Table 9 suggest that among not married, parents, the Medicaid expansions increased employment significantly by 2 percentage points, or 3%. This is a somewhat larger effect than that found in the ACS analyses (Table 6), which was 1 percentage point. However, as the event history estimates reveal, there is some evidence that the difference-in-difference research design may not be valid for this group, as estimates associated with pre-2014 interactions between the treatment indicator and year dummy variables are sometimes significant and similar in magnitude to the difference-in-differences estimate, particularly for the sample of unmarried, parents. In Table 10, which is for the sample of childless adults, estimates indicate that the ACA Medicaid expansions had a positive effect on work effort, but with one exception, none of the estimates are statistically significant. In this case, estimates are larger (more positive) than those obtained from the ACS (Table 6). Event history estimates also indicate potential problems with the difference-in-differences design for this sample that merits consideration when drawing inferences.

Estimates from the synthetic control approach that use CPS data are shown in Table 11 (top row of each panel). We also show the difference-in-differences estimates from Tables 9 and 10 for comparison (bottom row of each panel). Given the evidence that the difference-in-differences design may not be as valid as desired, the synthetic control estimates may be preferred. The first point to note about Table 11 is that difference-in-differences and synthetic control estimates differ somewhat. For parents, the synthetic control estimates of the effect of Medicaid on labor supply are all negative and not statistically significant. For childless adults, synthetic control estimates are mixed in sign, mostly small in magnitude and not statistically significant.

4.d. Summary of Estimates of the Effect of ACA Medicaid Expansions on Labor Supply

To summarize, we find that the 2014 Medicaid expansions did not have substantial effects on the labor supply of low-educated persons in the US. This finding is consistent with the modest effect of the expansions on the health insurance coverage (Table 3 through 5). It is remarkable, however, that most estimates were positive, although relatively small. The only exception was the synthetic control estimates obtained using the CPS data, which varied more in sign.

One question is whether estimates in Tables 6 through 11 differ from those in recent studies on the effect of Medicaid on labor supply. Consider the results from the Oregon study (Baicker et al. 2013): among childless adults, obtaining Medicaid was associated with a 1.6 percentage point (3%) decrease in employment. This is a treated-on-treated (TOT) estimate. In our analysis, for childless adults we find effects of the 2014 expansion on employment of between -0.0003 (synthetic control) and 0.003 (difference-in-differences) using data form the ACS and 0.004 and 0.01 using data from the CPS. Focusing on the smallest (most negative) estimate and using a standard error of 0.003 (from difference-in-differences estimate), we cannot rule out with 95% confidence an effect of -0.0057.

This estimate of -0.0057 is an intention-to-treat (ITT) effect. If we scaled this ITT estimate by the proportion of the sample "treated", for example, as measured by the change in Medicaid coverage in Table 3, we obtain a crude, treatment-on-treated (TOT) estimate of -0.14 (-0.0057/0.042). This is considerably larger than the estimate in the Oregon and Wisconsin studies. However, these calculations should be interpreted with substantial caution given the crudeness of the calculations. For example, the upper value of the confidence interval of the estimate of the effect of the 2014 expansion on Medicaid coverage of childless adults is approximately 6 percentage points. If we used this estimate as the amount of "treatment" we would obtain implied TOT estimates between -0.095. In addition, it is unclear that the change in Medicaid is the appropriate measure to use to scale the ITT estimate because this is not necessarily the correct measure of treatment. The proportion "treated" may be much higher, plausibly 10

percent, and, as just shown, small increases in the proportion of the sample treated implies substantial reductions in implied TOT effects. The bottom line is that we can rule out large negative effects of Medicaid on labor supply such as those in Garthwaite et al. (2014) and in the upper range of estimates from the Wisconsin study. Moreover, most of our point estimates are positive suggesting that, if anything, Medicaid increased labor supply.

5. Conclusions

The Affordable Care Act (ACA) became law in 2010 when the unemployment rate in the U.S. was just under 10% and at a 30-year high, and the economy was just coming out of the Great Recession. With this backdrop, it is understandable that the potential work disincentives of the ACA garnered considerable public attention. Specifically, the expansion of Medicaid income eligibility thresholds and the formation of the health insurance marketplaces that provided income-based subsidies created incentives for people to alter their labor supply. Moreover, most of the incentives generated by the ACA were likely to reduce work effort.

In this paper, we examined whether the expansions in Medicaid affected labor supply of persons with a high school education or less, which is a group likely to be affected by the expansions because of their relatively low income and earnings potential. We first measured the effect of the Medicaid expansions on health insurance coverage to assess the extent of the "treatment" engendered by the expansions. Estimates indicate that the Medicaid expansions increased the proportion of the sample covered by Medicaid by approximately 4 percentage points and decreased the proportion uninsured by a similar, perhaps slightly lower amount because of some switching between private insurance and Medicaid. There was some variation in effects by demographic groups with larger changes in Medicaid coverage and proportion uninsured observed for unmarried, childless adults.

Estimates of the effect of Medicaid on labor supply were, in general, relatively small and not statistically significant. In fact, most estimates of the effect of the Medicaid expansions on labor supply

were positive. Overall, there was very little evidence that the Medicaid expansions decreased work effort. Moreover, confidence intervals associated with estimates rule out large behavioral (TOT) responses.

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Table 1. Classification of States into Treatment and Control Groups

Control Groups			
No Expansion in 2014 No Prior Expansion		No Expansion in 2014 Prior Limited Expansions for Parents and/or Childless Adults	Expansion in 2014 Prior Full Expansions for Parents and Childless Adults
Alabama	Nebraska	Indiana	Delaware
Alaska	North Carolina	Maine	Washington, D.C.
Florida	Oklahoma	Tennessee	Massachusetts
Georgia	Pennsylvania	Wisconsin	New York
Idaho	South Carolina		Vermont
Kansas	South Dakota		
Louisiana	Texas		
Mississippi	Utah		
Missouri	Virginia		
Montana			

Treatment Groups	
Expansion 2014 No Prior Expansion	Expansion 2014 Prior Expansions for Parents and/or Childless Adults
Arkansas	Arizona
Kentucky	California
Michigan	Connecticut
Nevada	Colorado
New Hampshire	Hawaii
New Mexico	Illinois
North Dakota	Iowa
Ohio	Maryland
West Virginia	Minnesota
	New Jersey
	Oregon
	Rhode Island
	Washington

Table 2. Descriptive Statistics for 2010 from American Community Survey and Current Population Survey

Outcomes and Controls	ACS	CPS
Medicaid	0.11	N/A
Uninsured	0.30	N/A
Private	0.60	N/A
Employed at time of Survey	0.69	0.67
Usual Hours Worked per Week	27.3	26.3
	(20.5)	(20.6)
Works more than 30 hours per Week	0.61	0.60
Age	43.9	43.2
	(12.0)	(12.02)
Male	0.52	0.51
Non-Hispanic White	0.62	0.62
Non-Hispanic Black	0.11	0.12
Hispanic	0.21	0.21
Other Race	0.06	0.06
Married	0.60	0.58
Divorced or Separated	0.16	0.15
Never Married	0.22	0.24
Widowed	0.02	0.02
Foreign Born	0.22	0.20
U.S. Citizenship	0.86	0.86
High School Educated	0.73	0.76
Has Children under age 18	0.35	0.37
Number of Children	0.92	0.71
	(1.22)	(1.12)
Family Size	3.09	3.32
	(1.80)	(1.75)
Observations	529,509	321,171

Data from 2010 American Community Survey and Current Population Survey monthly files. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Standard deviations for continuous variables presented in parenthesis.

Table 3. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Health Insurance
American Community Survey

	Medicaid			Uninsured			Private		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	0.040**	0.039**	0.041**	-0.027**	-0.027**	-0.024**	-0.011	-0.009	-0.019**
	(0.008)	(0.009)	(0.009)	(0.011)	(0.012)	(0.011)	(0.007)	(0.008)	(0.006)
Expand in 2014, no prior policy	0.045**	0.040**	0.056**	-0.029**	-0.023	-0.049**	-0.011	-0.012	-0.008
	(0.013)	(0.013)	(0.018)	(0.013)	(0.012)	(0.019)	(0.009)	(0.009)	(0.011)
Expand in 2014, any prior policy	0.039**	0.039**	0.035**	-0.026	-0.029	-0.015	-0.011	-0.007	-0.024**
	(0.010)	(0.011)	(0.010)	(0.014)	(0.015)	(0.012)	(0.008)	(0.009)	(0.006)
p-value for test of difference between treatment effects	0.712	0.953	0.283	0.845	0.733	0.103	0.972	0.549	0.153
Number of Observations	857486	655254	202232	857486	655254	202232	857486	655254	202232
Mean of Dep. Variable in 2010	0.168	0.129	0.303	0.282	0.265	0.355	0.560	0.620	0.355
Childless Adults									
Expand in 2014	0.039**	0.024**	0.052**	-0.034**	-0.022	-0.044**	-0.003	-0.001	-0.007
	(0.007)	(0.007)	(0.007)	(0.009)	(0.011)	(0.007)	(0.006)	(0.007)	(0.006)
Expand in 2014, no prior policy	0.035**	0.019**	0.052**	-0.028**	-0.012	-0.046**	-0.006	-0.006	-0.005
	(0.009)	(0.008)	(0.009)	(0.007)	(0.006)	(0.008)	(0.006)	(0.005)	(0.008)
Expand in 2014, any prior policy	0.040**	0.026**	0.052**	-0.037**	-0.026	-0.043**	-0.002	0.001	-0.007
	(0.009)	(0.008)	(0.009)	(0.012)	(0.014)	(0.009)	(0.006)	(0.008)	(0.006)
p-value for test of difference between treatment effects	0.637	0.488	0.992	0.484	0.328	0.834	0.536	0.334	0.683
Number of Observations	1718309	855016	863293	1718309	855016	863293	1718309	855016	863293
Mean of Dep. Variable in 2010	0.073	0.038	0.108	0.305	0.191	0.421	0.614	0.763	0.462

Data from 2010-2014 American Community Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2014. Estimates below dashed lines also report coefficients on these interaction terms, but distinguishes between states which had no prior Medicaid policy and those that had any prior policy (except for those that had ACA-level Medicaid expansions prior to 2014). A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different between states that had prior policies and those that did not. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Table 4. Event History Estimates of Effect of ACA Medicaid Expansions on Health Insurance Outcomes
American Community Survey

	Medicaid			Uninsured			Private		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014 x year 2014	0.040**	0.041**	0.035**	-0.026**	-0.030**	-0.013	-0.011	-0.007	-0.024**
	(0.010)	(0.011)	(0.010)	(0.012)	(0.014)	(0.012)	(0.009)	(0.009)	(0.008)
Expand in 2014 x year 2013	-0.0002	0.003	-0.013	0.004	-0.0002	0.020**	-0.002	-0.001	-0.005
	(0.006)	(0.006)	(0.007)	(0.005)	(0.005)	(0.009)	(0.004)	(0.004)	(0.007)
Expand in 2014 x year 2012	0.001	0.002	-0.002	-0.002	-0.005	0.011	0.001	0.005	-0.010
	(0.005)	(0.005)	(0.008)	(0.004)	(0.005)	(0.008)	(0.003)	(0.003)	(0.006)
Expand in 2014 x year 2011	-0.001	0.002	-0.012	-0.0005	-0.004	0.014	0.0004	0.002	-0.005
	(0.004)	(0.004)	(0.007)	(0.004)	(0.005)	(0.008)	(0.003)	(0.004)	(0.005)
p-value test of joint significance of pre-2014 interactions	0.871	0.948	0.037	0.374	0.393	0.136	0.766	0.276	0.494
Number of Observations	857486	655254	202232	857486	655254	202232	857486	655254	202232
Mean of Dep. Variable in 2010	0.168	0.129	0.303	0.282	0.265	0.355	0.560	0.620	0.355
Childless Adults									
Expand in 2014 x year 2014	0.039**	0.024**	0.052**	-0.037**	-0.022	-0.050**	-0.001	-0.001	0.001
	(0.008)	(0.007)	(0.009)	(0.010)	(0.012)	(0.008)	(0.006)	(0.008)	(0.006)
Expand in 2014 x year 2013	0.002	0.001	0.001	-0.004	0.002	-0.008	0.001	-0.004	0.006
	(0.003)	(0.002)	(0.005)	(0.004)	(0.004)	(0.006)	(0.003)	(0.004)	(0.004)
Expand in 2014 x year 2012	-0.001	-0.001	-0.002	-0.004	-0.002	-0.004	0.004	0.002	0.006
	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)	(0.005)	(0.002)	(0.003)	(0.003)
Expand in 2014 x year 2011	0.001	0.0005	0.001	-0.006**	-0.0001	-0.011**	0.005**	-0.0001	0.011**
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)	(0.003)
p-value test of joint significance of pre-2014 interactions	0.303	0.420	0.566	0.156	0.505	0.035	0.060	0.212	0.010
Number of Observations	1718309	855016	863293	1718309	855016	863293	1718309	855016	863293
Mean of Dep. Variable in 2010	0.073	0.038	0.108	0.305	0.191	0.421	0.614	0.763	0.462

Data from 2010-2014 American Community Survey. Estimates report coefficient on interaction term between an indicator for whether state expands Medicaid and year indicators. A p-value reports results from F-tests of joint significance from pre-2014 Medicaid expansion interaction terms. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Table 5. Synthetic Control Estimates of Effect of ACA Medicaid Expansions on Health Insurance American Community Survey

	Medicaid			Uninsured			Private		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	0.033**	0.026**	0.045**	-0.031**	-0.032**	-0.033	-0.002	0.002	-0.008
(p-value)	(0.017)	(0.038)	(0.053)	(0.001)	(0.001)	(0.082)	(0.581)	(0.811)	(0.484)
Difference-in-difference Estimates (From Table 3)	0.040**	0.039**	0.041**	-0.027**	-0.027**	-0.024**	-0.011	-0.009	-0.019**
	(0.008)	(0.009)	(0.009)	(0.011)	(0.012)	(0.011)	(0.007)	(0.008)	(0.006)
Number of Observations	857486	655254	202232	857486	655254	202232	857486	655254	202232
Mean of Dep. Variable in 2010	0.168	0.129	0.303	0.282	0.265	0.355	0.560	0.620	0.355
Childless Adults									
Expand in 2014	0.038**	0.023**	0.049**	-0.035**	-0.024**	-0.041**	0.006	0.006	0.006
(p-value)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.302)	(0.457)	(0.444)
Difference-in-difference Estimates (From Table 3)	0.039**	0.024**	0.052**	-0.034**	-0.022	-0.044**	-0.003	-0.001	-0.007
	(0.007)	(0.007)	(0.007)	(0.009)	(0.011)	(0.007)	(0.006)	(0.007)	(0.006)
Number of Observations	1718309	855016	863293	1718309	855016	863293	1718309	855016	863293
Mean of Dep. Variable in 2010	0.073	0.038	0.108	0.305	0.191	0.421	0.614	0.763	0.462

Data from 2010-2014 American Community Survey. Estimates report difference in outcomes in 2014 between treatment states and synthetic control group. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. P-values of synthetic control estimates obtained through randomization inference in parentheses. (**) indicates significance at the 5 percent level.

Table 6. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
American Community Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	0.005	0.003	0.011	0.217	0.129	0.477	0.007**	0.004	0.014**
	(0.004)	(0.003)	(0.007)	(0.134)	(0.130)	(0.244)	(0.003)	(0.003)	(0.006)
Expand in 2014, no prior policy	0.002	0.001	0.003	0.131	0.140	0.128	0.002	0.002	0.003
	(0.005)	(0.005)	(0.009)	(0.281)	(0.246)	(0.443)	(0.006)	(0.005)	(0.010)
Expand in 2014, any prior policy	0.006	0.003	0.014	0.248	0.125	0.616**	0.008**	0.005	0.018**
	(0.004)	(0.004)	(0.007)	(0.129)	(0.136)	(0.252)	(0.003)	(0.003)	(0.007)
p-value for test of difference between treatment effects	0.507	0.731	0.288	0.686	0.955	0.304	0.372	0.612	0.206
Number of Observations	857486	655254	202232	857486	655254	202232	857486	655254	202232
Mean of Dep. Variable in 2010	0.715	0.726	0.676	28.4	29.3	25.6	0. 636	0.651	0.584
Childless Adults									
Expand in 2014	0.003	0.003	0.002	0.191	0.233	0.148	0.006	0.006	0.005
	(0.003)	(0.003)	(0.004)	(0.146)	(0.143)	(0.179)	(0.003)	(0.003)	(0.004)
Expand in 2014, no prior policy	0.002	0.0005	0.004	0.185	0.181	0.186	0.005	0.003	0.006
	(0.006)	(0.006)	(0.006)	(0.282)	(0.293)	(0.304)	(0.006)	(0.006)	(0.007)
Expand in 2014, any prior policy	0.003	0.004	0.002	0.194	0.258	0.133	0.006**	0.007**	0.005
	(0.003)	(0.003)	(0.004)	(0.137)	(0.136)	(0.177)	(0.003)	(0.003)	(0.004)
p-value for test of difference between treatment effects	0.910	0.525	0.685	0.974	0.794	0.855	0.860	0.591	0.867
Number of Observations	1718309	855016	863293	1718309	855016	863293	1718309	855016	863293
Mean of Dep. Variable in 2010	0.677	0.688	0.667	26.8	27.5	26.1	0.602	0.614	0.591

Data from 2010-2014 American Community Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2014. Estimates below dashed lines also report coefficients on these interaction terms, but distinguishes between states which had no prior Medicaid policy and those that had any prior policy (except for those that had ACA-level Medicaid expansions prior to 2014). A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different between states that had prior policies and those that did not. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Table 7. Event History Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
American Community Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Work 30 or More Hours per Week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014 x year 2014	0.007	0.005	0.016	0.330	0.197	0.780**	0.010**	0.007	0.021**
	(0.005)	(0.004)	(0.010)	(0.190)	(0.191)	(0.342)	(0.004)	(0.004)	(0.009)
Expand in 2014 x year 2013	0.006	0.006	0.008	0.230	0.207	0.362	0.008**	0.007	0.012
	(0.003)	(0.003)	(0.008)	(0.158)	(0.161)	(0.274)	(0.004)	(0.004)	(0.007)
Expand in 2014 x year 2012	0.004	0.004	0.009	0.262	0.203	0.512	0.005	0.004	0.009
	(0.003)	(0.003)	(0.007)	(0.135)	(0.160)	(0.262)	(0.003)	(0.003)	(0.007)
Expand in 2014 x year 2011	-0.001	-0.002	0.005	-0.026	-0.121	0.344	-0.0001	-0.002	0.008
	(0.003)	(0.003)	(0.007)	(0.117)	(0.146)	(0.208)	(0.003)	(0.003)	(0.006)
p-value test of joint significance of pre-2014 interactions	0.374	0.443	0.510	0.720	0.871	0.382	0.585	0.371	0.657
Number of Observations	857486	655254	202232	857486	655254	202232	857486	655254	202232
Mean of Dep. Variable in 2010	0.715	0.726	0.676	28.443	29.282	25.567	0. 636	0.651	0.584
Childless Adults									
Expand in 2014 x year 2014	0.006	0.007	0.005	0.346	0.378	0.331	0.009	0.008	0.010
	(0.004)	(0.004)	(0.006)	(0.228)	(0.205)	(0.284)	(0.005)	(0.004)	(0.006)
Expand in 2014 x year 2013	0.007**	0.008**	0.007	0.300	0.282	0.343	0.007	0.007	0.009
	(0.004)	(0.004)	(0.005)	(0.179)	(0.180)	(0.226)	(0.004)	(0.004)	(0.006)
Expand in 2014 x year 2012	0.004	0.008**	0.001	0.159	0.223	0.120	0.003	0.004	0.002
	(0.003)	(0.003)	(0.005)	(0.165)	(0.123)	(0.228)	(0.004)	(0.003)	(0.005)
Expand in 2014 x year 2011	0.002	0.001	0.004	0.163	0.081	0.267**	0.003	-0.001	0.008**
	(0.002)	(0.003)	(0.003)	(0.099)	(0.125)	(0.127)	(0.002)	(0.003)	(0.003)
p-value test of joint significance of pre-2014 interactions	0.214	0.002	0.246	0.242	0.297	0.041	0.188	0.133	0.018
Number of Observations	1718309	855016	863293	1718309	855016	863293	1718309	855016	863293
Mean of Dep. Variable in 2010	0.677	0.688	0.667	26.772	27.486	26.0461	0.602	0.614	0.591

Data from 2010-2014 American Community Survey. Estimates report coefficient on interaction term between an indicator for whether state expands Medicaid and year indicators. A p-value reports results from F-tests of joint significance from pre-2014 Medicaid expansion interaction terms. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Table 8. Synthetic Control Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
American Community Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	0.004	0.006	0.003	-0.021	-0.036	0.003	0.003	0.005	0.006
(p-value)	(0.766)	0.399)	(0.839)	(0.953)	(0.902)	(0.993)	(0.463)	(0.258)	(0.359)
Difference-in-difference	0.005	0.003	0.011	0.217	0.129	0.477	0.007**	0.004	0.014**
Estimates (From Table 6)	(0.004)	(0.003)	(0.007)	(0.134)	(0.130)	(0.244)	(0.003)	(0.003)	(0.006)
Number of Observations	857486	655254	202232	857486	655254	202232	857486	655254	202232
Mean of Dep. Variable in 2010	0.715	0.726	0.676	28.4	29.3	25.6	0. 636	0.651	0.584
Childless Adults									
Expand in 2014	-0.0003	0.0001	0.007	-0.015	0.284	0.334	0.004	0.008	0.008
(p-value)	(0.960)	(0.992)	(0.361)	(0.974)	(0.436)	(0.388)	(0.254)	(0.156)	(0.148)
Difference-in-difference	0.003	0.003	0.002	0.191	0.233	0.148	0.006	0.006	0.005
Estimates (From Table 6)	(0.003)	(0.003)	(0.004)	(0.146)	(0.143)	(0.179)	(0.003)	(0.003)	(0.004)
Number of Observations	1718309	855016	863293	1718309	855016	863293	1718309	855016	863293
Mean of Dep. Variable in 2010	0.677	0.688	0.667	26.8	27.5	26.1	0.602	0.614	0.591

Data from 2010-2014 American Community Survey. Estimates report difference in outcomes in 2014 between treatment states and synthetic control group. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. P-values of synthetic control estimates obtained through randomization inference in parentheses. (**) indicates significance at the 5 percent level.

Table 9. Difference-in-differences and Event History Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
Current Population Survey
Parent Sample

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand x POST	0.002	-0.004	0.020**	0.017	-0.160	0.509	0.003	-0.001	0.015
	(0.005)	(0.005)	(0.008)	(0.223)	(0.249)	(0.359)	(0.006)	(0.006)	(0.008)
Expand x year2015	0.008	-0.005	0.042**	0.185	-0.233	1.308**	0.009	-0.0004	0.035**
	(0.006)	(0.008)	(0.012)	(0.332)	(0.381)	(0.579)	(0.008)	(0.009)	(0.014)
Expand x year2014	0.004	-0.005	0.029**	0.277	-0.143	1.437**	0.008	-0.005	0.041**
	(0.007)	(0.008)	(0.013)	(0.290)	(0.327)	(0.479)	(0.006)	(0.007)	(0.011)
Expand x year2013	0.007	0.002	0.022	0.291	0.002	1.123**	0.010	0.004	0.029**
	(0.007)	(0.009)	(0.011)	(0.313)	(0.362)	(0.509)	(0.007)	(0.008)	(0.013)
Expand x year2012	0.008	0.002	0.024	0.497	0.124	1.457**	0.012	0.002	0.039**
	(0.008)	(0.009)	(0.013)	(0.374)	(0.405)	(0.561)	(0.008)	(0.009)	(0.014)
Expand x year2011	-0.00002	-0.008	0.019	0.094	-0.293	1.050**	0.001	-0.010	0.026**
	(0.006)	(0.007)	(0.011)	(0.289)	(0.311)	(0.432)	(0.007)	(0.007)	(0.011)
p-value test of joint significance of pre-2014 interactions	0.418	0.287	0.213	0.269	0.258	0.063	0.124	0.118	0.056
Number of Observations	609919	438098	171821	609919	438098	171821	609919	438098	171821
Mean of Dep. Variable in 2010	0.686	0.706	0.628	27.2	28.3	23.9	0.616	0.640	0.550

Data from 2010-2015 Current Population Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and whether time period is after date of expansion. Estimates below dashed lines report event history analysis. A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different from 0 in pre-expansion periods. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Table 10. Difference-in-differences and Event History Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
Current Population Survey
Childless Adult Sample

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Childless Adults	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand x POST	0.010**	0.012	0.009	0.317	0.373	0.341	0.007	0.010	0.006
	(0.005)	(0.006)	(0.006)	(0.210)	(0.261)	(0.282)	(0.005)	(0.006)	(0.007)
Expand x year2015	0.010	0.011	0.013	0.252	0.273	0.408	0.008	0.008	0.012
	(0.008)	(0.008)	(0.010)	(0.338)	(0.378)	(0.446)	(0.008)	(0.008)	(0.011)
Expand x year2014	0.002	-0.008	0.015	0.002	-0.269	0.407	0.002	-0.004	0.011
	(0.007)	(0.008)	(0.010)	(0.303)	(0.363)	(0.422)	(0.007)	(0.008)	(0.010)
Expand x year2013	-0.006	-0.016	0.007	-0.294	-0.569	0.129	-0.003	-0.011	0.008
	(0.006)	(0.008)	(0.009)	(0.255)	(0.355)	(0.363)	(0.006)	(0.008)	(0.009)
Expand x year2012	-0.011	-0.021**	0.002	-0.449	-0.730**	-0.083	-0.007	-0.016**	0.004
	(0.005)	(0.007)	(0.008)	(0.252)	(0.344)	(0.360)	(0.005)	(0.007)	(0.009)
Expand x year2011	-0.007	-0.017**	0.004	-0.341	-0.625**	-0.030	-0.007	-0.015**	0.002
	(0.004)	(0.005)	(0.007)	(0.190)	(0.266)	(0.302)	(0.005)	(0.006)	(0.007)
p-value test of joint significance of pre-2014 interactions	0.233	0.004	0.791	0.279	0.125	0.907	0.485	0.087	0.821
Number of Observations	1083042	521890	561152	1083042	521890	561152	1083042	521890	561152
Mean of Dep. Variable in 2010	0.652	0.669	0.636	25.8	26.8	24.9	0.587	0.605	0.569

Data from 2010-2015 Current Population Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and whether time period is after date of expansion. Estimates below dashed lines report event history analysis. A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different from 0 in pre-expansion periods. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Table 11. Synthetic Control Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
Current Population Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand x POST	-0.008	-0.009	-0.013	-0.500	-0.553	-0.719	-0.005	-0.007	-0.018
(p-value)	(0.437)	(0.396)	(0.413)	(0.235)	(0.268)	(0.290)	(0.308)	(0.294)	(0.133)
Difference-in-difference	0.002	-0.004	0.020**	0.017	-0.160	0.509	0.003	-0.001	0.015
Estimates (From Table 9)	(0.005)	(0.005)	(0.008)	(0.223)	(0.249)	(0.359)	(0.006)	(0.006)	(0.008)
Number of Observations	609919	438098	171821	609919	438098	171821	609919	438098	171821
Mean of Dep. Variable in 2010	0.686	0.706	0.628	27.2	28.3	23.9	0.616	0.640	0.550
Childless Adults									
Expand x POST	0.004	0.016	0.002	0.194	0.699	-0.146	-0.001	0.013	-0.004
(p-value)	(0.607)	(0.116)	(0.913)	(0.565)	(0.116)	(0.826)	(0.447)	(0.130)	(0.445)
Difference-in-difference	0.010**	0.012	0.009	0.317	0.373	0.341	0.007	0.010	0.006
Estimates (From Table 10)	(0.005)	(0.006)	(0.006)	(0.210)	(0.261)	(0.282)	(0.005)	(0.006)	(0.007)
Number of Observations	1083042	521890	561152	1083042	521890	561152	1083042	521890	561152
Mean of Dep. Variable in 2010	0.652	0.669	0.636	25.8	26.8	24.9	0.587	0.605	0.569

Data from 2010-2015 Current Population Survey. Estimates report difference in outcomes after 2014 between treatment states and synthetic control group. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. P-values of synthetic control estimates obtained through randomization inference in parentheses. (**) indicates significance at the 5 percent level.

Appendix Table 1. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Health Insurance
Pooled Sample of Parents and Childless Adults
American Community Survey

	Medicaid			Uninsured			Private		
Parents and Childless Adults	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	0.039**	0.030**	0.050**	-0.031**	-0.023**	-0.040**	-0.006	-0.004	-0.009
	(0.007)	(0.008)	(0.007)	(0.009)	(0.011)	(0.007)	(0.006)	(0.007)	(0.005)
Expand in 2014, no prior policy	0.038**	0.027**	0.053**	-0.028**	-0.016	-0.046**	-0.008	-0.008	-0.005
	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.007)	(0.007)	(0.008)
Expand in 2014, any prior policy	0.039**	0.032**	0.049**	-0.032**	-0.027	-0.038**	-0.006	-0.003	-0.011
	(0.008)	(0.009)	(0.008)	(0.012)	(0.014)	(0.009)	(0.006)	(0.008)	(0.005)
p-value for test of difference between treatment effects	0.927	0.720	0.758	0.771	0.482	0.523	0.702	0.382	0.486
Number of Observations	2575795	1510270	1065525	2575795	1510270	1065525	2575795	1510270	1065525
Mean of Dep. Variable in 2010	0.106	0.079	0.146	0.299	0.226	0.408	0.595	0.699	0.441

Data from 2010-2014 American Community Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2014. Estimates below dashed lines also report coefficients on these interaction terms, but distinguishes between states which had no prior Medicaid policy and those that had any prior policy (except for those that had ACA-level Medicaid expansions prior to 2014). A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different between states that had prior policies and those that did not. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Appendix Table 2. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Health Insurance By Age
American Community Survey

	Medicaid			Uninsured			Private		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Age 22 to 44									
Expand in 2014	0.044**	0.044**	0.041**	-0.030**	-0.031**	-0.028**	-0.011	-0.009	-0.016**
	(0.008)	(0.008)	(0.010)	(0.010)	(0.012)	(0.011)	(0.007)	(0.009)	(0.006)
Number of Observations	625684	461899	163785	625684	461899	163785	625684	461899	163785
Mean of Dep. Variable in 2010	0.186	0.141	0.324	0.315	0.297	0.367	0.518	0.582	0.325
Age 45 to 64									
Expand in 2014	0.030**	0.029**	0.037**	-0.018	-0.020	-0.008	-0.012	-0.008	-0.031**
	(0.010)	(0.011)	(0.010)	(0.014)	(0.015)	(0.013)	(0.008)	(0.009)	(0.012)
Number of Observations	231802	193355	38447	231802	193355	38447	231802	193355	38447
Mean of Dep. Variable in 2010	0.118	0.099	0.215	0.214	0.197	0.306	0.680	0.717	0.487
Childless Adults									
Age 22 to 44									
Expand in 2014	0.047**	0.036**	0.050**	-0.042**	-0.026**	-0.045**	-0.004	-0.009	-0.004
	(0.007)	(0.006)	(0.007)	(0.007)	(0.010)	(0.007)	(0.005)	(0.007)	(0.006)
Number of Observations	594085	133989	460096	594085	133989	460096	594085	133989	460096
Mean of Dep. Variable in 2010	0.092	0.052	0.104	0.472	0.346	0.511	0.438	0.603	0.386
Age 45 to 64	0.034**	0.022**	0.054**	-0.028**	-0.021	-0.041**	-0.004	-0.009	-0.004
Expand in 2014	(0.007)	(0.007)	(0.008)	(0.010)	(0.011)	(0.008)	(0.005)	(0.007)	(0.006)
Number of Observations	1124224	721027	403197	1124224	721027	403197	1124224	721027	403197
Mean of Dep. Variable in 2010	0.062	0.035	0.113	0.214	0.159	0.315	0.710	0.795	0.552

Data from 2010-2014 American Community Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2014. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Appendix Table 3. Comparison of Health Insurance Estimates With and Without Nine Control States (DE, DC, MA, NY, VT, IN, ME, TN and WI) American Community Survey

	Medicaid			Uninsured			Private		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Synthetic Control: Expand in 2014	0.056**	0.054**	0.103**	-0.052**	-0.059**	-0.097**	-0.0004	-0.009	0.021
(p-value)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.952)	(0.255)	(0.036)
Synthetic Control: Expand in 2014	0.033**	0.026**	0.045**	-0.031**	-0.032**	-0.033	-0.002	0.002	-0.008
(p-value) (From Table 5)	(0.017)	(0.038)	(0.053)	(0.001)	(0.001)	(0.082)	(0.581)	(0.811)	(0.484)
Difference-in-difference	0.041**	0.041**	0.036**	-0.020	-0.019	-0.018	-0.020**	-0.018**	-0.023**
Estimates	(0.008)	(0.008)	(0.009)	(0.011)	(0.012)	(0.011)	(0.006)	(0.007)	(0.006)
Difference-in-difference	0.040**	0.039**	0.041**	-0.027**	-0.027**	-0.024**	-0.011	-0.009	-0.019**
Estimates (From Table 3)	(0.008)	(0.009)	(0.009)	(0.011)	(0.012)	(0.011)	(0.007)	(0.008)	(0.006)
Number of Observations	729735	558069	171666	729735	558069	171666	729735	558069	171666
Mean of Dep. Variable in 2010	0.154	0.117	0.283	0.308	0.288	0.377	0.553	0. 610	0.352
Childless Adults									
Synthetic Control: Expand in 2014	0.053**	0.033**	0.074**	-0.048**	-0.028**	-0.065**	-0.011	-0.001	-0.0003
(p-value)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.079)	(0.871)	(0.977)
Synthetic Control: Expand in 2014	0.038**	0.023**	0.049**	-0.035**	-0.024**	-0.041**	0.006	0.006	0.006
(p-value) (From Table 5)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.302)	(0.457)	(0.444
Difference-in-difference	0.043**	0.028**	0.057**	-0.031**	-0.017	-0.043**	-0.010**	-0.008	-0.013**
Estimates	(0.006)	(0.006)	(0.006)	(0.009)	(0.011)	(0.007)	(0.005)	(0.007)	(0.004)
Difference-in-difference	0.039**	0.024**	0.052**	-0.034**	-0.022	-0.044**	-0.003	-0.001	-0.007
Estimates (From Table 3)	(0.007)	(0.007)	(0.007)	(0.009)	(0.011)	(0.007)	(0.006)	(0.007)	(0.006)
Number of Observations	1439047	713252	725795	1439047	713252	725795	1439047	713252	725795
Mean of Dep. Variable in 2010	0.065	0.033	0.097	0.320	0.201	0.440	0.606	0.756	0.453

Data from 2010-2014 American Community Survey. Estimates report difference in outcomes in 2014 between treatment states and synthetic control group. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. P-values of synthetic control estimates obtained through randomization inference in parentheses. (**) indicates significance at the 5 percent level.

Appendix Table 4. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
Pooled Sample of Parents and Childless Adults
American Community Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents and Childless Adults	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	0.003	0.003	0.004	0.200	0.186	0.200	0.006**	0.005	0.007
	(0.003)	(0.002)	(0.003)	(0.128)	(0.119)	(0.157)	(0.003)	(0.002)	(0.004)
Expand in 2014, no prior policy	0.002	0.001	0.004	0.165	0.166	0.162	0.004	0.003	0.005
	(0.005)	(0.005)	(0.007)	(0.271)	(0.251)	(0.315)	(0.006)	(0.005)	(0.007)
Expand in 2014, any prior policy	0.004	0.003	0.004	0.215	0.194	0.215	0.007**	0.006**	0.007**
	(0.002)	(0.002)	(0.003)	(0.115)	(0.112)	(0.147)	(0.002)	(0.002)	(0.003)
p-value for test of difference between treatment effects	0.718	0.590	0.975	0.852	0.913	0.862	0.656	0.590	0.810
Number of Observations	2575795	1510270	1065525	2575795	1510270	1065525	2575795	1510270	1065525
Mean of Dep. Variable in 2010	0.690	0.705	0.669	27.3	28.3	26.0	0.614	0.631	0.589

Data from 2010-2014 American Community Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2014. Estimates below dashed lines also report coefficients on these interaction terms, but distinguishes between states which had no prior Medicaid policy and those that had any prior policy (except for those that had ACA-level Medicaid expansions prior to 2014). A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different between states that had prior policies and those that did not. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Appendix Table 5. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes By Age
American Community Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Work 30 or More Hours per Week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Age 22 to 44									
Expand in 2014	0.005	0.004	0.009	0.167	0.076	0.428	0.005	0.003	0.012
	(0.003)	(0.003)	(0.006)	(0.148)	(0.142)	(0.257)	(0.003)	(0.003)	(0.007)
Number of Observations	625684	461899	163785	625684	461899	163785	625684	461899	163785
Mean of Dep. Variable in 2010	0.699	0.710	0.665	27.6	28.5	25.0	0.619	0.635	0.571
Age 45 to 64									
Expand in 2014	0.004	-0.0001	0.019	0.345	0.238	0.700	0.009	0.006	0.022
	(0.006)	(0.005)	(0.013)	(0.219)	(0.209)	(0.520)	(0.005)	(0.005)	(0.011)
Number of Observations	231802	193355	38447	231802	193355	38447	231802	193355	38447
Mean of Dep. Variable in 2010	0.761	0.767	0.728	30.8	31.3	28.2	0.684	0.693	0.641
Childless Adults									
Age 22 to 44									
Expand in 2014	0.003	0.001	0.003	0.191	-0.030	0.216	0.007	-0.0003	0.008
	(0.004)	(0.005)	(0.005)	(0.211)	(0.281)	(0.236)	(0.005)	(0.005)	(0.005)
Number of Observations	594085	133989	460096	594085	133989	460096	594085	133989	460096
Mean of Dep. Variable in 2010	0.697	0.761	0.677	27.4	30.9	26.3	0.621	0.695	0.597
Age 45 to 64									
Expand in 2014	0.002	0.004	0.0005	0.201	0.287**	0.053	0.005	0.007**	0.002
	(0.003)	(0.003)	(0.004)	(0.139)	(0.136)	(0.188)	(0.003)	(0.003)	(0.004)
Number of Observations	1124224	721027	403197	1124224	721027	403197	1124224	721027	403197
Mean of Dep. Variable in 2010	0.667	0.673	0.655	26.5	26.8	25.8	0.592	0.597	0.583

Data from 2010-2014 American Community Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2014. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Appendix Table 6. Comparison of Labor Supply Estimates With and Without Nine Control States (DE, DC, MA, NY, VT, IN, ME, TN and WI) American Community Survey

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Synthetic Control: Expand in 2014	0.0002	0.003	-0.011	-0.504	-0.464	-0.559	-0.005	0.001	-0.007
(p-value)	(0.965)	(0.751)	(0.415)	(0.124)	(0.155)	(0.328)	(0.270)	(0.454)	(0.322)
Synthetic Control: Expand in 2014	0.004	0.006	0.003	-0.021	-0.036	0.003	0.003	0.005	0.006
(p-value) (From Table 8)	(0.766)	0.399)	(0.839)	(0.953)	(0.902)	(0.993)	(0.463)	(0.258)	(0.359)
Difference-in-difference	0.006	0.003	0.015	0.217	0.073	0.635**	0.008**	0.005	0.017**
Estimates	(0.004)	(0.004)	(0.008)	(0.140)	(0.130)	(0.266)	(0.003)	(0.003)	(0.007)
Difference-in-difference	0.005	0.003	0.011	0.217	0.129	0.477	0.007**	0.004	0.014**
Estimates (From Table 6)	(0.004)	(0.003)	(0.007)	(0.134)	(0.130)	(0.244)	(0.003)	(0.003)	(0.006)
Number of Observations	729735	558069	171666	729735	558069	171666	729735	558069	171666
Mean of Dep. Variable in 2010	0.154	0.117	0.283	0.308	0.288	0.377	0.553	0. 610	0.352
Childless Adults									
Synthetic Control: Expand in 2014	-0.003	-0.001	0.010	-0.035	-0.061	0.447	0.002	0.006	0.015**
(p-value)	(0.657)	(0.870)	(0.166)	(0.911)	(0.833)	(0.251)	(0.358)	(0.195)	(0.026)
Synthetic Control: Expand in 2014	-0.0003	0.0001	0.007	-0.015	0.284	0.334	0.004	0.008	0.008
(p-value) (From Table 8)	(0.960)	(0.992)	(0.361)	(0.974)	(0.436)	(0.388)	(0.254)	(0.156)	(0.148)
Difference-in-difference	0.002	0.002	0.001	0.111	0.201	0.014	0.004	0.006	0.003
Estimates	(0.003)	(0.003)	(0.004)	(0.133)	(0.136)	(0.161)	(0.003)	(0.003)	(0.004)
Difference-in-difference	0.003	0.003	0.002	0.191	0.233	0.148	0.006	0.006	0.005
Estimates (From Table 6)	(0.003)	(0.003)	(0.004)	(0.146)	(0.143)	(0.179)	(0.003)	(0.003)	(0.004)
Number of Observations	1439047	713252	725795	1439047	713252	725795	1439047	713252	725795
Mean of Dep. Variable in 2010	0.065	0.033	0.097	0.320	0.201	0.440	0.606	0.756	0.453

Data from 2010-2014 American Community Survey. Estimates report difference in outcomes in 2014 between treatment states and synthetic control group. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. P-values of synthetic control estimates obtained through randomization inference in parentheses. (**) indicates significance at the 5 percent level.

Appendix Table 7. Difference-in-differences Estimates of Effect of ACA Medicaid Expansions on Labor Supply Outcomes
Current Population Sample, 2010-2013, 2015

	Employed at Time of Survey			Usual Hours Worked per Week			Worked 30 or more hours per week		
Parents	All	Married	Not Married	All	Married	Not Married	All	Married	Not Married
Expand in 2014	-0.005	-0.007	0.005	-0.790**	-0.830**	-0.442	-0.014	-0.016	-0.005
	(0.007)	(0.008)	(0.019)	(0.345)	(0.399)	(0.792)	(0.009)	(0.009)	(0.019)
Expand in 2014, no prior policy	-0.006	-0.006	-0.0002	-0.683	-0.554	-0.766	-0.019	-0.017	-0.017
	(0.010)	(0.015)	(0.024)	(0.453)	(0.597)	(1.071)	(0.015)	(0.016)	(0.032)
Expand in 2014, any prior policy	-0.005	-0.007	0.008	-0.838**	-0.949**	-0.289	-0.012	-0.015	0.001
	(0.009)	(0.009)	(0.021)	(0.413)	(0.439)	(0.858)	(0.009)	(0.009)	(0.020)
p-value for test of difference between treatment effects	0.933	0.939	0.737	0.770	0.523	0.670	0.692	0.911	0.599
Number of Observations	79436	57496	21940	79436	57496	21940	79436	57496	21940
Mean of Dep. Variable in 2010	0.690	0.714	0.623	27.2	28.5	23.5	0.616	0.634	0.541
Childless Adults									
Expand in 2014	0.013	0.009	0.016	0.018	-0.422	0.428	0.005	-0.0002	0.009
	(0.010)	(0.012)	(0.011)	(0.417)	(0.530)	(0.482)	(0.009)	(0.012)	(0.012)
Expand in 2014, no prior policy	0.026**	0.025	0.028	0.537	0.199	0.904	0.013	0.016	0.012
	(0.013)	(0.017)	(0.016)	(0.603)	(0.851)	(0.593)	(0.013)	(0.017)	(0.014)
Expand in 2014, any prior policy	0.006	0.0004	0.010	-0.244	-0.737	0.190	0.001	-0.008	0.008
	(0.011)	(0.014)	(0.012)	(0.421)	(0.534)	(0.516)	(0.009)	(0.013)	(0.013)
p-value for test of difference between treatment effects	0.138	0.158	0.274	0.170	0.259	0.210	0.322	0.181	0.779
Number of Observations	95365	46166	49199	95365	46166	49199	95365	46166	49199
Mean of Dep. Variable in 2010	0.688	0.701	0.676	27.2	28.0	26.5	0.626	0.639	0.613

Data from 2010-2013 and 2015 Current Population Survey. Estimates above dashed lines report coefficient on interaction term between an indicator for whether state expands Medicaid and an indicator for whether the year is 2015. Estimates below dashed lines also report coefficients on these interaction terms, but distinguishes between states which had no prior Medicaid policy and those that had any prior policy (except for those that had ACA-level Medicaid expansions prior to 2014). Indiana and Pennsylvania are omitted due to expanding Medicaid in 2015. A p-value reports results from F-tests measuring whether Medicaid expansion effects are statistically different between states that had prior policies and those that did not. Sample is limited to non-disabled adults between ages 22-64 with a high school degree or less. Regressions are adjusted using indicators for state, year, age, sex, race, marital status, foreign-born status, citizenship status, number of children and family size. All standard errors (parentheses) are clustered on state. (**) indicates significance at the 5 percent level.

Figure 1. Medicaid, Low-educated Parents

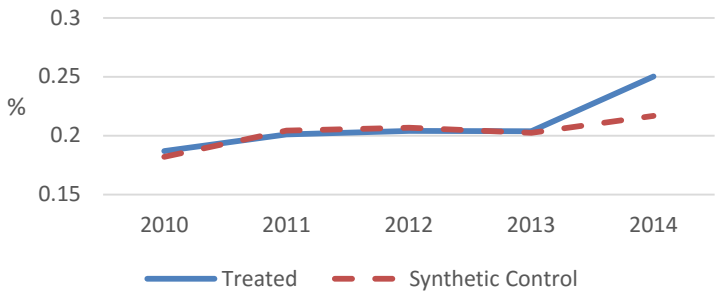


Figure 2. Uninsured, Low-educated Parents

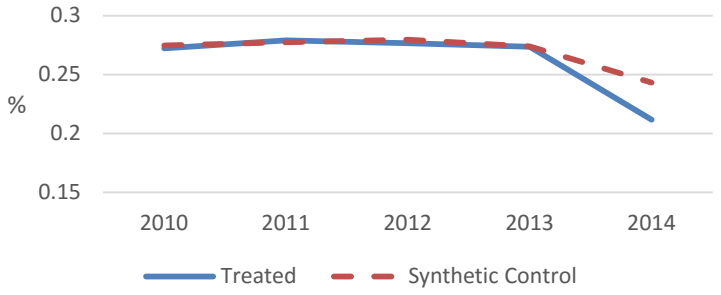


Figure 3. Private Insurance, Low-educated Parents

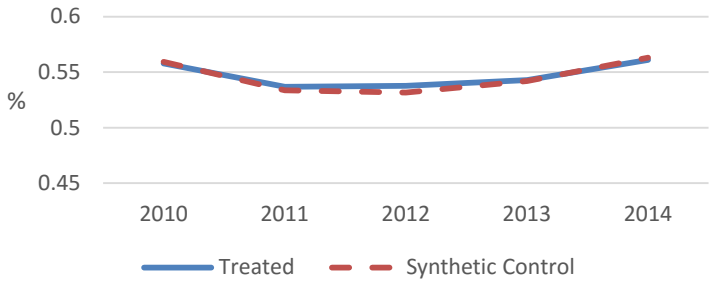


Figure 4. Medicaid, Low-educated Childless Adults

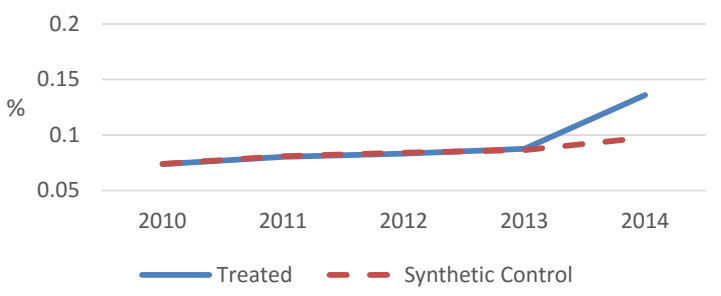


Figure 5. Uninsured, Low-educated Childless Adults

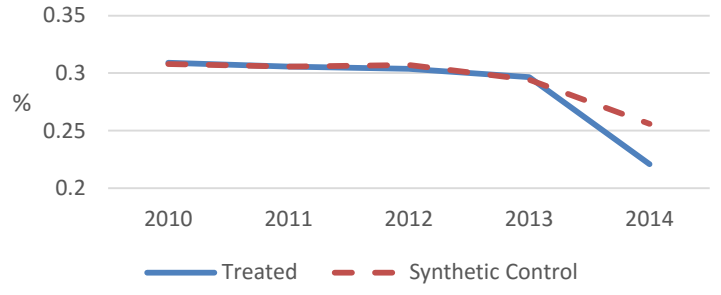


Figure 6. Private Insurance, Low-educated Childless Adults

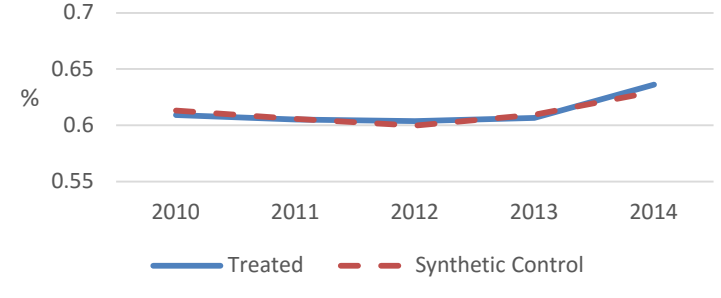


Figure 7. Employed, Low-educated Parents

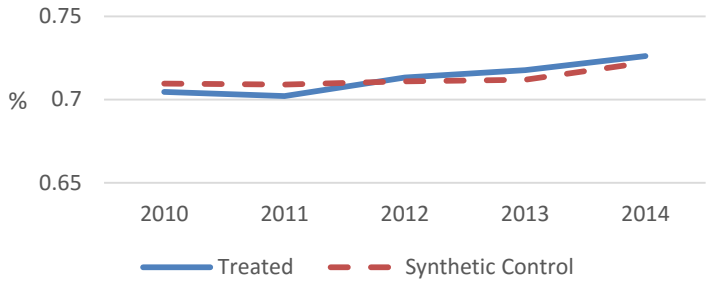


Figure 8. Hours Per Week, Low-educated Parents

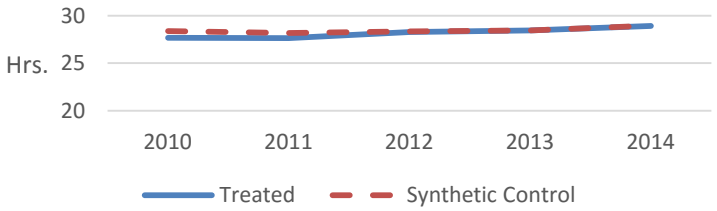


Figure 9. Work 30+ Hours, Low-educated Parents

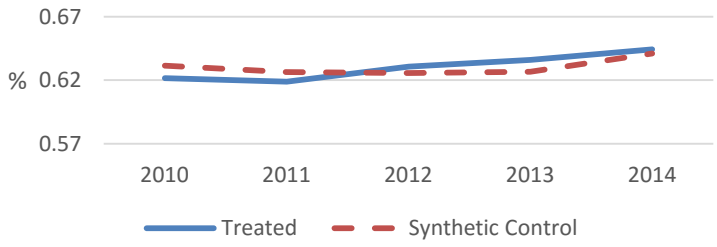


Figure 10. Employed, Low-educated Childless Adults

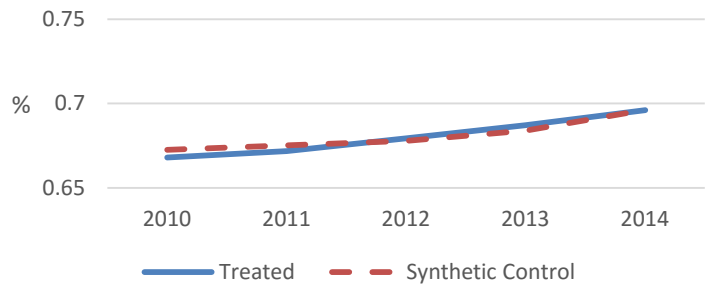


Figure 11. Hours Per Week, Low-educated Childless Adults

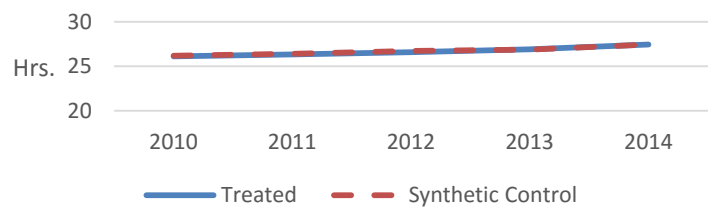
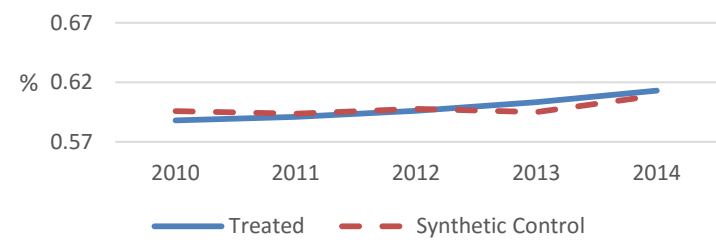


Figure 12. Work 30+ Hours, Low-educated Childless Adults



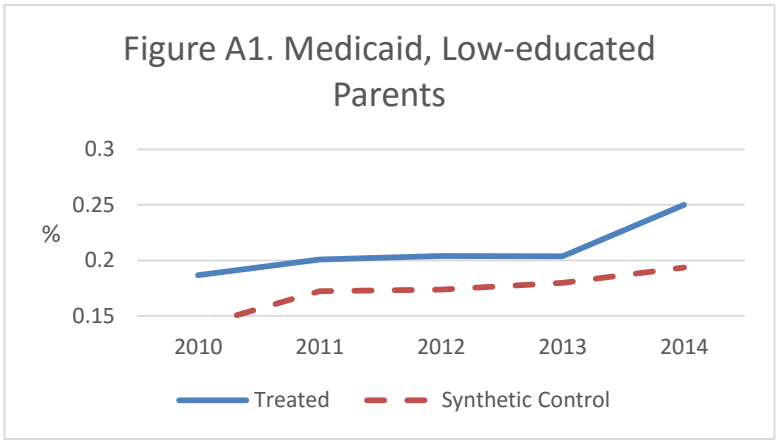


Figure A1. Medicaid, Low-educated Parents
0.3
0.25
%
0.2
0.15
2010
2011
2012
2013
2014
Treated
Synthetic Control

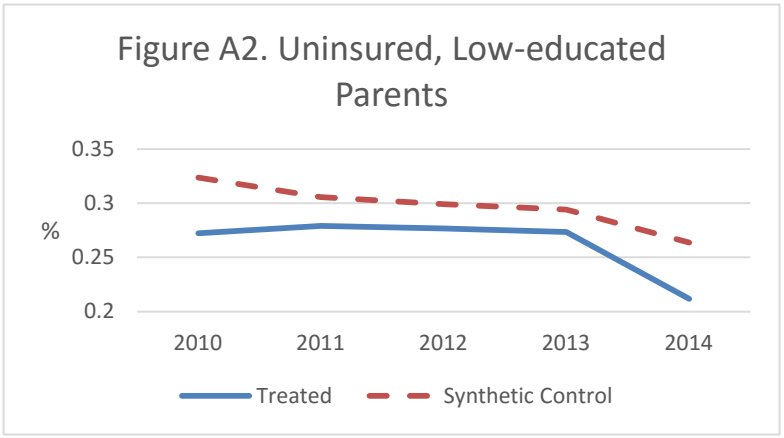


Figure A2. Uninsured, Low-educated Parents
0.35
0.3
%
0.25
0.2
2010
2011
2012
2013
2014
Treated
Synthetic Control

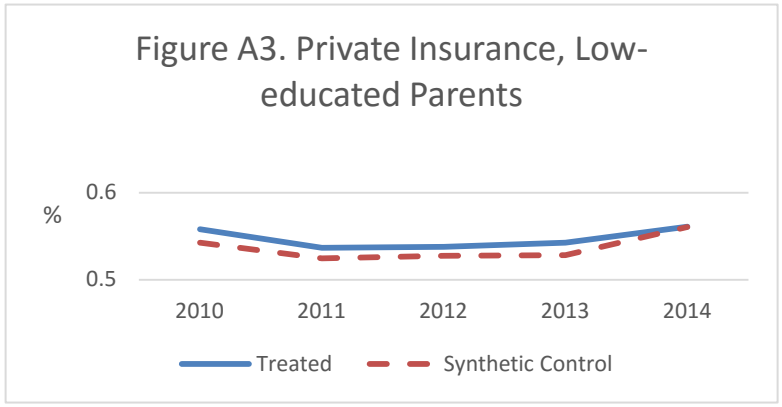


Figure A3. Private Insurance, Low-educated Parents
%
0.6
0.5
2010
2011
2012
2013
2014
Treated
Synthetic Control

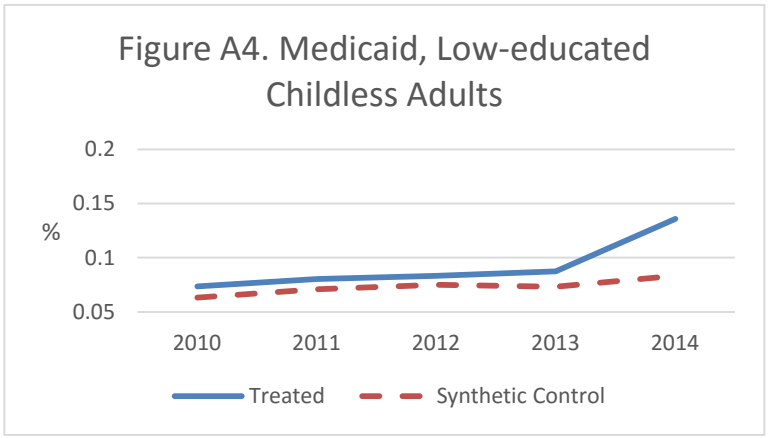


Figure A4. Medicaid, Low-educated Childless Adults
0.2
0.15
%
0.1
0.05
2010
2011
2012
2013
2014
Treated
Synthetic Control

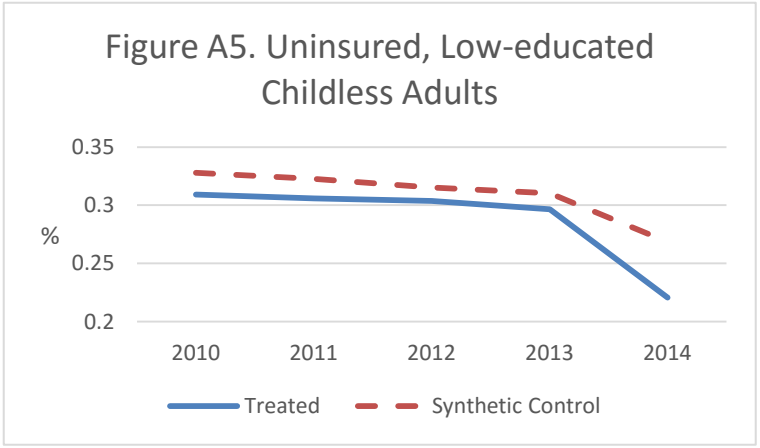


Figure A5. Uninsured, Low-educated Childless Adults
0.35
0.3
%
0.25
0.2
2010
2011
2012
2013
2014
Treated
Synthetic Control

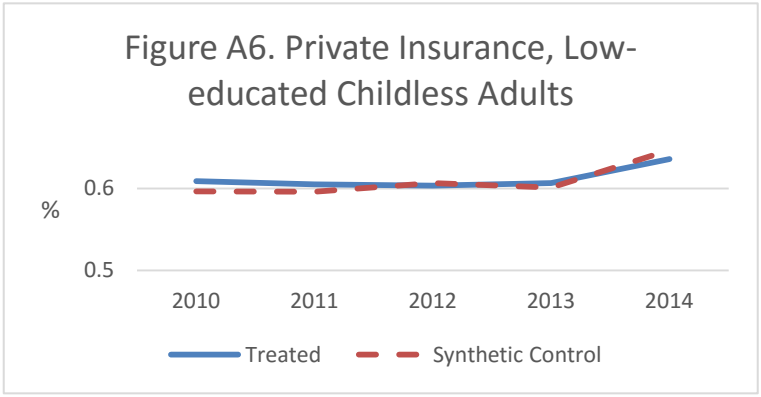


Figure A6. Private Insurance, Low-educated Childless Adults
0.6
%
0.5
2010
2011
2012
2013
2014
Treated
Synthetic Control

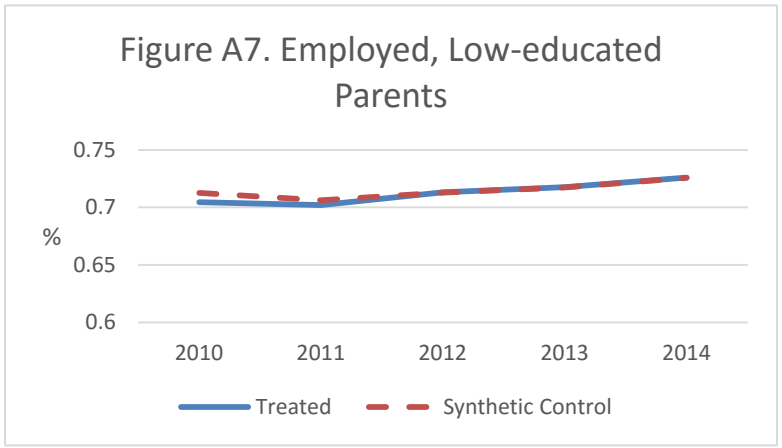


Figure A7. Employed, Low-educated Parents
0.75
0.7
0.65
0.6
%
2010
2011
2012
2013
2014
Treated
Synthetic Control

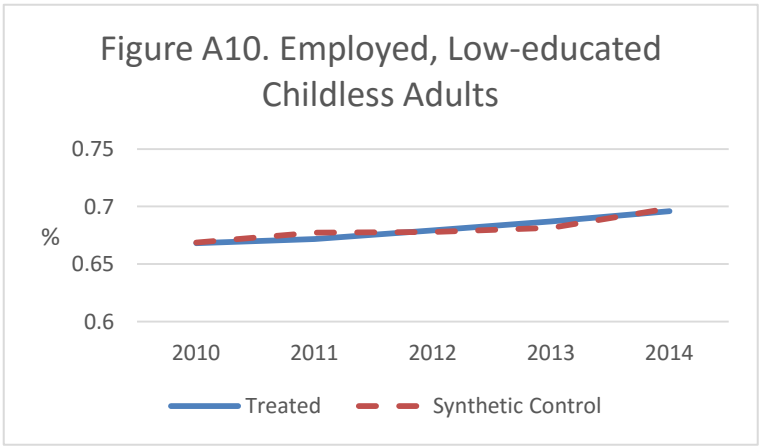


Figure A10. Employed, Low-educated Childless Adults
0.75
0.7
0.65
0.6
%
2010
2011
2012
2013
2014
Treated
Synthetic Control

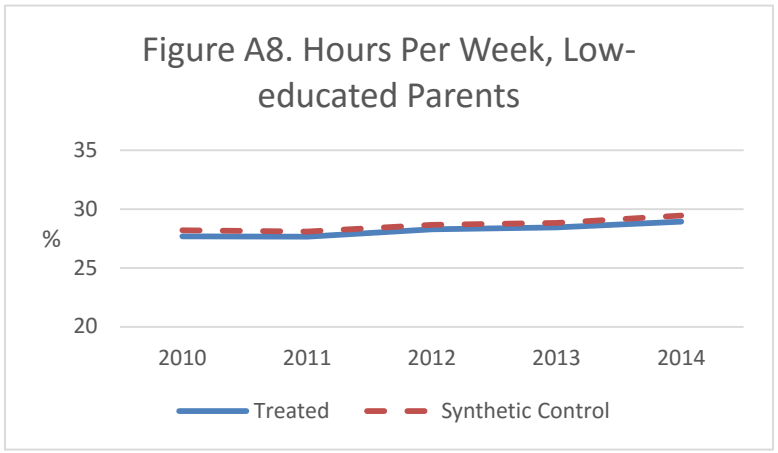


Figure A8. Hours Per Week, Low-educated Parents
35
30
25
20
%
2010
2011
2012
2013
2014
Treated
Synthetic Control

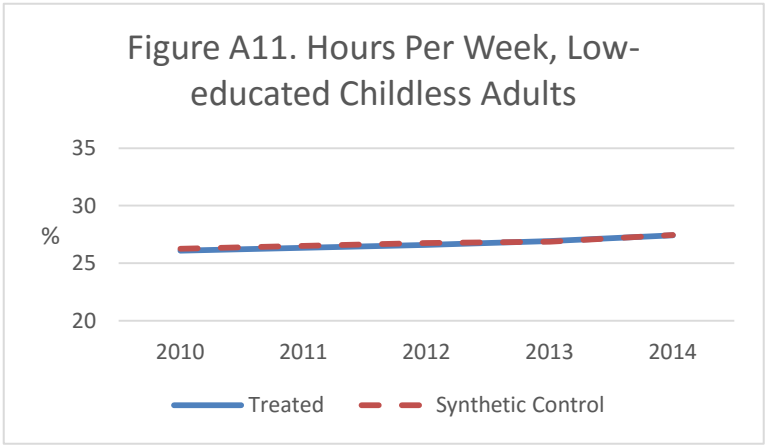


Figure A11. Hours Per Week, Low-educated Childless Adults
35
30
25
20
%
2010
2011
2012
2013
2014
Treated
Synthetic Control

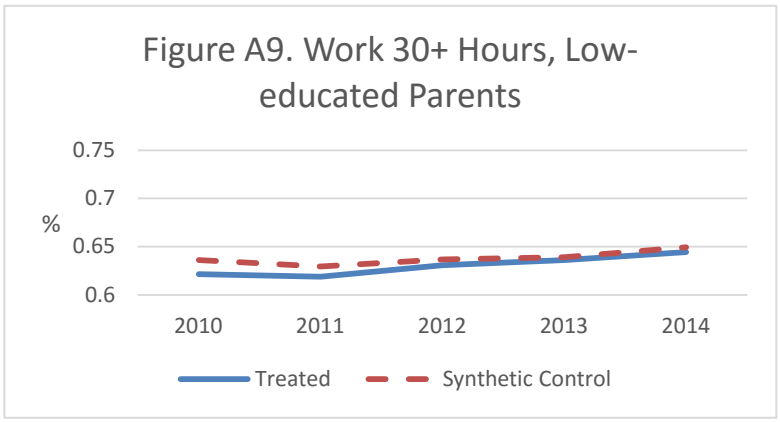


Figure A9. Work 30+ Hours, Low-educated Parents
0.75
0.7
0.65
0.6
%
2010
2011
2012
2013
2014
Treated
Synthetic Control

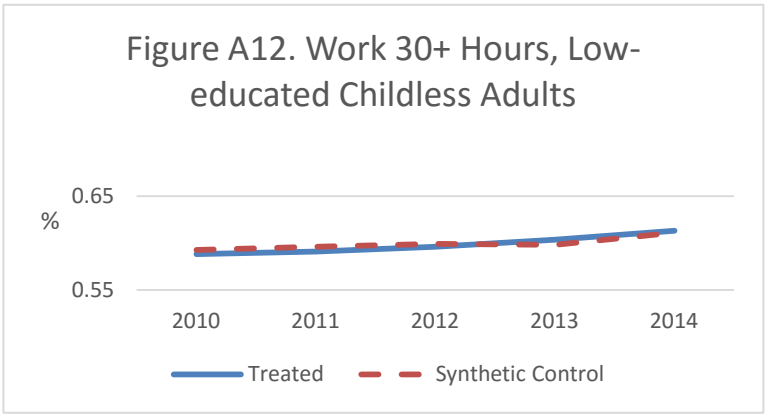


Figure A12. Work 30+ Hours, Low-educated Childless Adults
0.65
0.55
%
2010
2011
2012
2013
2014
Treated
Synthetic Control