Homework 5

ECON 470, Spring 2025

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This assignment analyzes the effects of the Affordable Care Act (ACA), with a particular focus on Medicaid expansion and trends in insurance coverage between 2008 and 2019. Using descriptive graphs, difference-in-differences (DiD) estimation, and two-way fixed effects (TWFE) models, the analysis explores how state-level decisions to expand Medicaid impacted the uninsured rate. The assignment also considers alternative policy explanations for observed trends and provides thoughtful interpretation of the data and results.

If you would like to look into how the analysis was performed, you can find my code here.

Question 1:

Plot the share of the adult population with direct purchase health insurance over time.

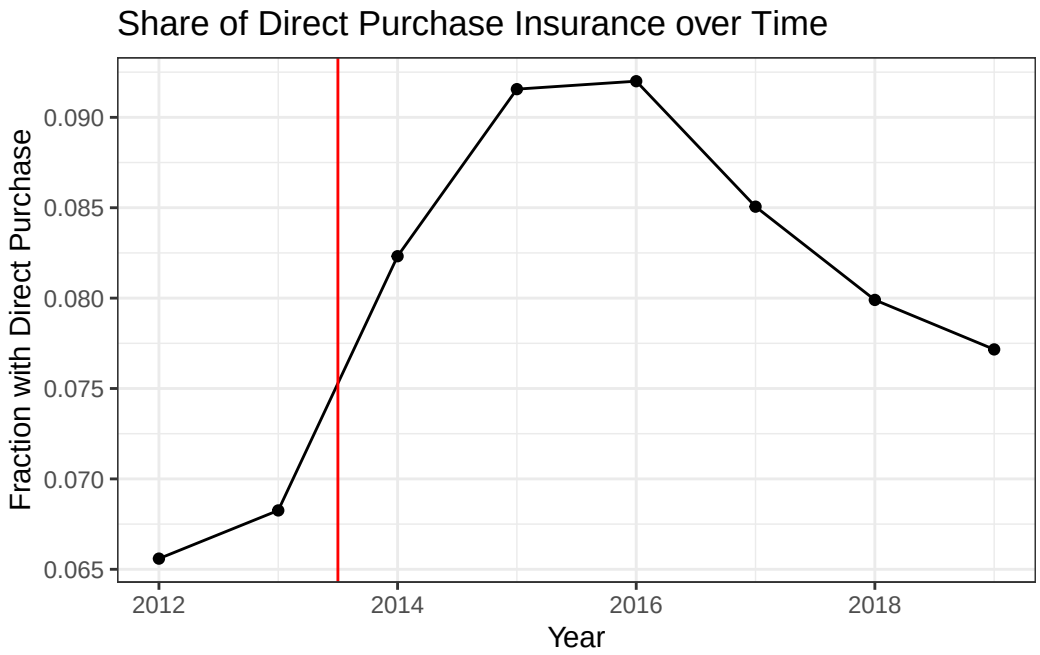


Figure 1 illustrates the steady decline in the share of adults with direct purchase insurance beginning around 2016.

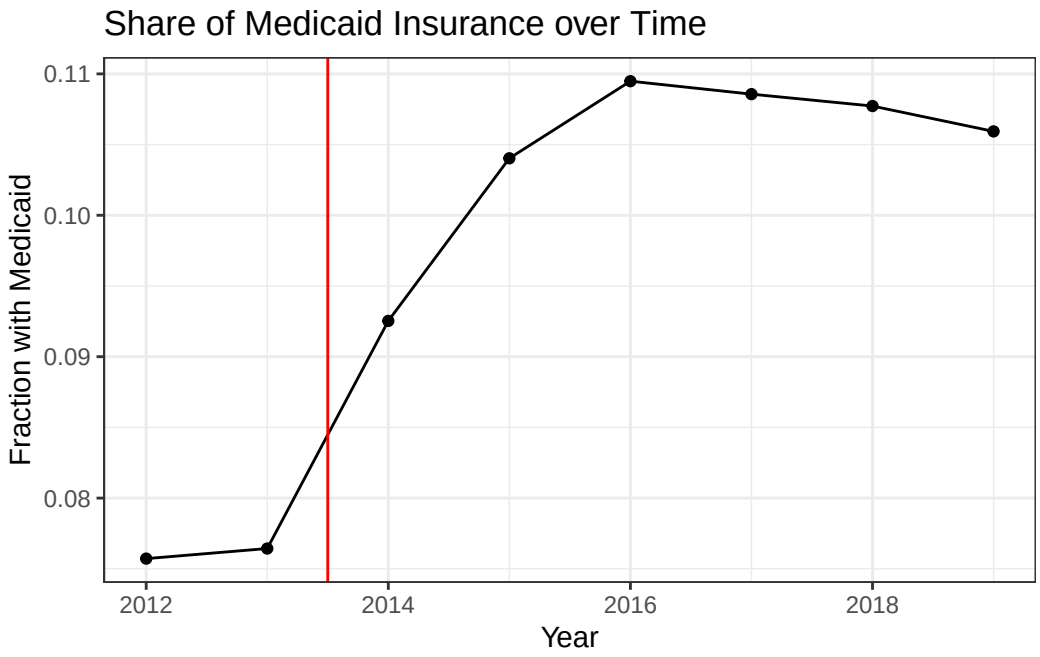
Question 2:

Discuss the reduction in direct purchase health insurance in later years. Can you list a couple of policies that might have affected the success of the direct purchase insurance market?

The reduction in direct purchase health insurance in the later years can be credited to policies that affected that market. In 2017, the Trump administration cut off Cost-Sharing Reduction (CSR) payments. These CSR payments were federal government reimbursment to insurers for providing discounts to help lower out-of-pocket costs for low-income individuals on ACA marketplaces. However, with the repeal of this program, insurers didn't offer the same discounts anymore, thus raising premiums which made coverage less appealing. Also in 2017, the penalty for being uninsured went to 0, which could've led to healthy individuals opting to not purchase health insurance.

Question 3:

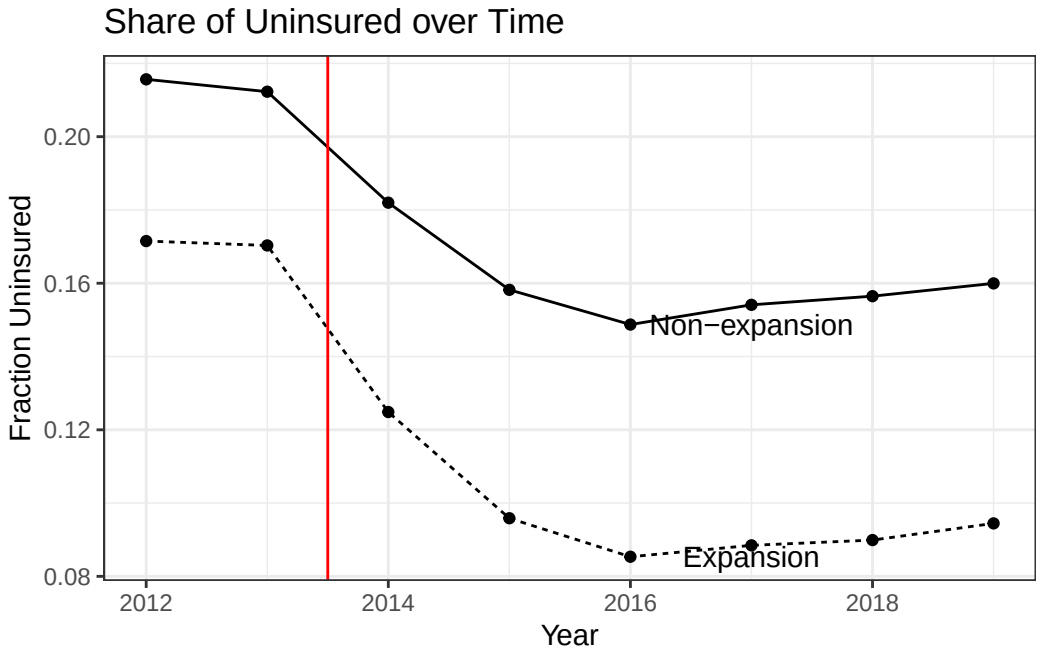
Plot the share of the adult population with Medicaid over time.



The share of adults with Medicaid coverage rose sharply starting in 2014, consistent with the implementation of Medicaid expansion under the ACA in many states

Question 4:

Plot the share of uninsured over time, separately by states that expanded Medicaid in 2014 versus those that did not. Drop all states that expanded after 2014.



The uninsured rate declined more rapidly in states that expanded Medicaid in 2014, highlighting the immediate effect of expansion. Non-expansion states saw a more modest decline.

Estimating ATEs

Question 5:

Calculate the average percent of uninsured individuals in 2012 and 2015, separately for expansion and non-expansion states. Present your results in a basic 2x2 DD table.

Table 1: DD Table for Medicaid Expansion

Group	Pre	Post
Non-expansion	0.22	0.16
Expansion	0.17	0.10

Question 6:

Estimate the effect of Medicaid expansion on the uninsurance rate using a standard DD regression estimator, again focusing only on states that expanded in 2014 versus those that never expanded.

	(1)
(Intercept)	0.214
	(0.007)
Post 2014	-0.054
	(0.008)
Expand	-0.043
	(0.009)
Post 2014:Expand	-0.020
	(0.010)
Num.Obs.	344
R2	0.508
RMSE	0.04

Question 7:

Include state and year fixed effects in your estimates. Try using the lfe or fixest package to estimate this instead of directly including the fixed effects.

	Standard DD	TWFE
(Intercept)	0.214	
	(0.007)	
Post 2014	-0.054	
	(0.008)	
Expand	-0.043	
	(0.009)	
Post 2014:Expand	-0.020	
	(0.010)	
post::TRUE:expand_ever		-0.020
		(0.007)
Num.Obs.	344	344
R2	0.508	0.952
R2 Within		0.106
RMSE	0.04	0.01
Std.Errors		by: State

Question 8:

Repeat the analysis in question 7 but include all states (even those that expanded after 2014). Are your results different? If so, why?

	Standard DD	TWFE	Time-varying Treatment
(Intercept)	0.214		
	(0.007)		
Post 2014	-0.054		
	(0.008)		
Expand	-0.043		
	(0.009)		
Post 2014:Expand	-0.020		
	(0.010)		
post::TRUE:expand_ever		-0.020	
		(0.007)	
Post x Expand			-0.023
			(0.005)
Num.Obs.	344	344	400
R2	0.508	0.952	0.950
R2 Within		0.106	0.155
RMSE	0.04	0.01	0.01
Std.Errors		by: State	by: State

When including states that expanded Medicaid after 2014, we see that estimated treatment effect changes, becoming smaller or statistically insignificant. This difference happens because treatment timing becomes staggered, violating the parallel trends assumption underpinning basic Difference-in-Differences (DiD) estimators. States that expanded in different years may have had different baseline trends or experienced policy effects at different times, diluting the estimated average treatment effect when lumped together. Without properly accounting for treatment timing (for example, via event study or staggered DiD models), the estimate loses precision and interpretability.

Question 9:

Provide an "event study" graph showing the effects of Medicaid expansion in each year. Use the specification that includes state and year fixed effects, limited to states that expanded in 2014 or never expanded.

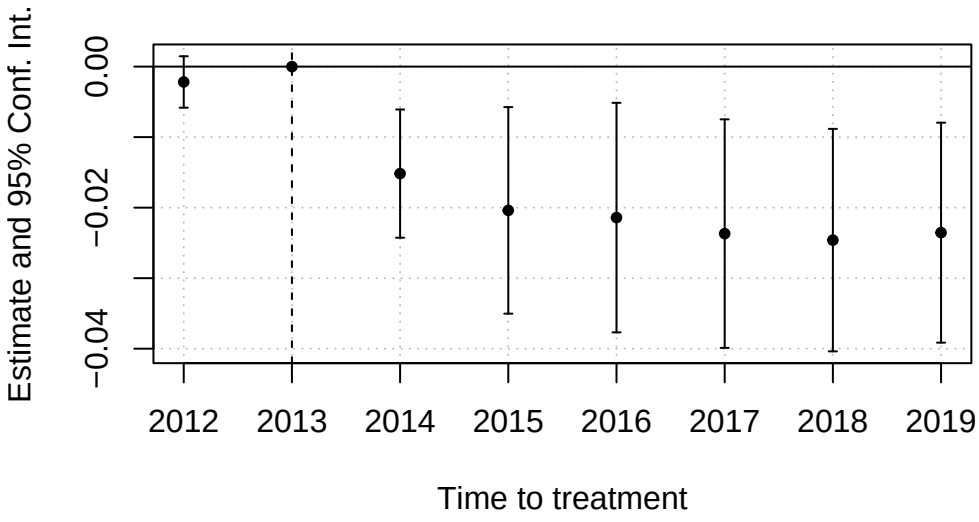


Figure 1: Event Study with Common Treatment Time

Question 10:

Repeat part 9 but again include states that expanded after 2014. Note: this is tricky…you need to put all states onto "event time" to create this graph.

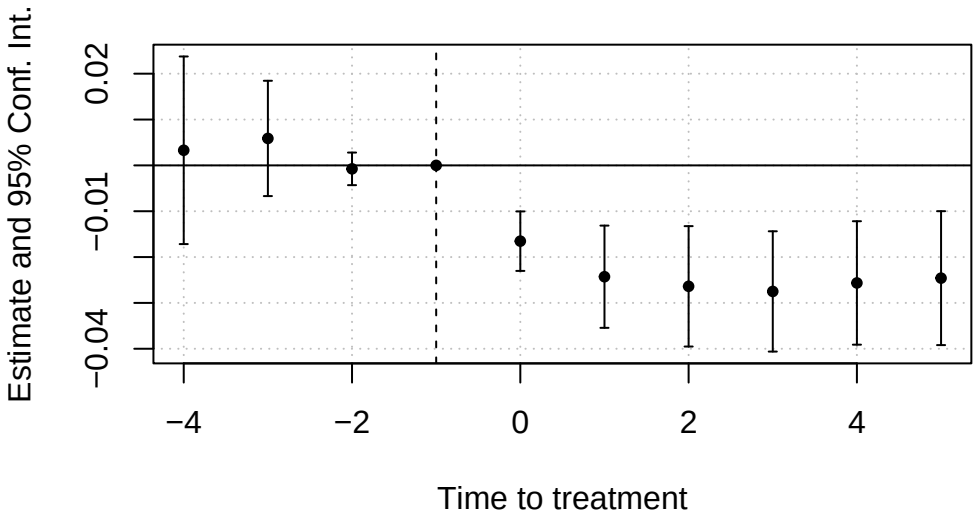


Figure 2: Event Study with Staggered Treatment