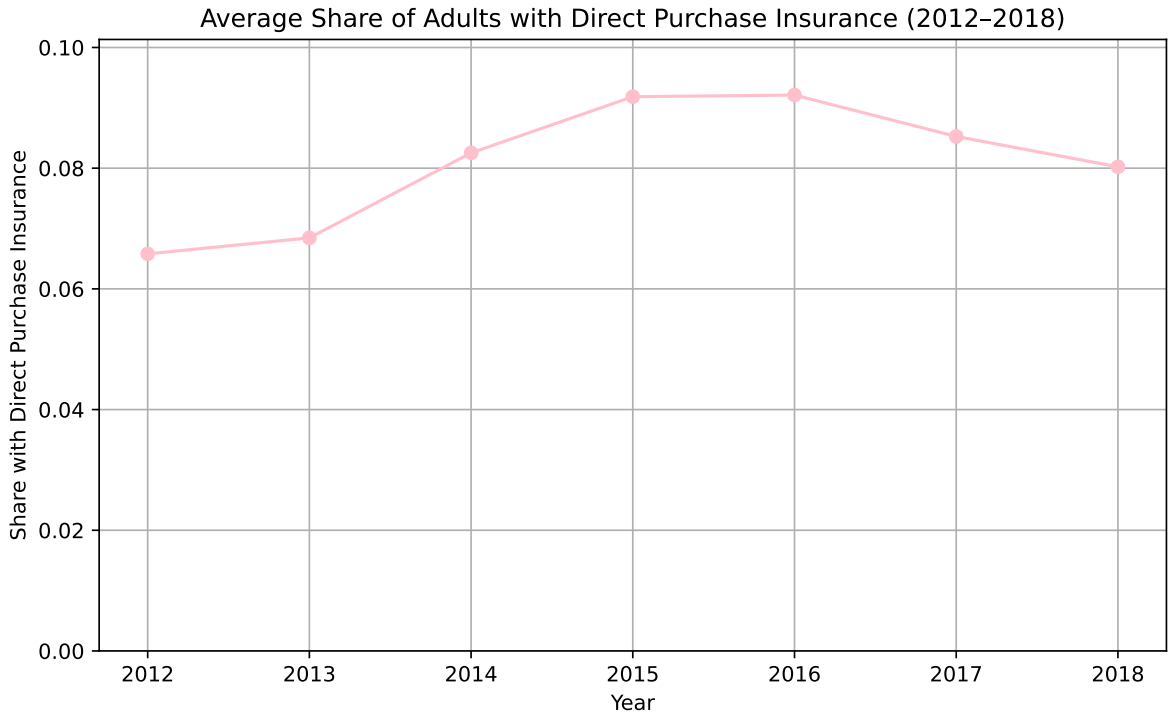
ECON 470 Homework 5-1

Ellen Wu

The link to my repository: https://github.com/ellenwu-git/homework5

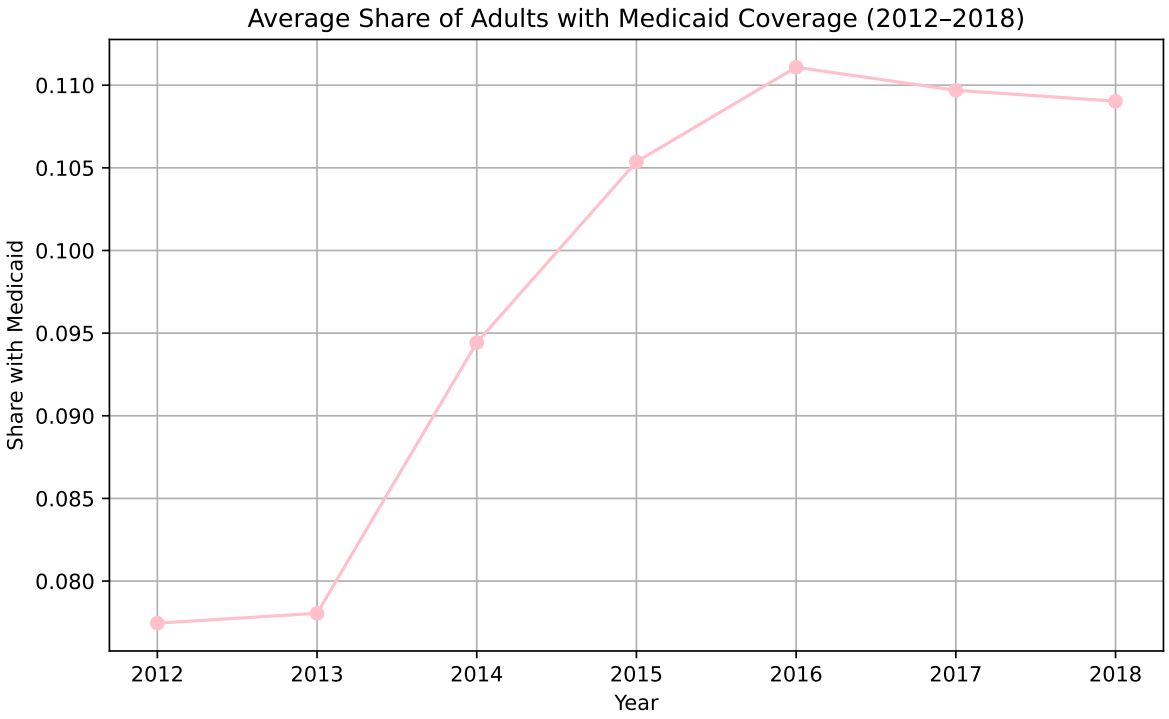
1.Plot the share of the adult population with direct purchase health insurance over time.



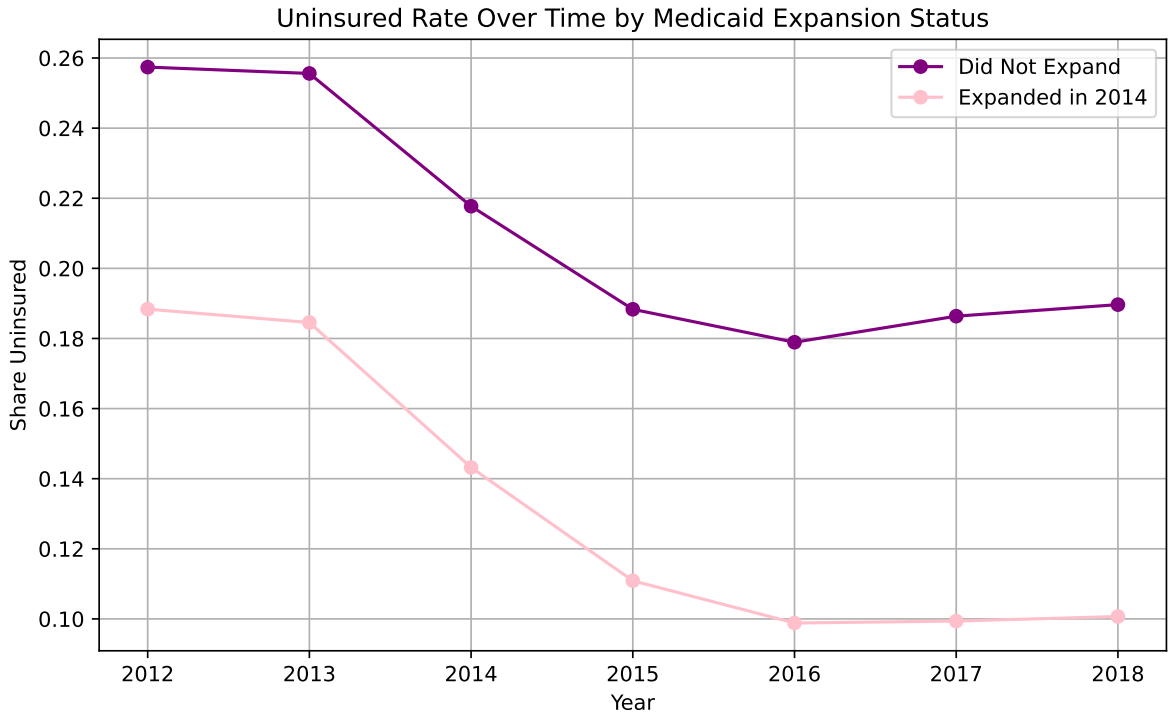
2. Discuss the reduction in direct purchase health insurance in later years. Can you list a couple of policies that might have affected the success of the direct purchase insurance market?

In later years, the share of adults with direct-purchase health insurance declined after peaking during the initial rollout of the ACA exchanges. Two major policy changes likely contributed to this drop. First, the repeal of the individual mandate penalty in 2019 reduced the incentive for healthy individuals to purchase insurance, weakening risk pools. Second, the termination of cost-sharing reduction payments in 2017 led insurers to raise premiums, making plans less affordable for many. These shifts undermined the stability of the individual market and reduced participation.

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



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.



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.

```
Q5: Difference-in-Differences Table (Uninsurance Rates)
year              2012      2015   Change
group
Expanded      0.188364  0.110884 -0.07748
Not Expanded  0.257413  0.188323 -0.06909

Estimated ATE (Difference-in-Differences): -0.0084
```

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.

```
                            OLS Regression Results
==============================================================================
Dep. Variable:         uninsured_rate   R-squared:                       0.387
Model:                            OLS   Adj. R-squared:                  0.382
Method:                 Least Squares   F-statistic:                     74.20
Date:                Tue, 22 Apr 2025   Prob (F-statistic):           3.10e-37
Time:                        10:27:10   Log-Likelihood:                 599.22
No. Observations:                 357   AIC:                            -1190.
Df Residuals:                     353   BIC:                            -1175.
Df Model:                           3
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
Intercept      0.2229      0.010     21.951      0.000       0.203       0.243
treatment     -0.0444      0.011     -3.917      0.000      -0.067      -0.022
post          -0.0569      0.012     -4.737      0.000      -0.081      -0.033
interaction   -0.0101      0.013     -0.755      0.451      -0.036       0.016
==============================================================================
Omnibus:                        2.103   Durbin-Watson:                   1.820
Prob(Omnibus):                  0.349   Jarque-Bera (JB):                2.018
Skew:                           0.116   Prob(JB):                        0.365
Kurtosis:                       2.713   Cond. No.                         15.1
==============================================================================

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Estimated ATE (DiD Regression across all years): -0.0101
```

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.

OLS Regression Results

Dep. Variable:	uninsured_rate	R-squared:	0.943
Model:	OLS	Adj. R-squared:	0.932
Method:	Least Squares	F-statistic:	86.74
Date:	Tue, 22 Apr 2025	Prob (F-statistic):	2.83e-155
Time:	10:27:10	Log-Likelihood:	1023.2
No. Observations:	357	AIC:	-1930.
Df Residuals:	299	BIC:	-1706.
Df Model:	57		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025
Intercept	0.2093	0.007	32.051	0.000	0.196
C(State)[T.Alaska]	0.0427	0.009	4.935	0.000	0.026
C(State)[T.Arizona]	0.0142	0.009	1.640	0.102	-0.003
C(State)[T.Arkansas]	0.0038	0.009	0.439	0.661	-0.013
C(State)[T.California]	-0.0048	0.009	-0.552	0.582	-0.022
C(State)[T.Colorado]	-0.0261	0.009	-3.021	0.003	-0.043
C(State)[T.Connecticut]	-0.0666	0.009	-7.697	0.000	-0.084
C(State)[T.Delaware]	-0.0635	0.009	-7.347	0.000	-0.081
C(State)[T.District of Columbia]	-0.1005	0.009	-11.628	0.000	-0.118
C(State)[T.Florida]	0.0573	0.008	7.121	0.000	0.041
C(State)[T.Georgia]	0.0448	0.008	5.571	0.000	0.029
C(State)[T.Hawaii]	-0.0910	0.009	-10.519	0.000	-0.108
C(State)[T.Idaho]	0.0232	0.009	2.681	0.008	0.006
C(State)[T.Illinois]	-0.0313	0.009	-3.625	0.000	-0.048
C(State)[T.Indiana]	-0.0165	0.009	-1.904	0.058	-0.033
C(State)[T.Iowa]	-0.0764	0.009	-8.836	0.000	-0.093
C(State)[T.Kansas]	-0.0243	0.008	-3.024	0.003	-0.040
C(State)[T.Kentucky]	-0.0417	0.009	-4.827	0.000	-0.059
C(State)[T.Louisiana]	0.0230	0.009	2.661	0.008	0.006
C(State)[T.Maine]	-0.0297	0.009	-3.436	0.001	-0.047
C(State)[T.Maryland]	-0.0556	0.009	-6.427	0.000	-0.073
C(State)[T.Massachusetts]	-0.1168	0.009	-13.510	0.000	-0.134
C(State)[T.Michigan]	-0.0515	0.009	-5.957	0.000	-0.069
C(State)[T.Minnesota]	-0.0854	0.009	-9.878	0.000	-0.102
C(State)[T.Mississippi]	0.0395	0.008	4.905	0.000	0.024

C(State)[T.Missouri]	-0.0082	0.009	-0.943	0.347	-0.025
C(State)[T.Montana]	0.0103	0.009	1.187	0.236	-0.007
C(State)[T.Nebraska]	-0.0285	0.009	-3.291	0.001	-0.045
C(State)[T.Nevada]	0.0367	0.009	4.241	0.000	0.020
C(State)[T.New Hampshire]	-0.0496	0.009	-5.731	0.000	-0.067
C(State)[T.New Jersey]	-0.0219	0.009	-2.532	0.012	-0.039
C(State)[T.New Mexico]	0.0263	0.009	3.040	0.003	0.009
C(State)[T.New York]	-0.0503	0.009	-5.821	0.000	-0.067
C(State)[T.North Carolina]	0.0225	0.009	2.606	0.010	0.006
C(State)[T.North Dakota]	-0.0564	0.009	-6.526	0.000	-0.073
C(State)[T.Ohio]	-0.0503	0.009	-5.814	0.000	-0.067
C(State)[T.Oklahoma]	0.0575	0.009	6.654	0.000	0.041
C(State)[T.Oregon]	-0.0241	0.009	-2.788	0.006	-0.041
C(State)[T.Pennsylvania]	-0.0603	0.009	-6.970	0.000	-0.077
C(State)[T.Rhode Island]	-0.0627	0.009	-7.253	0.000	-0.080
C(State)[T.South Carolina]	0.0181	0.008	2.251	0.025	0.002
C(State)[T.South Dakota]	-0.0174	0.009	-2.014	0.045	-0.034
C(State)[T.Tennessee]	-0.0043	0.008	-0.534	0.594	-0.020
C(State)[T.Texas]	0.0890	0.008	11.064	0.000	0.073
C(State)[T.Utah]	-0.0132	0.009	-1.527	0.128	-0.030
C(State)[T.Vermont]	-0.0887	0.009	-10.258	0.000	-0.106
C(State)[T.Virginia]	-0.0195	0.009	-2.253	0.025	-0.037
C(State)[T.Washington]	-0.0343	0.009	-3.972	0.000	-0.051
C(State)[T.West Virginia]	-0.0303	0.009	-3.501	0.001	-0.047
C(State)[T.Wisconsin]	-0.0744	0.008	-9.245	0.000	-0.090
C(State)[T.Wyoming]	0.0022	0.008	0.268	0.789	-0.014
C(year)[T.2013]	-0.0024	0.003	-0.795	0.427	-0.008
C(year)[T.2014]	-0.0311	0.005	-6.677	0.000	-0.040
C(year)[T.2015]	-0.0584	0.005	-12.562	0.000	-0.068
C(year)[T.2016]	-0.0693	0.005	-14.906	0.000	-0.078
C(year)[T.2017]	-0.0663	0.005	-14.255	0.000	-0.075
C(year)[T.2018]	-0.0654	0.005	-14.072	0.000	-0.075
interaction	-0.0101	0.004	-2.277	0.023	-0.019

Omnibus:	6.135	Durbin-Watson:	1.990
Prob(Omnibus):	0.047	Jarque-Bera (JB):	7.533
Skew:	0.157	Prob(JB):	0.0231
Kurtosis:	3.638	Cond. No.	70.8

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

```
Estimated ATE (DiD interaction effect): -0.0101
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8. Repeat the analysis in question 7 but include all states (even those that expanded after 2014). Are your results different? If so, why?

Q8: DiD Regression with All States and Years Included (w/ FE)

OLS Regression Results

Dep. Variable:	uninsured_rate	R-squared:	0.943
Model:	OLS	Adj. R-squared:	0.932
Method:	Least Squares	F-statistic:	86.74
Date:	Tue, 22 Apr 2025	Prob (F-statistic):	2.83e-155
Time:	10:27:10	Log-Likelihood:	1023.2
No. Observations:	357	AIC:	-1930.
Df Residuals:	299	BIC:	-1706.
Df Model:	57		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025
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interaction	-0.0101	0.004	-2.277	0.023	-0.019

Omnibus:	6.135	Durbin-Watson:	1.990
Prob(Omnibus):	0.047	Jarque-Bera (JB):	7.533
Skew:	0.157	Prob(JB):	0.0231
Kurtosis:	3.638	Cond. No.	70.8

Notes:

```
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

Estimated ATE (All States, w/ FE): -0.0101
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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.

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.