The Effect of Public Health Insurance on Individual Consumption: Evidence from Medicaid Expansion

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Abstract

This paper examines the impact of the Affordable Care Act Medicaid expansion on individual consumption by leveraging nationally representative panel data of near-elderly adults in the United States. I take advantage of the panel structure to control for unobservable differences across individuals and to identify individuals who are more likely to be impacted by the expansion ex-ante. Using a difference-in-difference approach, I find that the ACA Medicaid expansion increases total monthly consumption by $144.13, which is equivalent to a 14.4 percent increase from the pre-expansion mean. This growth in total consumption is driven primarily by a rise in non-durable spending and housing consumption. Additionally, I observe that individuals in expansion states are 3.9 percentage points more likely to be homeowners than those in non-expansion states. These effects are driven by a reduction in out-of-pocket medical spending and an improvement in financial well-being.

JEL Codes: I13, I18, I31, I38.

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1. Introduction

Social insurance programs are government-sponsored interventions designed to protect the consumption of individuals and households against adverse shocks. These programs have been increasingly popular among policymakers and governments in developed countries in recent years. In the United States alone, government expenditures on social insurance have risen from less than 4 percent of the GDP in 1962 to 13 percent in 2019 (Barnes et al., 2021). Recent trends also show that the fraction of GDP allocated to social insurance increases sharply with GDP, indicating that social insurance programs are now a hallmark of modern developed economies (Chetty and Finkelstein, 2013). Considering the growing popularity of social insurance and its primary aim to protect consumption, a natural question arises: What is the impact of social insurance on individual consumption?

This paper provides new evidence on the effect of the Affordable Care Act (ACA) Medicaid expansion on individual consumption using nationally representative panel data of near-elderly individuals aged 50-64. As a classic measure of welfare, consumption offers two key advantages in this context. First, consumption can capture a wide array of factors beyond income that affect economic well-being, such as increased access to credit and the accumulation of assets. More importantly, consumption can directly measure the welfare effects stemming from in-kind transfers provided by social insurance programs[1]. This is particularly relevant among low-income individuals since they are more likely to be dependent on social insurance programs like Medicaid.

While there is an extensive body of literature examining the relationship between social insurance and consumption, there is relatively limited evidence regarding the specific impact of the ACA Medicaid expansion in the United States[2]. Previous studies on the welfare effects of in-kind transfers from health insurance have predominantly focused on the 1980s Medicaid expansion and the 1990s State Children's Health Insurance Program (SCHIP) (Gruber and Yelowitz, 1999; Leininger et al., 2010). In the case of ACA,

[1] See Meyer and Sullivan (2003) and Hurd and Rohwedder (2006) for detailed discussions on the advantages of consumption as a welfare measure.

[2] See (Fraker et al., 1990; Gundersen and Ziliak, 2003; Hoynes and Schanzenbach, 2009; Kaushal and Gao, 2011) for examples of work on the food stamp program, (Barrow and McGranahan, 2000; Goodman-Bacon and McGranahan, 2008; McGranahan and Schanzenbach, 2013) for the literature on EITC, and (Browning and Crossley, 2001; Gruber, 1994; Landais and Spinnewijn, 2021) for work related to unemployment insurance.

a closely related study using the cross-sectional data from the Consumer Expenditure Survey finds no significant impact of Medicaid on consumption among a sample of all non-elderly adults under the age of 65 (Levy et al., 2019). However, it is important to note that analysis using cross-sectional data is limited by the inability to identify ex-ante Medicaid eligibility and the possible bias from individual-level unobservables.

To overcome this limitation, this paper leverages restricted data from a nationally representative longitudinal survey of the Health and Retirement Study (HRS) from 2006 to 2018 and the corresponding 2007-2019 Consumption and Activities Mail Survey (CAMS) module. The HRS is a biennial survey involving approximately 20,000 individuals aged 50 and older. The restricted data allows me to access geographical information for my sample throughout the analysis period. My analysis focuses on near-elderly adults between the ages of 50 and 64 in 2014. The core survey provides exhaustive household and individual-level information, including health insurance, labor supply, and household income. The CAMS module is an off-year mail survey sent to a large random subset of the HRS core sample to collect a comprehensive measure of household spending on a wide range of spending categories.

This paper makes three main contributions. First, the panel nature of the HRS allows me to control for unobservable differences across individuals that can affect consumption by using individual fixed effects. Second, it enables me to identify individuals who are most likely to benefit from this expansion based on their pre-expansion characteristics and follow these individuals over time. This approach helps mitigate potential biases associated with individual-level differences correlated with potential responses to the ACA. Such biases may emerge in cross-sectional settings when the expansion influences factors affecting Medicaid eligibility post-expansion, such as household income. Finally, by focusing my sample of analysis on near-elderly adults, I provide new evidence on the impact of health insurance expansion on a subpopulation that faces a higher risk of adverse health shocks and consequently places a higher value on health insurance than the younger population.

Passed in 2010, a major provision of the Affordable Care Act was the removal of categorical-based eligibility and expansion of Medicaid eligibility to all adults in households with income under 138 percent of the Federal Poverty Line. Initially intended to

be a national reform, the Supreme Court's 2012 ruling granted states the discretion to extend Medicaid coverage. As a result, 26 states and the District of Columbia expanded coverage in 2014, with additional states following suit in the following years. Even though the adoption was not universal, this expansion resulted in a historic 21 million individuals who gained Medicaid coverage (DHS, 2022). This variation in state adoption serves as a natural experiment to analyze the causal impact of Medicaid expansion in this study. Specifically, I utilize the estimator developed by Callaway and Sant'Anna (2021) to compare relative changes in total consumption among individuals in expansion and non-expansion states.

I find that ACA Medicaid expansion increases total monthly consumption by $144.13 on average, which includes consumption of non-durable goods and services, housing, and transportation. This is equivalent to a 14.4 percent increase from the pre-expansion mean. I show that this estimate is robust to alternative specifications and sample selections. Upon decomposing the different categories of consumption, the growth in total consumption is primarily driven by the rise in housing consumption and spending on non-durables. In particular, I observe a significant 16.2 percent and 13.8 percent increase in housing consumption and non-durable spending, respectively. Furthermore, the rise in housing consumption encompasses an increase in both spending on rental housing and the flow of service from owner-occupied housing, suggesting an increase in homeownership rates. My analysis suggests that individuals in expansion states are 3.9 percentage points more likely to be homeowners than those in non-expansion states.

I investigate three potential mechanisms through which Medicaid can affect consumption. First, the substantial healthcare subsidy provided by Medicaid significantly reduces out-of-pocket medical expenses, freeing up resources that can be allocated to other goods and services. My analysis shows that Medicaid significantly reduces out-of-pocket medical spending by around 31 percent from the pre-expansion mean. In addition, Medicaid increases the probability of paying zero out-of-pocket medical spending by 7.1 percentage points, which is equivalent to a 29 percent increase from the pre-expansion mean. Second, I find that Medicaid leads to a significant improvement in financial well-being, as shown by a 5.2 percentage points reduction in the probability of having any outstanding debt and a 16.8 percent reduction in outstanding debt balance. This improvement in

financial well-being can lead to increased credit access, which can increase consumption and act as a key factor driving individuals to become homeowners. Finally, by reducing large medical expenditure risks and providing a welfare safety net, Medicaid can lead to a reduction in precautionary savings, which can raise consumption (Gruber and Yelowitz, 1999). While my estimate is not statistically significant, the point estimate is large, and my 95 percent confidence interval allows me to reject a reduction in savings of more than $6538.

This paper is structured as follows. Section 2 discusses the institutional background of Medicaid expansion and presents a brief theoretical framework. This is followed by sections 3 and 4, which provide detailed discussions of the data and empirical strategy used in this paper. Section 5 presents the main results of this paper. Section 6 describes the possible mechanisms. To assess the validity of my empirical results, I conduct several robustness checks in section 7, followed by the paper's conclusion in section 8.

2. Background

The Affordable Care Act is the largest expansion of health insurance coverage in the U.S. since the Medicare and Medicaid programs were implemented in 1965. Prior to the Affordable Care Act, Medicaid eligibility was largely restricted to specific low-income groups, such as individuals with disabilities, pregnant women, children, and some parents. The coverage for childless adults and the majority of parents was extremely limited. For instance, the median income level for Medicaid eligibility among working parents was only 61 percent of the Federal Poverty Line (FPL). Moreover, most states did not offer coverage to non-disabled adults who did not have dependent children, even if their income was extremely low (Heberlein et al., 2013).

The expansion of Medicaid removes these categorical-based eligibility and expands Medicaid eligibility to all adults in households that earn up to 138 percent of the Federal Poverty Line. Initially intended to be a national reform under the Affordable Care Act, the Supreme Court's 2012 ruling granted states the discretion to extend Medicaid coverage. The expansion status of each state is shown in Appendix Figure B.1. Since then, many studies have shown that Medicaid increases healthcare utilization and has positive

impacts on health (Borgschulte and Vogler, 2020; Chen, 2019; Ghosh et al., 2019; Miller et al., 2019). Other research also shows that the expansion results in substantial financial health improvement (Brevoort et al., 2017; Caswell and Waidmann, 2019; Miller et al., 2018). However, the evidence on Medicaid's impact on individual consumption is less conclusive.

This paper aims to contribute to the literature by providing new evidence on the impact of Medicaid on individual consumption. Theoretically, Medicaid can increase consumption by acting as a substantial transfer of resources. For the uninsured, Medicaid reduces the expected resources they need to allocate for all their medical needs. This also applies to individuals who were previously privately insured but chose to replace it with Medicaid. In contrast to private health insurance coverage in the United States, Medicaid provides a significantly higher healthcare subsidy with no premium, often entailing negligible or no co-payments for a range of medical services[3]. Appendix Figure B.2 provides detailed allowable cost-sharing amounts for those covered by Medicaid. In addition to no premiums and very little co-pay, no out-of-pocket costs can be imposed for emergency services, family planning services, pregnancy-related services, or preventive services for children[4]. Additionally, all out-of-pocket costs are limited to 5% of household income. Previous studies have shown that Medicaid significantly reduces out-of-pocket medical expenses, which can free up resources for the consumption of other goods and services (Dillender, 2017; Gotanda et al., 2020).

Another channel through which Medicaid can impact consumption is through an improvement in financial health (Brevoort et al., 2017; Caswell and Waidmann, 2019; Miller et al., 2018). Improvement in financial well-being can lead to increased credit access and reduced financial risk, which can increase consumption. Finally, by largely eliminating the risk of large out-of-pocket medical expenses, Medicaid may also reduce the need for precautionary savings. As documented by Gruber and Yelowitz (1999), this

[3] According to Kaiser Family Foundation, the average monthly worker contribution for private health insurance premium in 2018 is around $100 for single coverage and $460 for family coverage (KFF, 2022). The average premium for benchmark insurance purchased in the marketplace is even higher at $481 (KFF, 2023).

[4] Unlike private insurance and Medicare, Medicaid also covers non-emergency medical transportation, which helps enrollees get to their appointments, and long-term care including nursing home care and many home and community-based services.

reduction in precautionary savings can act as a means to increase consumption for eligible households.

3. Data

This paper employs a restricted access panel survey from the 2006-2018 Health and Retirement Study (HRS). First conducted in 1992, HRS is a biennial survey of individuals aged 50 and above in the United States. The HRS data is comprised of two main modules: the HRS core survey and the Consumption and Activities Module (CAMS). The core survey offers detailed information on individual characteristics, such as demographics, health insurance status, health status, employment, and out-of-pocket medical expenses. The restricted data allows me to obtain geographical information on all the respondents throughout my analysis period.

The primary sample comprises individuals who were between the age of 50-64 in 2014. I exclude individuals aged 65 and above in my analysis because these individuals are automatically enrolled in Medicare. The panel structure of the data allows for controlling for unobserved differences in individual characteristics using individual fixed effects. Another important advantage of this panel structure is that it allows me to use pre-expansion individual socioeconomic status to identify individuals who are most likely to benefit from the expansion. Specifically, I limit my sample to those with household income up to 200 percent of the Federal Poverty Line before 2014, which is the first year the expansion was enacted, or those with less than a high school degree[5]. To take into account the potential measurement error from reported income data, the education criterion is used collectively with the income criterion to capture individuals with low socioeconomic status that is likely to benefit the most from the ACA. Selecting my sample using pre-expansion characteristics prevents potential bias which may arise if there are individual differences correlated with potential responses to the ACA. In my main analysis, I exclude individuals who resided in states that significantly expanded Medicaid before 2014, namely VT, DC, DE, MA, and NY. Analysis that includes these states will be presented as robustness checks. My final sample includes approximately 3,100 unique

[5] As shown in robustness checks below, my results are robust to subgroups of individuals aged 65 and above and those with household income of at most 138% of FPL.

individuals, which results in around 15,500 person-year level observations.

Appendix Table A1 shows the demographic characteristics of our sample by state Medicaid expansion status during the pre-expansion period. In general, expansion states have a higher proportion of males, a higher proportion of individuals with insurance coverage, and a higher monthly wage than individuals in non-expansion states. However, individuals in non-expansion states are slightly more educated. The average age between individuals in both expansion and non-expansion states is very similar.

3.1. Consumption & Expenditure Module

To gather data on consumption, I will utilize the Consumption and Activities Module (CAMS), which is administered biennially in the off years from 2007 to 2019. The CAMS survey is randomly sent to approximately one-third of the full HRS sample each wave. The module collects a comprehensive measure of household spending on more than 30 different aggregated spending categories. For the primary consumption outcomes, I generate a total consumption variable comprising three major categories: non-durable spending, housing consumption, and transportation consumption. Non-durable spending consists of spending on services, clothing, food outside of the home, telecommunication, utilities (electricity, heat, water), and leisure activities. My final sample from the CAMS module includes around 950 individuals, which results in approximately 3,600 person-year level observations.

To obtain consumption measures for housing and transportation, I use a distinct approach from that of expenditure. The reason is that while the purchase of these items takes place in a single period, they provide continuous utility for multiple periods. As a result, the observed expenditure record is not a reliable estimator of consumption for both of these categories (Kay et al., 1984). For instance, an individual who purchases a car in 2012 will report positive car expenses in 2012 and zero expenses in 2014. In reality, an individual's actual consumption of car-related transportation is likely smooth from year to year. As a result, observed expenditure on housing and transportation may not accurately reflect actual consumption in those categories[6]. To derive consumption

[6] This also implies that non-durable spending is the same as non-durable consumption because purchases for non-durable goods occur frequently enough to be captured in each survey wave.

measures for housing and transportation, I employ a method similar to the one used by Hurd and Rohwedder (2006) to capture the flow of services from both categories.

Housing consumption encompasses spending on rent, property tax insurance, home or rental insurance, and a derived measure of home rental equivalence. The latter aims to capture the consumption services flow from housing and reflect the rental amount of housing in a competitive market equilibrium. The home rental equivalence is computed by adding the interest cost and depreciation value of the housing unit. Interest cost is determined by multiplying the value of housing (obtained from the main HRS core survey) with a three-year moving average of the prevailing 30-year mortgage rate. For the housing unit, I assume a 2.14 percent depreciation rate annually, which corresponds to a 47-year depreciation period.

Similarly, the measure for transportation consumption is calculated to calculate the service flow from automobile usage. The automobile usage variable is obtained from the main HRS core survey and includes interest cost on the value of the vehicle, 10 percent depreciation, and auto insurance expenses reported in the Consumption and Activities Module. Similar to housing, the interest cost for automobiles is calculated by multiplying the value of automobiles with a three-year moving average of 48-month loan rates for automobiles. All of the expenditure consumption variables are monthly and inflation-adjusted to the 2019 level. The top 1 percentile is also winsorized to take into account outliers.

Appendix Table A2 shows the baseline consumption variables in the pre-expansion period. The average consumption across all categories is similar between respondents in expansion and non-expansion states.

4. Empirical Strategy

To estimate the causal effect of Medicaid expansion on individual consumption, I will employ a difference-in-differences design that compares changes in individual consumption in the expansion states to those in the non-expansion states before and after the ACA Medicaid expansions were implemented. The identifying assumption here is that the changes in consumption among individuals in expansion states and non-expansion states

would have been the same in the absence of Medicaid expansion.

Until recently, the most widely used method for estimating causal effects in a difference-in-differences model with varying treatment timing has been the two-way fixed-effects (TWFE) linear regression. This model is specified as:

$$Y_{ijt} = \alpha + \beta_1 Expand_{jt} + \delta_t + \mu_j + \theta_i + \beta Age_{ijt} + \varepsilon_{ijt} \tag{1}$$

where Y_{ijt} is outcomes for individual i in state j at time t. $Expand_{jt}$ is a dummy variable, indicating whether state j expanded Medicaid at time t. Thus, β_1 is the coefficient of interest, which indicates the change in consumption among individuals in expansion states relative to individuals in non-expansion states. In this model, δ_t denotes year fixed effects and μ_j denotes state fixed effects. The panel nature of my data allows me to include individual level fixed effects, θ_i, to control for unobservable differences across individuals. I also control for individual's age, denoted by Age_{ijt}. Standard errors are clustered at the state level.

However, recent literature has pointed out several biases that can arise from TWFE estimators where there is heterogeneous treatment effects (Goodman-Bacon, 2021; Sun and Abraham, 2021). Specifically, TWFE may result in forbidden comparison, where it uses the already treated states (states that expand Medicaid early) as a control group. For example, a state that expanded Medicaid in 2014 might be used as a control group for a state that adopted Medicaid in 2016. To overcome these potential biases, I will mainly use the estimator proposed by Callaway and Sant'Anna (2021) in this paper[7].

4.1. Callaway & Sant'Anna Estimator (CS)

The CS estimator utilizes the group-time average treatment effect on the treated as a key element. Essentially, it estimates the average treatment effect at time t for the cohort/group initially treated in time g, denoted as $ATT(g,t)$ (Callaway and Sant'Anna, 2021; Roth et al., 2022). For example, $ATT(2014, 2018)$ is the average treatment effect in 2018 for states that expanded Medicaid originally in 2014. Under the parallel trends and no anticipation assumptions, $ATT(g,t)$ can be interpreted as the comparison between

[7] Estimates from TWFE model and other specifications are presented as robustness checks in section 7.

expected change in the outcome for the treated cohort between periods g-1 and t and the change in the outcome for a control group that is not treated at time t.

This method's primary advantage over the standard TWFE regression is that it is very clear exactly which units are being used as a control group. In this case, it does not use the already-treated states (i.e., states that expanded Medicaid in 2014) as a control group to the states that expanded Medicaid later. It essentially eliminates the "forbidden comparison" from the original TWFE specification.

Another feature of the CS estimator's group-time average treatment effect is that it extends easily to form more aggregated causal parameters. In this paper, I will use two main summary measures. First, I will aggregate the group-time average treatment effect with respect to the length of exposure to the Medicaid expansion, similar to the "event-study" approach. This will allow me to observe whether there is a differential trend in outcomes between expansion and non-expansion states (i.e., testing the parallel trends assumption). Second, I will aggregate all the group-time average treatment effects together into the overall effect of expanding Medicaid across the states that adopted the expansion. On each outcome, I will present both the "event-study" aggregation results and the overall ATT results. The control group in this analysis are states that never expanded Medicaid throughout my analysis period (i.e., never treated states)[8]. The estimation uses the doubly robust estimator, and the standard errors are calculated using a bootstrap procedure and clustered at the state level.

5. Results

5.1. Insurance Coverage & Labor Supply

I begin by estimating the impact of Medicaid Expansion on Medicaid coverage, private insurance coverage, and uninsured rate. The results are presented in Table 1. Consistent with previous literature, I find that individuals who reside in expansion states are significantly more likely to be enrolled in Medicaid. From column 1, I find that the probability of an individual enrolled in Medicaid increases by 8.1 percentage points. This represents a

[8] Note that Callaway and Sant'Anna (2021) allows using either never-treated units or not-yet-treated units as a control group.

42 percent increase relative to the baseline Medicaid coverage before the expansion. This is consistent with estimates from previous literature, which range from 3.0 p.p. increase (Leung and Mas, 2018) to 12.5 p.p. increase in Medicaid coverage (Miller et al., 2019). The results also show that Medicaid reduced the uninsurance rate by 3.9 percentage points on average following the expansions.

In addition to a reduction in the uninsured rate, I find that the increase in Medicaid is accompanied by the "crowd-out" effect on private insurance coverage, as evidenced by column 3 in Table 1. On average, individuals in expansion states are 4.8 percentage points less likely to be covered by private insurance coverage. When compared to earlier studies, my result is consistent with the seminal paper by Cutler and Gruber (1996), who found a significant decline in private coverage when Medicaid eligibility was first expanded in the 1980s. In subsequent studies on the ACA Medicaid expansion, Leung and Mas (2018) and Kaestner et al. (2017) also find small negative effects on private coverage. Figure 1 shows the pre-expansion and post-expansion trends in Medicaid coverage, the rate of uninsurance, and private insurance coverage.

I further investigate how Medicaid affects labor supply. There are a number of potential channels through which Medicaid can impact labor supply. First, Medicaid's income eligibility threshold may discourage an individual's employment and earnings. The increased access to public health insurance may also encourage individuals to reduce their work hours since they no longer need employer-based health insurance[9]. On the other hand, Medicaid can also increase labor supply through improvement in health and reduction in the risk of adverse health shocks. Ultimately, I do not find a significant effect of Medicaid on employment as evidenced by column 1 in Appendix Table A3. This is consistent with the previous finding by Baicker et al. (2014), where they find insignificant impact on employment as a result of the Oregon Health Insurance Experiment[10].

The rest of columns 2 through 5 in Appendix Table A3 summarize the intensive margin effect of Medicaid coverage. Columns 2 and 3 indicate the unconditional effect on hours worked and monthly wage, while columns 4 and 5 show the effect on intensive margin only

[9] In related literature, the employer-based health insurance may cause a phenomenon called "job-lock," where job mobility is reduced due to employee's ties to employer's health insurance (Gruber and Madrian, 1994; Madrian, 1994).

[10] Others such as Leung and Mas (2018) and Kaestner et al. (2017) find similar null results on employment, while Peng et al. (2020) find small negative and transitory effects on employment.

among those who are employed. Columns 2 and 3 demonstrate that despite the negative point estimates, there is no statistically significant impact on both weekly hours worked and monthly wages. In contrast, when examining columns 4 and 5, it becomes evident that the influence on the intensive margin is more pronounced for individuals who are currently employed. On average, I observe a decline of 0.92 hours per week among those who are employed. This translates to a decline of approximately 2.5 percent from the mean. Additionally, this decrease in work hours results in a corresponding reduction of around 6.7 percent in monthly wages. The pre and post-expansion trends in labor supply shown in Figure B.3 are consistent with the results from Appendix Table A3. These results suggest that while the impact of Medicaid on labor supply is modest, it does not completely rule out the potential labor supply response to Medicaid among those who are employed.

5.2. Out-of-pocket Medical Expenditures

Figure 2 and Table 2 show the effect of Medicaid on out-of-pocket medical spending. The out-of-pocket medical spending encompasses out-of-pocket expenses for all medical services, such as outpatient/inpatient services, health insurance premiums, prescription drugs, home health services, and dental visits. The top figure shows that before the expansion of Medicaid, point estimates for health spending were flat and near zero through 2014. I observed a significant reduction in out-of-pocket health expenditure immediately after the post-expansion period. Since Medicaid eliminates almost all of the cost-sharing medical costs from its beneficiaries, I also observe a significant jump in the probability of paying zero out-of-pocket medical spending, as evidenced by the right figure of Figure 2.

Table 2 shows the overall effect of Medicaid on out-of-pocket medical expenditures. Consistent with the event study results, columns 1 and 2 indicate that Medicaid has a significant effect on reducing out-of-pocket medical costs and increasing the probability of paying nothing out-of-pocket. Specifically, Medicaid decreases out-of-pocket medical expenses by approximately $82 per month. This amounts to a 31 percent reduction from the mean. Furthermore, Medicaid raises the chances of paying zero out-of-pocket medical expenses by 7.1 percentage points, which is equivalent to a 29 percent increase from the mean.

To examine whether the decrease in out-of-pocket expenses is due to reduced healthcare utilization, I analyzed the patterns in the frequency of doctor visits and hospital admissions following Medicaid enrollment. Despite the significant decline in out-of-pocket medical expenditures due to Medicaid, I do not find a decrease in healthcare utilization as shown in Appendix Table A4.

5.3. Consumption

The previous estimates show that Medicaid has a significant impact on Medicaid coverage and significantly reduces out-of-pocket medical spending. The reduction in out-of-pocket medical expenditure suggests a sizeable transfer of resources as it can free up significant financial resources for other goods and services. This section presents the main results of this paper by investigating the effect on individual consumption. The top left figure in Figure 3 shows how the effect of Medicaid on total consumption varies with the length of exposure to the expansion. Before the expansion, event-study coefficients were close to zero and not statistically significant, indicating that there is no differential trend in individual consumption across the two groups. I immediately observed a jump in consumption among our sample in expansion states relative to non-expansion states starting in the first year of the expansion. The estimate reveals a statistically significant increase of monthly consumption by a little over $160 in the year 0 and year 2 of the expansion. The increase in consumption is more modest by year 4 of the expansion, with the point estimate indicating a meaningful-sized effect of around $90 monthly increase.

Column 1 on Table 3 reveals the overall average effect of Medicaid expansion on total consumption using the CS estimator. It shows that Medicaid leads to a statistically significant increase in monthly total consumption of about $144.13 on average. This corresponds to a sizeable 14.4 percent increase relative to the pre-expansion mean.

Next, I conduct additional analyses on each major category of consumption to determine the categories of consumption that are affected by Medicaid the most. As mentioned in section 3, total consumption is composed of three distinct consumption categories: spending on non-durables, housing-related consumption, and transportation consumption. The results from the rest of the columns in Table 3 show that the rise in total consumption is primarily driven by non-durable spending and housing consumption. On

average, Medicaid raises monthly non-durable spending and housing consumption by approximately $69.9 and $67.92, respectively, representing around 13.8 percent and 16.2 percent from the mean. Conversely, I find no statistically significant increase in transportation consumption. The rest of the figures in Figure 3 show the event study results on non-durable spending, housing consumption, and transportation consumption. Overall, the results from the event studies are consistent with the point estimates from Table 3.

5.4. Additional Analysis on Housing Consumption

As previously discussed, housing consumption includes a derived measure of home rental equivalence, spending on rent, property tax insurance, and home/rental insurance. Columns 1 through 4 in Table 4 report the estimates on each category of housing consumption. Column 1 represents the estimate of home rental equivalent, which is a measure of the flow of services from owner-occupied housing. Overall, the majority of the rise in housing consumption is driven by an increase in the flow of services from both owner-occupied housing and rental housing, as indicated by the increase in home rental equivalent and spending on rent. To further investigate the driver of the increase in home rental equivalent, I examine whether the expansion results in higher homeownership rates. To identify homeownership status, I construct a dummy variable that indicates whether a respondent reports having a mortgage or is a homeowner. The estimated coefficient is presented in column 5 in Table 4. I find that Medicaid increases the likelihood of becoming a homeowner by 3.9 percentage points, which is a 7.3 percent increase from the pre-expansion mean. These findings corroborate the results in Kuroki and Liu (2021), which also find an increase in homeownership rates due to Medicaid expansion.

6. Discussion

6.1. Mechanism

Due to its substantial subsidy for medical spending, Medicaid represents a significant transfer of resources to its beneficiaries. As shown in columns 1 and 2 in Table 2, Medicaid significantly reduces out-of-pocket medical expenses and substantially increases the likelihood of zero out-of-pocket medical spending. This effectively frees up resources that

individuals can allocate to the consumption of other goods and services.

Another mechanism through which Medicaid can contribute to increased consumption and homeownership rates—an important driver in housing consumption—is the improvement in financial well-being. It is well documented in the literature that Medicaid is associated with a reduction in unpaid medical bills, mortgage delinquency, the incidence of medical bankruptcy, and improved credit scores—all of which help individuals maintain good credit health (Brevoort et al. (2017); Miller et al. (2018); Caswell and Waidmann (2019); Gallagher et al. (2019)). These factors can contribute to an enhanced credit history and increased credit access (e.g., having more favorable mortgage rates). When coupled with the savings resulting from reduced medical expenses and protection against medical bankruptcy, Medicaid can effectively increase consumption and make homeownership more accessible.

In line with previous research, my findings demonstrate that Medicaid decreases the likelihood of households having unpaid debts and significantly reduces the amount of such debts. As shown in columns 1 and 2 on Table 5, Medicaid is associated with a reduction of 5.2 percentage points in the probability of having any outstanding debt, which represents a decline of approximately 12 percent from the pre-expansion mean. Additionally, Medicaid enables individuals to pay off their existing debts, resulting in a reduction of such debts by 16.8 percent from the pre-expansion mean.

Finally, individuals may also utilize their savings to increase their consumption. By reducing large medical expenditure risk, Medicaid may reduce eligible households' need for precautionary savings (Gruber and Yelowitz, 1999). Self-insurance against medical risk may be a reasonable option for many individuals, even among those who are privately insured. This is because unlike private insurance, Medicaid has very little cost-sharing, as discussed in section 2. Column 3 on Table 5 presents the impact of Medicaid on individual liquid assets, which constitutes the total amount from savings/checking accounts, government savings, and bonds. I observe a sizeable negative coefficient, even though it's statistically insignificant. My 95 percent confidence interval allows me to reject that Medicaid causes a reduction in individual savings of more than $6538. Figure 5 shows the pre and post-expansion trends in financial health and savings among residents in expansion states after Medicaid expansion was enacted.

7. Robustness Checks

7.1. Alternative Specifications

As discussed in Section 4, this paper employs the estimator developed by Callaway and Sant'Anna (2021) to address the limitations of the TWFE estimator in the presence of heterogeneous treatment timing, as evident in the distinct timings of each state's Medicaid expansion. In this section, I present the results on total consumption across various specifications as a comparison to the estimates from the main specification. These include results from the CS estimator incorporating early expander states, sample restriction based on lower income threshold of 138% of FPL, as well as other methodologies such as TWFE, the triple difference model, and the BJS imputation estimator proposed by Borusyak et al. (2021)[11]. The triple difference model utilizes two additional control groups: those who are 65 and older in 2014 and those who earn 400+ percent of the Federal Poverty Line.

The results are summarized in Figure 6. It shows that the estimates from my main specification remain comparable to the alternative specifications and sample definitions. The estimates from the sample restriction based on lower income threshold, the inclusion of early expander states, and the BJS imputation estimator are similar to the estimate from the main specification. They are all statistically significant. The estimates from the TWFE and the first triple difference model (400+ percent of the FPL) are slightly smaller in magnitude and less precise, although they remain significant at the 10 percent level. Lastly, the triple difference model using individuals aged 65 and older as the 'placebo group' provides a significantly larger point estimate than my main specification.

7.2. Placebo Tests

This section presents a series of placebo tests to further assess my empirical model's validity. Specifically, I investigate the effect of Medicaid expansion on the sub-populations that are less likely to be affected by the policy change.

[11] While both CS estimator and BJS estimator are new estimators designed to overcome the deficiency of the standard TWFE model, there are some key differences between the two estimators. I refer the reader to the summary paper by Roth et al. (2022) that summarizes the different approaches between the two estimators.

My first placebo test examines how Medicaid expansions impacted individuals aged 50-64 years old in 2014 in high-income households (i.e., individuals with families earning more than 400 percent of the Federal Poverty Level and possessing at least a high school degree). This group is expected to experience much less pronounced effects compared to my primary sample. However, individuals within these categories may also attain Medicaid coverage at a later time due to changes in their income, as noted by Miller et al. (2019). In my second placebo test, I explore whether Medicaid expansions had any impact on low-income individuals aged 65 years or older in 2014. In the United States, a significant portion of individuals within this subgroup are covered by the Medicare program. Medicare and Medicaid are distinct programs with different cost-sharing structures. For dual-eligible individuals, Medicare typically takes precedence in covering services shared by both programs, as Medicaid generally serves as the payer of last resort (CMS, 2023). The outcomes of both placebo tests are presented in Figure 7, allowing for a direct comparison with the baseline main specification in this paper. As anticipated, the estimates from Figure 7 reveal no significant effect of Medicaid expansions on consumption within either of these groups.

7.3. Influence of Housing Price

My primary analysis reveals that Medicaid expansion leads to an increase in housing consumption, and this is partly attributed to a rise in homeownership rates. One potential concern is that the rise in housing consumption in expansion states relative to non-expansion states is confounded by a differential trend in housing prices between expansion and non-expansion states. As a placebo test, I re-estimate equation 1 using log housing price as the dependent variable. To do this, I derive seasonally adjusted housing price data from Zillow. As shown in Appendix Figure B.5, I find no significant relationship between Medicaid expansion and housing prices.

8. Conclusion

Social insurance programs are designed to protect the welfare of individuals against adverse shocks. The results of this paper contribute to the large social insurance literature

by analyzing the consumption impact of one of the largest social insurance programs in the United States on a panel of nationally representative individuals aged 50-64. The panel structure of the data allows me to control for unobserved differences across individuals using individual fixed effects and utilize pre-expansion individuals' socio-economic status to identify those who are most likely to benefit from the expansion.

My results indicate that the expansion of Medicaid increases monthly total consumption by $144.13 on average, which is equivalent to a 14.4 percent increase from the pre-expansion mean. When analyzing different categories of consumption, I observe a significant effect across major consumption categories, such as spending on non-durables and housing consumption. I also find that the latter is partly driven by an increase in homeownership rates. I believe that there are several explanations for my results. First, Medicaid significantly reduces out-of-pocket healthcare spending, which frees up resources that can be used for the consumption of other goods and services. Additionally, I find a significant improvement in financial health due to Medicaid, as indicated by the reduction in financial debt. As Medicaid reduces the risk of catastrophic medical expenses and improves financial well-being, it can increase consumption and act as a key driver for increasing homeownership rates among eligible households. Lastly, I also observe a sizeable but statistically insignificant decline in savings, indicating that households may reduce their precautionary savings to increase consumption.

This paper sits at an important juncture where government spending on social insurance is on the rise, and affordable healthcare remains a pressing issue. The results from this paper align with a substantial body of research demonstrating that the impact of health insurance expansion extends beyond health outcomes.

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9. Tables

Table 1: Impact on Health Insurance Coverage

	(1) Medicaid Coverage	(2) Uninsured	(3) Private Coverage
Coefficients	0.081**	-0.039*	-0.048***
	(0.03)	(0.022)	(0.015)
Pre-2014 mean	0.19	0.37	0.36
Observations	15,258	15,291	15,319

Notes: The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. Medicaid coverage is a dummy variable that is equal to one if respondents report being covered by Medicaid. Uninsured is a dummy variable that is equal to one if respondents report not being covered by any type of health insurance, including Medicare, Medicaid, private insurance, VA health insurance, and long-term care insurance. Private coverage is a dummy variable that is equal to one if respondents report being covered by employer-sponsored or privately bought insurance coverage. All estimates also include age as a covariate. Standard errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

Table 2: Impact on Out-of-Pocket Medical Expenditure

	(1) OOP Medical Expenditure (Monthly)	(2) OOP Medical Expenditure = 0
Coefficients	-82.44***	0.071***
	(29.64)	(0.023)
Pre-2014 mean	264.39	0.245
Observations	15,552	15,552

Notes: The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. OOP Medical spending indicates monthly out-of-pocket medical expenditure, where the top 5 percentile is winsorized and adjusted for inflation to 2019 $. It includes all out-of-pocket expenses on medical services such as inpatient/outpatient service, health insurance premiums, prescription drugs, home health services, and dental visits. Column 2 represents a dummy variable that is equal to one if the reported out-of-pocket medical spending is equal to zero. All estimates also include age as a covariate. Standard errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

Table 3: Impact on Total Consumption

	(1) Overall Consumption	(2) Non-Durable Spending	(3) Housing Consumption	(4) Transportation Consumption
Coefficients	144.13***	69.90*	67.92***	13.77
	(47.65)	(42.04)	(16.24)	(9.35)
Pre-2014 Mean	997.46	504.97	418.75	87.69
Observations	3,604	3,445	3,604	3,604

Notes: The sample of analysis comes from the Consumption and Activities Module of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. All consumption variables are monthly and adjusted to 2019 $. The top 1 percentile is also winsorized. Total consumption encompasses spending from non-durables, housing consumption, and transportation consumption. Non-durable spending includes spending on all non-durable goods and services, such as food, clothing, and leisure activities. Housing consumption is composed of flow of service from owner-occupied housing (home rental equivalent), spending on rental housing, property tax insurance, and home/renter insurance. Transportation consumption includes consumption from automobiles and spending on automobile insurance. All estimates also include age as a covariate. Standard errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

Table 4: Components of Housing Consumption & Homeownership Indicator

	(1) Home Rental Equivalent	(2) Home/Renter Insurance	(3) Property Tax Insurance	(4) Rent Spending	(5) Homeownership Status
Coefficients	36.08*	0.48	6.92	31.74*	0.039*
	(21.46)	(3.63)	(4.72)	(18.18)	(0.022)
Pre-2014 Mean	246.15	20.72	29.58	291.69	0.53
Observations	3,604	3,168	3,154	3,089	3,604

Notes: The sample of analysis comes from the Consumption and Activities Module of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. Column 1 through 4 represents each component of the housing consumption variables. Column 1 is the home rental equivalent. It represents the flow of service from owner-occupied housing, and it's composed of two main components: depreciation cost and interest cost. All variables from columns 1 through 4 are monthly and adjusted to 2019 $. The top 1 percentile is also winsorized. Column 5 is a dummy variable that is equal to one if a respondent is a homeowner. All estimates also include age as a covariate. Standard errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

Table 5: Impact on Financial Health & Savings

	(1) Owe Any Debt	(2) Debt Amount	(3) Individual Savings
Coefficients	-0.052**	-502.28**	-2719.9
	(0.028)	(134.142)	(1948.06)
Pre-2014 mean	0.42	2990.35	10536.8
Observations	15,136	15,136	15,552

Notes: The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. Column 1 is a dummy variable indicating whether respondents report any outstanding debt. Column 2 represents $ amount of outstanding debt. This variable includes debt from credit card balances, medical debt, life insurance policy loans, and other loans. Column 3 refers to individuals' liquid savings, which include a balance in savings/checking accounts, government savings, and bonds. All variables are adjusted to 2019 $. The top 1 percentile of these variables are also winsorized. All estimates also include age as a covariate. Standard errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

10. Figures

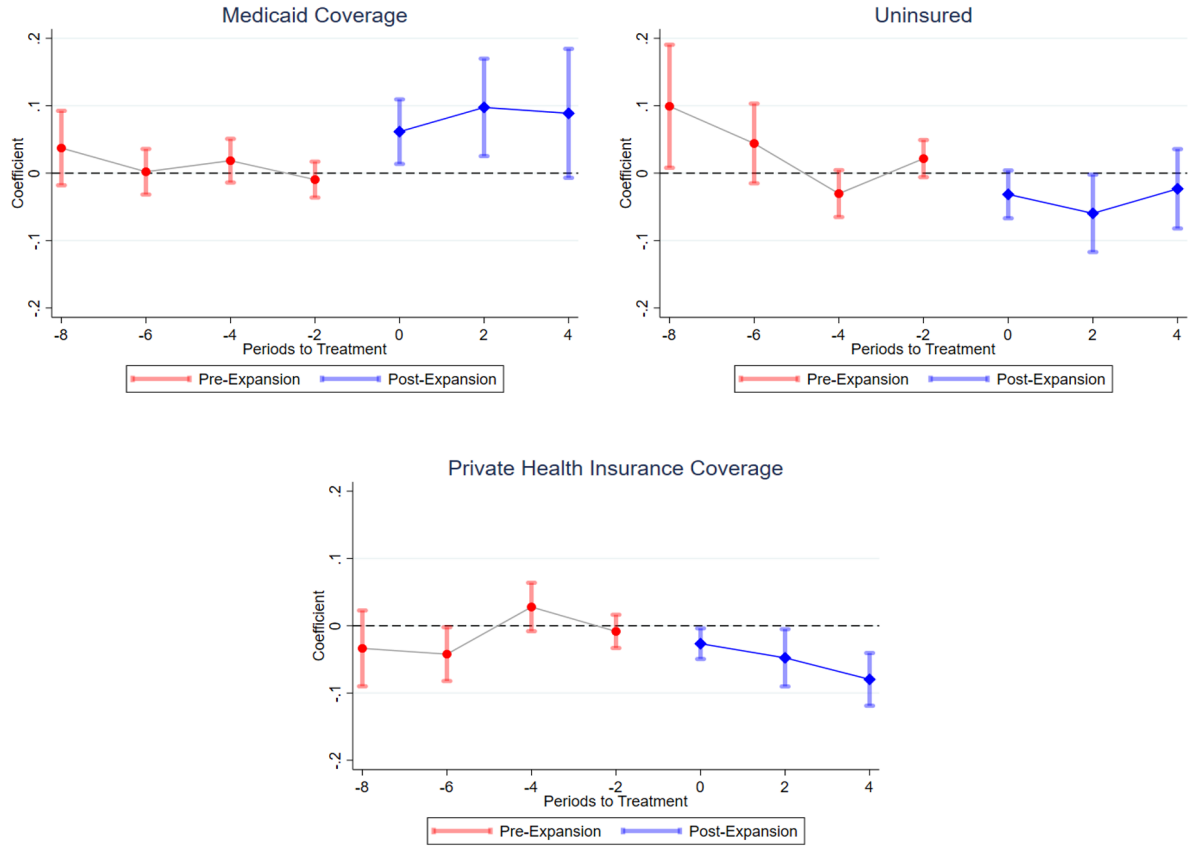

Figure 1: Insurance Coverage

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. Medicaid coverage is a dummy variable that is equal to one if a respondent reports being covered by Medicaid. Uninsured is a dummy variable that is equal to one if respondents report not being covered by any type of health insurance, including Medicare, Medicaid, private insurance, VA health insurance, and long-term care insurance. Private coverage is a dummy variable that is equal to one if a respondent reports being covered by private health insurance. All estimates include age as a covariate. Standard errors are clustered at the state level.

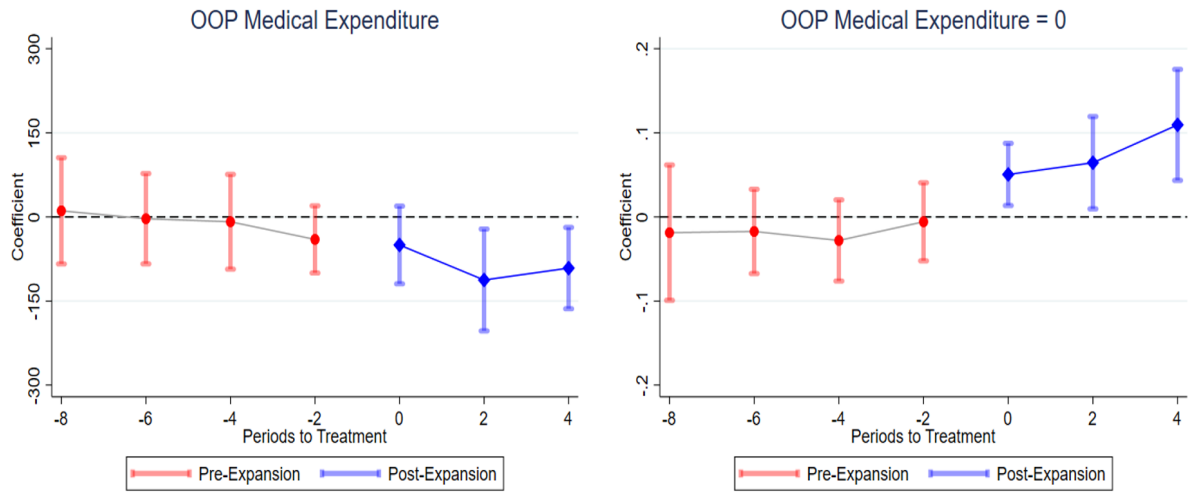

Figure 2: Out-of-pocket Medical Expenditure

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. OOP Medical expenditure is monthly, and it's adjusted for inflation to 2019 CPI. The top 5 percentile is also winsorized. It includes all out-of-pocket expenses on medical services such as inpatient/outpatient service, health insurance premiums, prescription drugs, home health services, and dental visits. The right figure represents a dummy variable that is equal to one if the reported out-of-pocket medical spending is equal to zero. All estimates include age as a covariate. Standard errors are clustered at the state level.

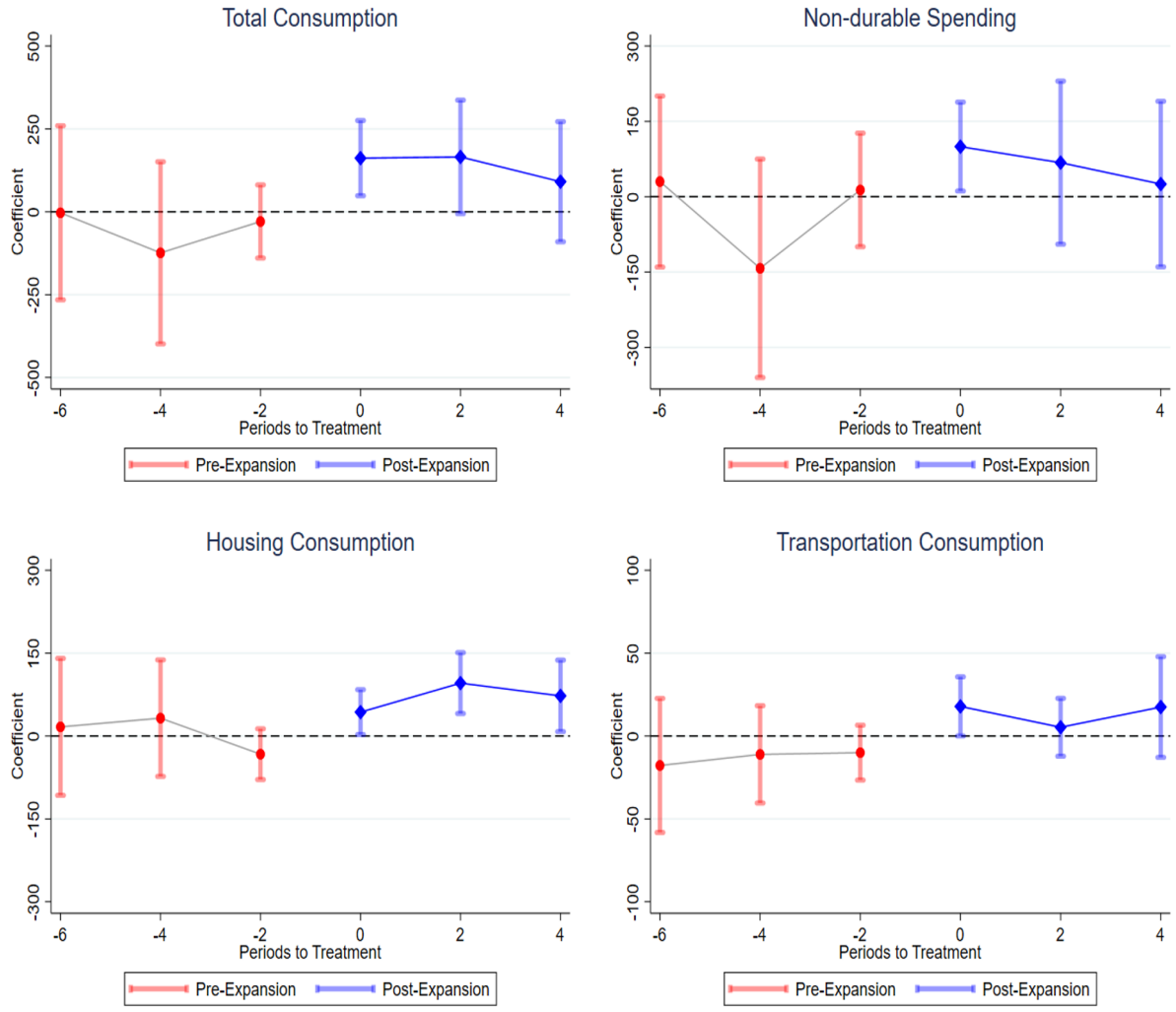

Figure 3: Total Consumption & Consumption Categories

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the Consumption and Activities Module of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. Total consumption encompasses spending from non-durables, housing consumption, and transportation consumption. Non-durable spending includes spending on all non-durable goods and services such as food, clothing, and leisure activities. Housing consumption is composed of flow of service from owner-occupied housing (home rental equivalent), spending on rental housing, property tax insurance, and home/renter insurance. Transportation consumption includes consumption from automobiles and spending on automobile insurance. All consumption variables are monthly and adjusted to 2019 $. The top 1 percentile is also winsorized. All estimates include age as a covariate. Standard errors are clustered at the state level.

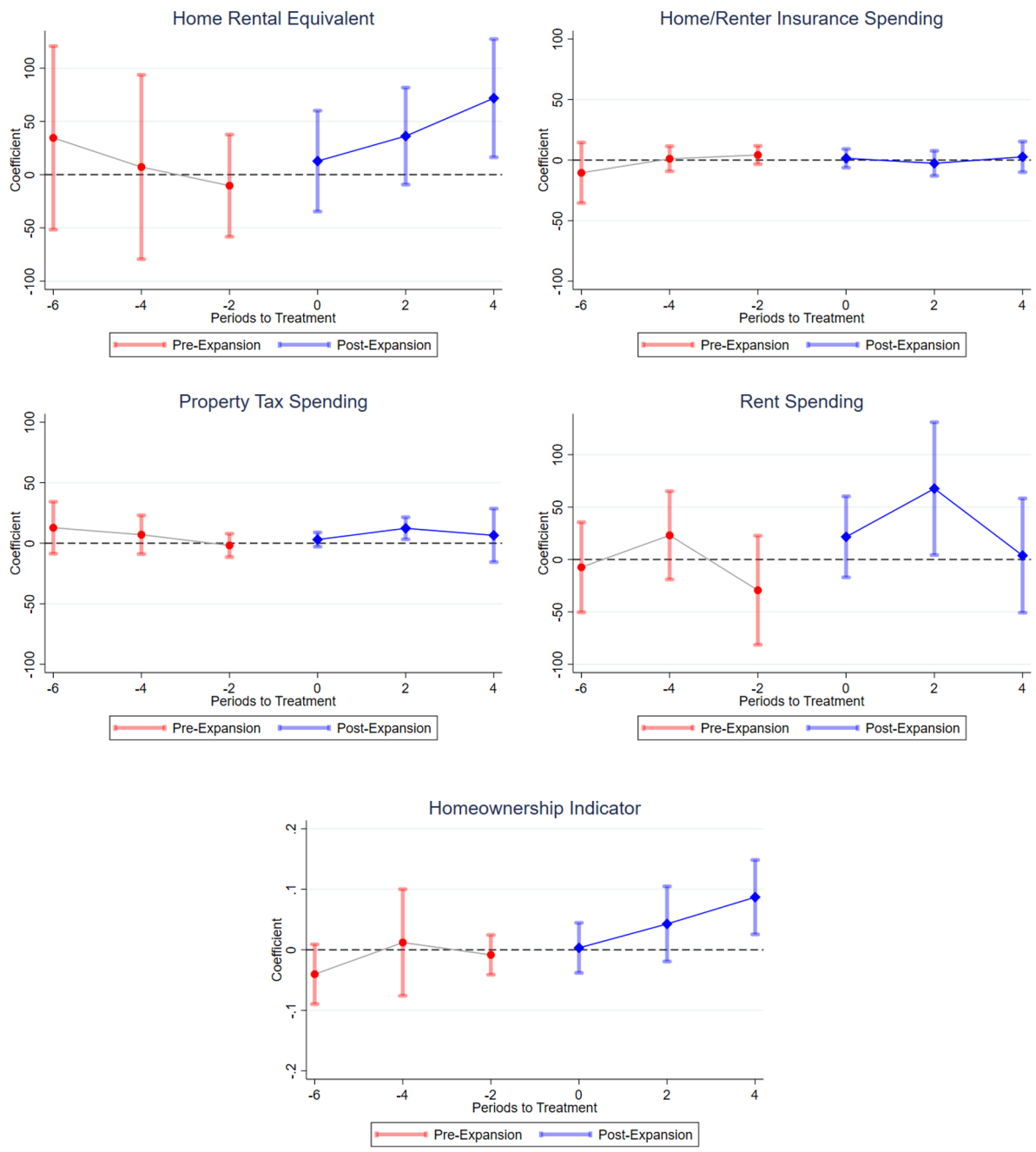

Figure 4: Component of Housing Consumption & Homeownership Indicator

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using the Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the Consumption and Activities Module of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All variables are monthly and adjusted to 2019$. The home rental equivalent represents the flow of service from owner-occupied housing, and it's composed of two main components: depreciation cost and interest cost. The homeownership indicator is a dummy variable that is equal to one if a respondent is a homeowner. All estimates include age as a covariate. Standard errors are clustered at the state level.

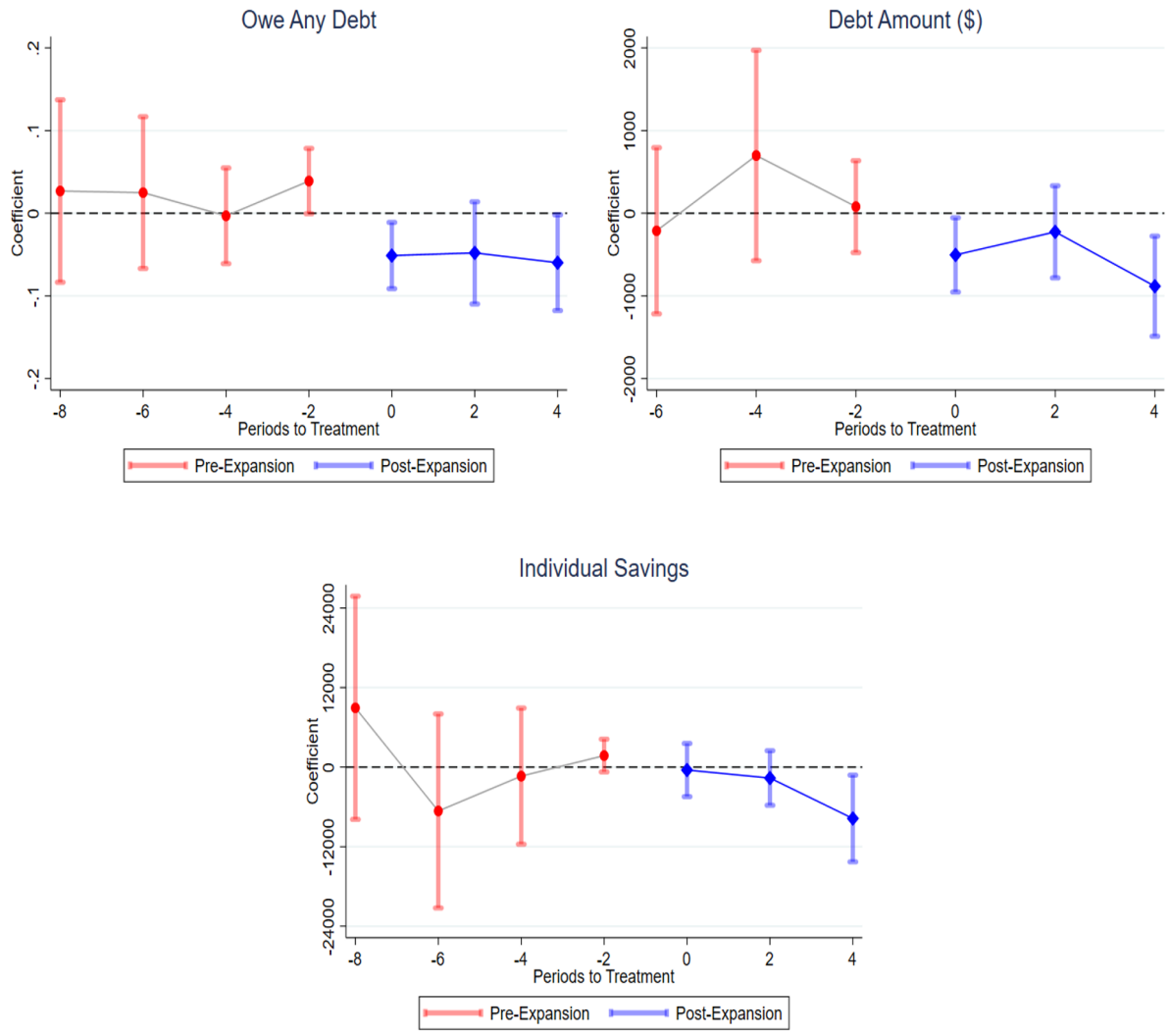

Figure 5: Financial Health & Individual Savings

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. Outstanding debt includes debt from credit card balances, medical debt, life insurance policy loans, and other loans. Individuals savings is the total amount of liquid savings and include balance in checking/savings account, government bonds, bonds, and other savings. All variables are adjusted to 2019 $. The top 1 percentile is also winsorized. Age is included as a covariate. Standard errors are clustered at the state level.

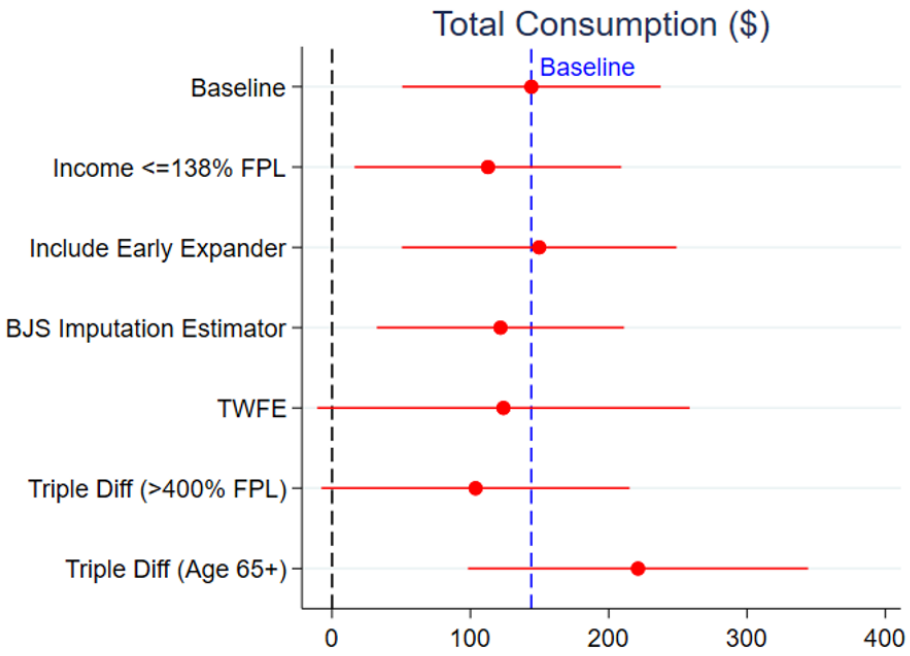

Figure 6: Callaway-Santanna Estimator comparison with other specifications

Notes: This figure plots different total monthly consumption ATT estimates with confidence intervals from different estimators as a comparison to baseline (main specification) point estimates as represented by the red vertical line. Income <=138% FPL refers to restricting the sample of analysis to those with household income less than equal to 138% of FPL before 2014 or who have less than a high school degree. Include Early Expander is similar to the baseline Callaway-Santanna estimator but includes early expander states (VT, DC, DE, MA, and NY). BJS imputation estimator refers to the new estimators described in (Borusyak et al. (2021)). TWFE is the original "Two Way Fixed Effect" estimator. The triple difference models use additional comparison groups: those with household income larger than 400% of FPL before 2014 and those who were 65 and older in 2014.

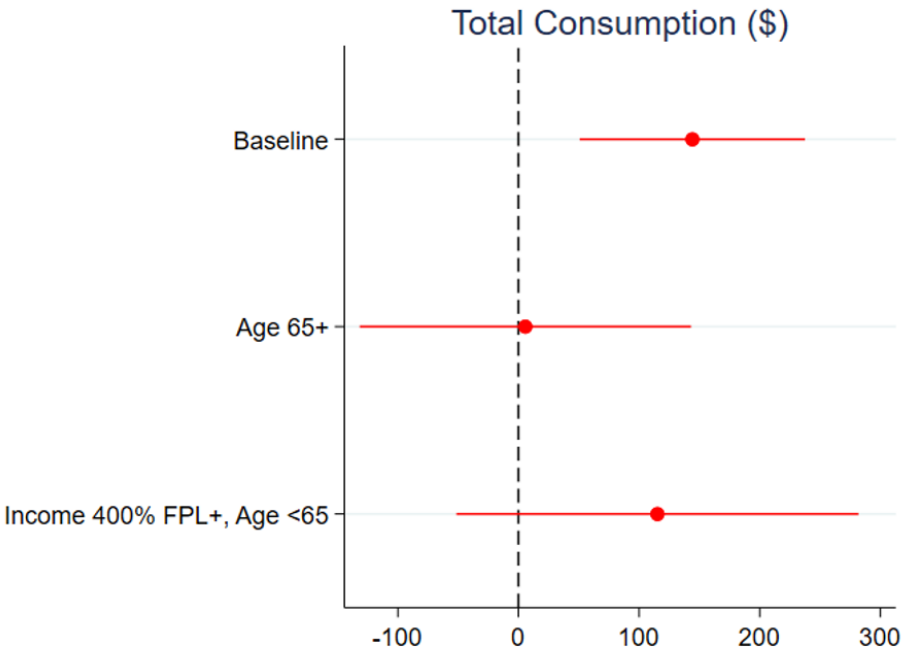

Figure 7: Callaway-Santanna Estimator On Different Subgroups

Notes: This figure plots the Callaway and Sant'Anna (2021)'s estimator on baseline (main specification) and different subgroups as placebo tests. 65+ groups refer to individuals with household income less than 200% of FPL before 2014, who have less than a high school degree, and who were 65 years or older in 2014. The bottom group refers to individuals between 50 and 64 years old in 2014 who have either at least a high school degree or who have household income of more than 400% of FPL before 2014.

A. Appendix Tables

Table A1: Summary Statistics

	Non-Expansion	**Expansion**
Male	0.370	0.399**
	(0.483)	(0.490)
Age at 2014	58.43	58.46
	(5.099)	(5.047)
Less Than Highschool (%)	0.417	0.386**
	(0.493)	(0.487)
Medicaid Coverage	0.172	0.200**
	(0.378)	(0.400)
Uninsured	0.395	0.344***
	(0.489)	(0.475)
Private Health Insurance Coverage	0.339	0.383***
	(0.473)	(0.486)
Employed	0.477	0.475
	(0.500)	(0.499)
Conditional Work Hours	36.557	36.780
	(12.697)	(14.178)
Monthly Wage (Conditional)	2150.242	2342.868***
	(1540.528)	(1957.833)
Observations	3,793	4,024

Notes: Stars imply the difference between expansion and non-expansion is significant. The table presents the mean, with standard deviation in parentheses. The sample for these Summary Statistics comes from RAND HRS from 2006-2012. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. ***p<0.01, **p<0.05, *p<0.1.

Table A2: Summary Statistics: CAMS Module

	Non-Expansion	**Expansion**
Total Consumption	993.626	1003.739
	(1119.248)	(974.288)
Non-durable Spending	536.138	492.913
	(655.192)	(601.411)
Housing Consumption	390.103	434.350
	(590.117)	(512.054)
Transportation Consumption	85.513	89.219
	(125.894)	(122.452)
Total Cons Excl. Housing	603.523	569.388
	(702.170)	(648.417)
Observations	976	1083

Notes: Stars imply the difference between expansion and non-expansion is significant. Tables present the Mean, with the Standard deviation in parentheses. The sample for these Summary statistics comes from the CAMS Module from 2007-2013. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. ***p<0.01, **p<0.05, *p<0.1.

Table A3: Impact on Labor Supply

	(1) Employed	(2) Hours Work	(3) Monthly Wage	(4) Hours Work (Conditional)	(5) Monthly Wage (Conditional)
Coefficients	-0.015	-0.85	-66.48	-0.92*	-148.48*
	(0.015)	(0.52)	(53.67)	(0.54)	(89.75)
Pre-2014 mean	0.44	17.14	943.82	36.79	2229.47
Observations	15,447	15,149	15,448	5,720	6,026

Notes: The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. Hours work are weekly. Columns 4 and 5 are estimates for hours work and wage conditional on being employed. All estimates also include age as a covariate. Standard errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

Table A4: Health Utilization

	(1) Number of Doctor Visit (Last 2 yrs)	(2) Number of Hospital Stay (Last 2 yrs)
Coefficients	0.43	0.048
	(0.31)	(0.044)
Pre-2014 mean	7.59	0.41
Observations	14,233	15,338

Notes: The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. All estimates are aggregate ATT by Callaway and Sant'Anna (2021)'s estimator. Column 1 and 2 indicates the number of doctor visits and hospital stays in the past two years, respectively. All estimates also include age as a covariate. Standard Errors are clustered at the state level. ***p<0.01, **p<0.05, *p<0.1.

B. Appendix Figures

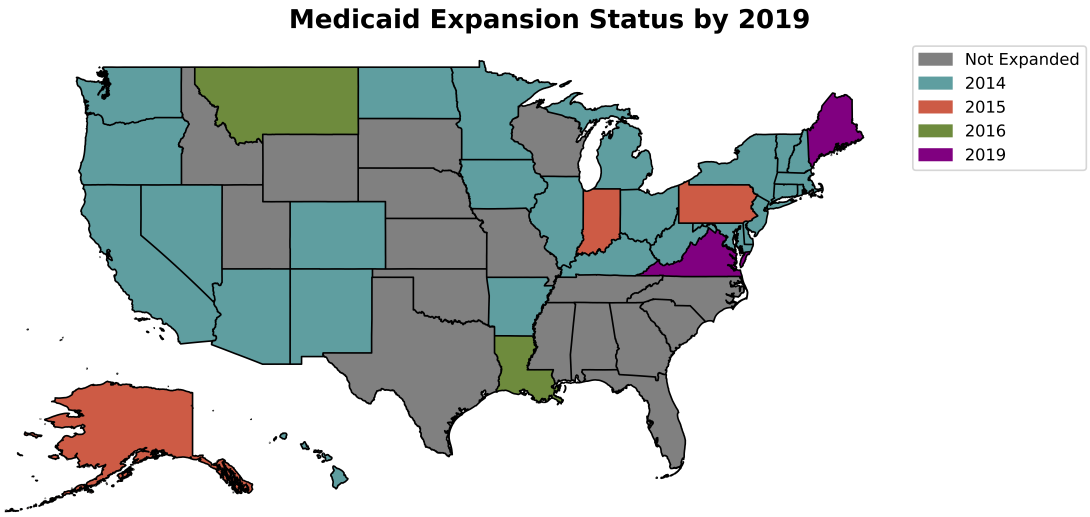

Figure B.1: Expansion Status By 2019

Table 1: Allowable Cost Sharing Amounts for Adults in Medicaid by Income			
	<100% FPL	**100% – 150% FPL**	**>150% FPL**
Outpatient Services	up to $4	up to 10% of state cost	up to 20% of state cost
Non-Emergency use of ER	up to $8	up to $8	No limit
Prescription Drugs	Preferred: up to $4 Non-Preferred: up to $8	Preferred: up to $4 Non-Preferred: up to $8	Preferred: up to $4 Non-Preferred: up to 20% of state cost
Inpatient Services	up to $75 per stay	up to 10% of state cost	up to 20% of state cost

Figure B.2: Medicaid Cost-Sharing

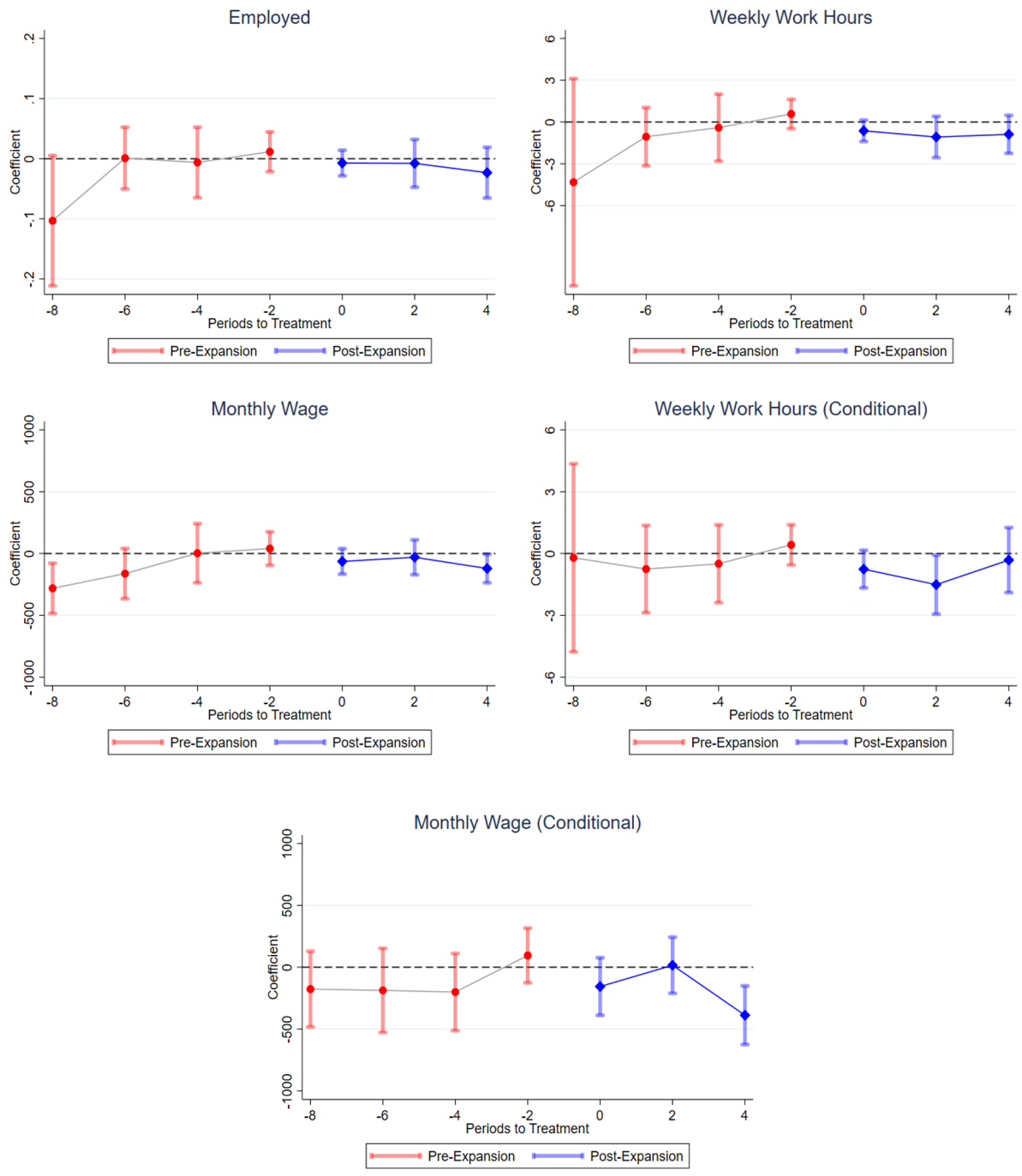

Figure B.3: Labor Supply

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. Employed is a dummy variable that is equal to one if a respondent is employed. All estimates include age as a covariate. Standard errors are clustered at the state level.

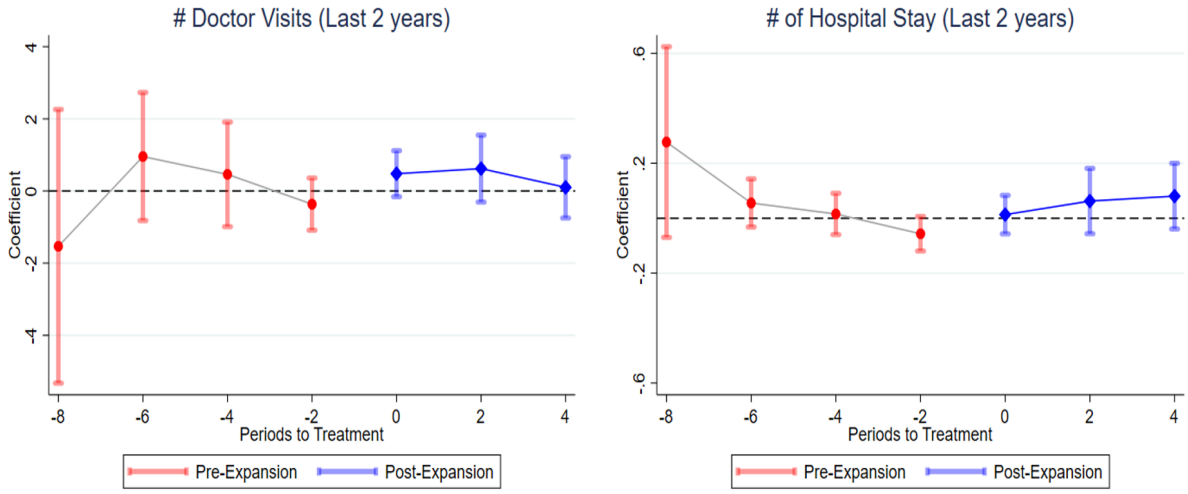

Figure B.4: Healthcare Utilization

Notes: The figure plots coefficients and 95% confidence intervals of biennial indicators leading up to and following the passage of Medicaid expansion, estimated using Callaway and Sant'Anna (2021)'s estimator. The sample of analysis comes from the core survey of the HRS. The sample is defined as individuals between 50 and 64 years old in 2014 and who have either household income up to 200% of FPL before 2014 or less than a high school degree. Each variable indicates the number of doctor visits and hospital stays in the past two years, respectively. All estimates include age as a covariate. Standard errors are clustered at the state level.

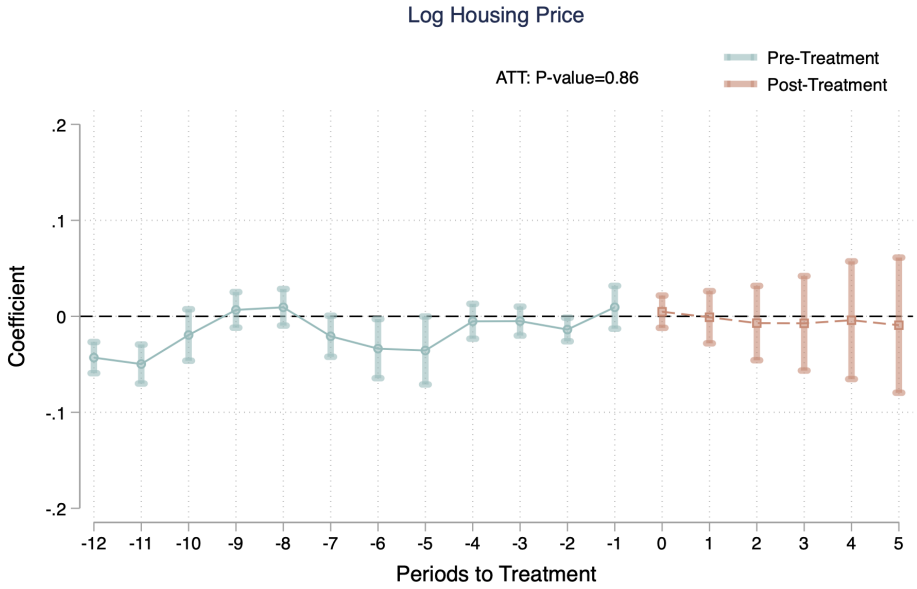

Figure B.5: Log Housing Price

Notes: Graph represents a placebo test of the effect of Medicaid expansion on log housing price. Seasonally adjusted housing price data is extracted from Zillow Housing Value Index data.