Homework 3

Research Methods, Spring 2025

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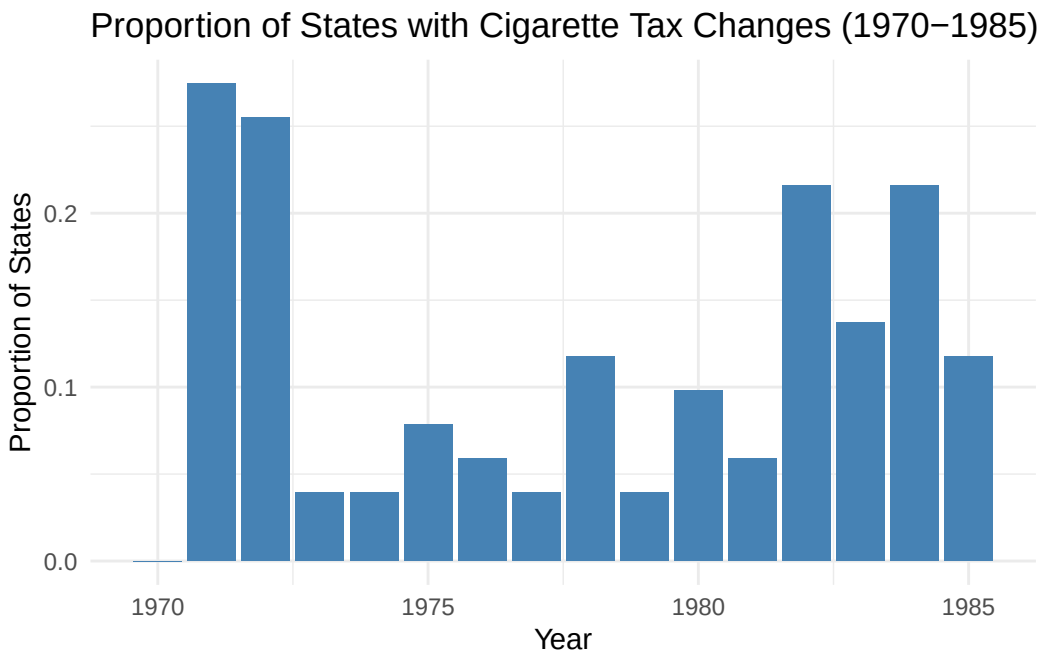
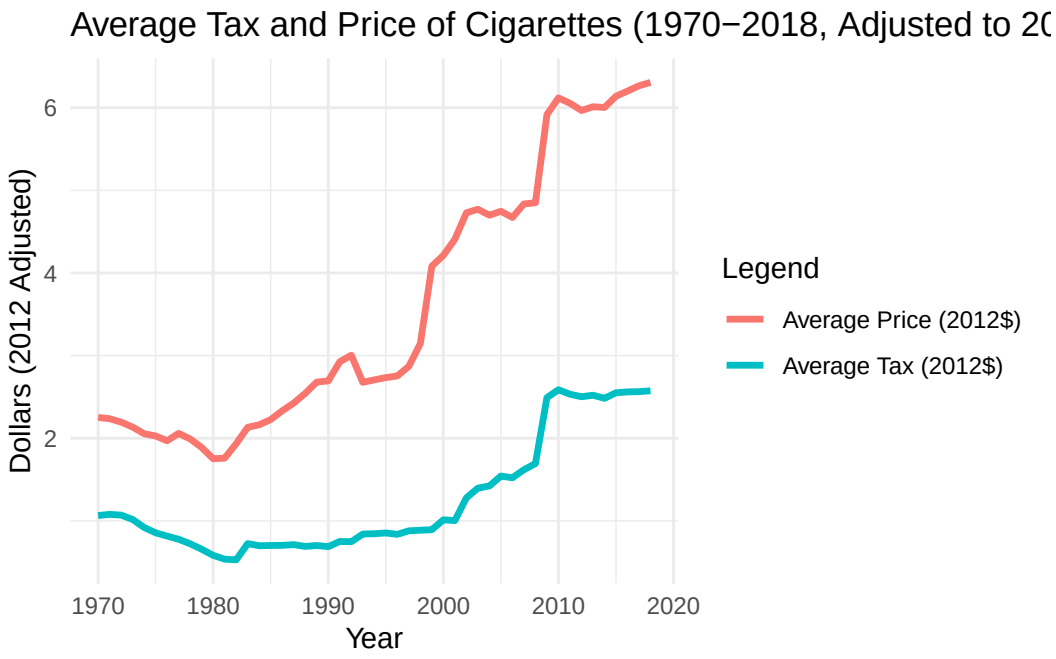
My answers to the homework questions are described below. The GitHub repository for this work is available here. Enjoy!

1. Present a bar graph showing the proportion of states with a change in their cigarette tax in each year from 1970 to 1985.

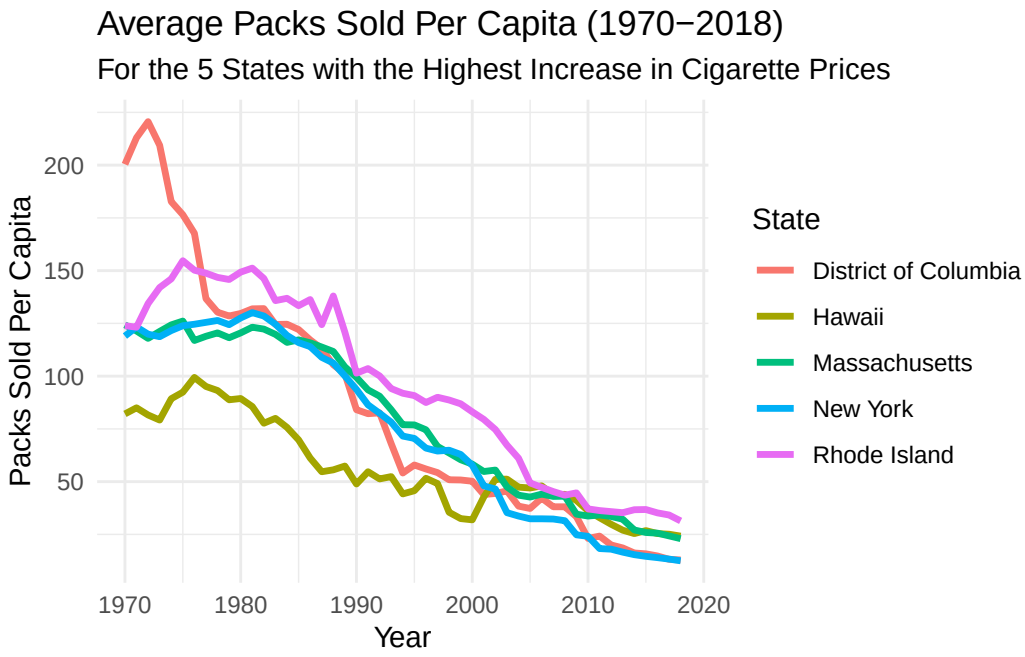


2. Plot on a single graph the average tax (in 2012 dollars) on cigarettes and the average price of a pack of cigarettes from 1970 to 2018.

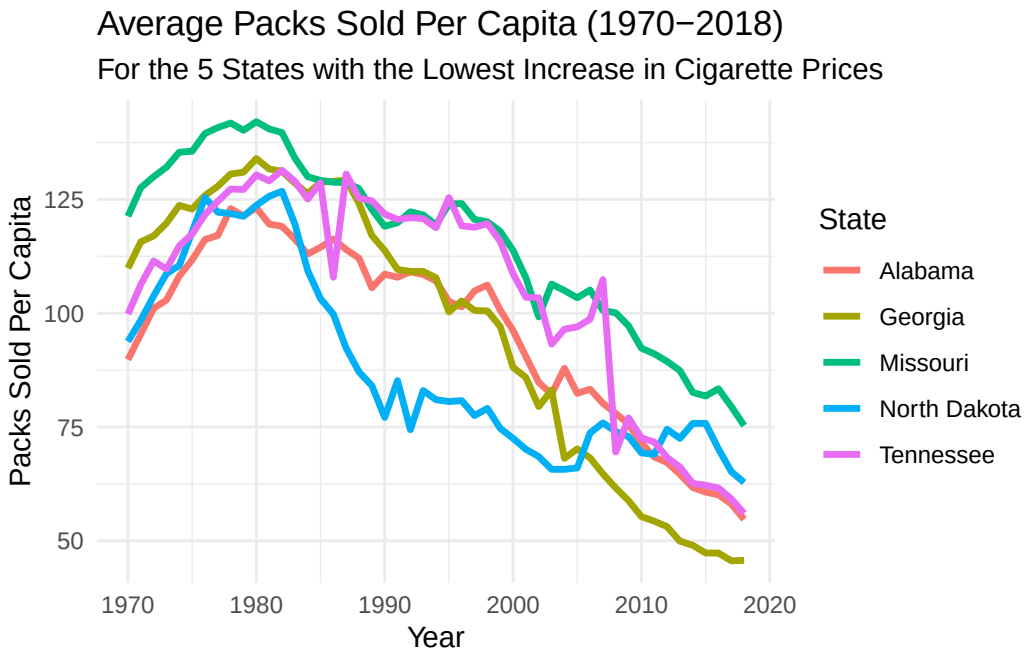
```
Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
i Please use `linewidth` instead.
```



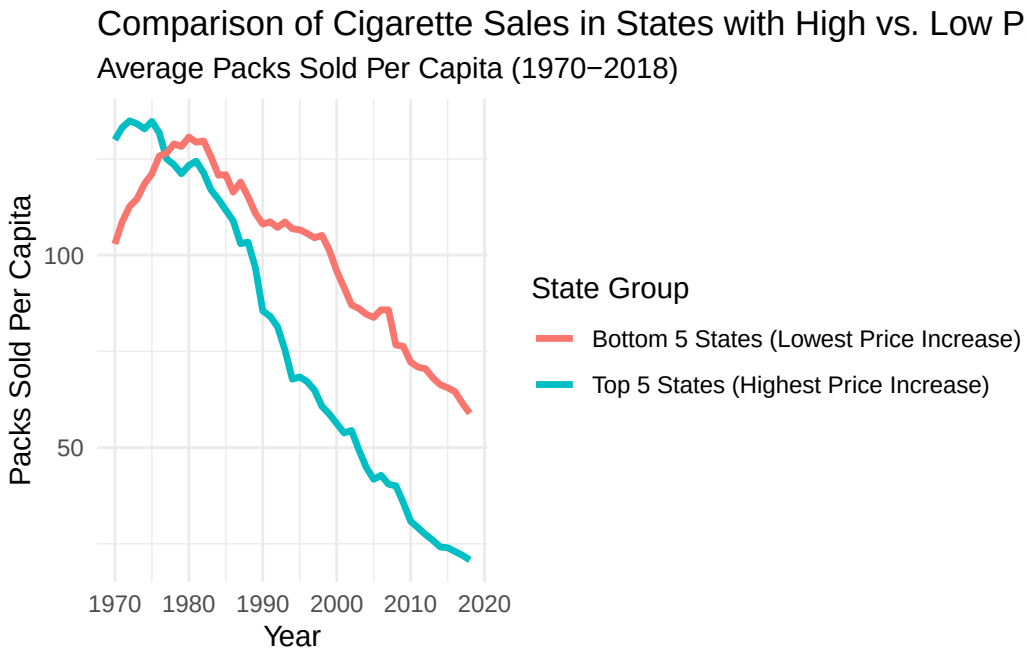
3. Identify the 5 states with the highest increases in cigarette prices (in dollars) over the time period. Plot the average number of packs sold per capita for those states from 1970 to 2018.



4. Identify the 5 states with the lowest increases in cigarette prices over the time period. Plot the average number of packs sold per capita for those states from 1970 to 2018.



5. Compare the trends in sales from the 5 states with the highest price increases to those with the lowest price increases.



6-9. The estimates for the regressions run in questions 6-9 are shown in the table below.

Regression Estimates (OLS, IV, Reduced Form, First Stage)
1970-1990 and 1991-2015

	1970-1990				1991-2015			
	OLS	IV	Reduced Form	First Stage	OLS	IV	Reduced Form	First
Log Price	-0.809***	-0.796***			-0.997***	-1.150***		
	(0.038)	(0.071)			(0.025)	(0.028)		
Log Tax			-0.207***	0.260***			-0.591***	0.51
			(0.021)	(0.012)			(0.013)	(0.
Num. Obs.	1071	1071	1071	1071	1275	1275	1275	12
R^2	0.294	0.294	0.082	0.290	0.561	0.548	0.607	0.

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

10. Compare your elasticity estimates from 1970-1990 versus those from 1991-2015. Are they different? If so, why?