Homework 3

Research Methods, Spring 2025

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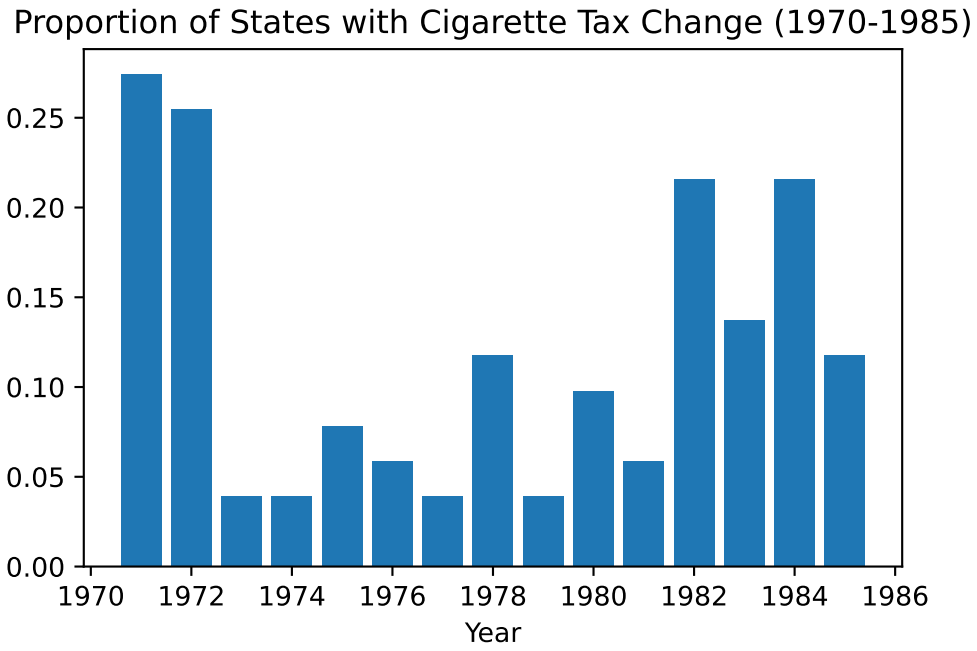
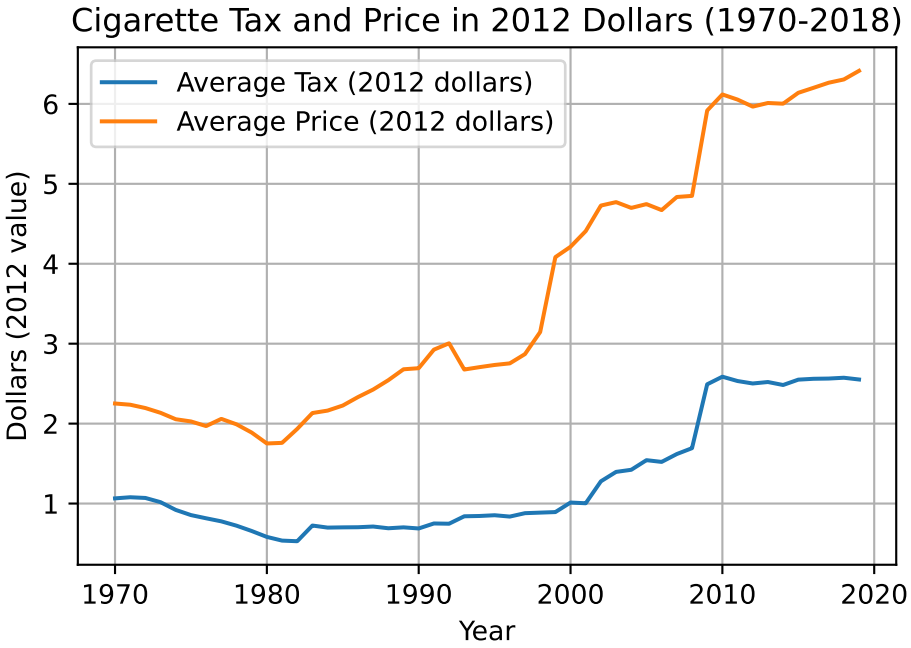
You can access the Repository

1 Bar Graph

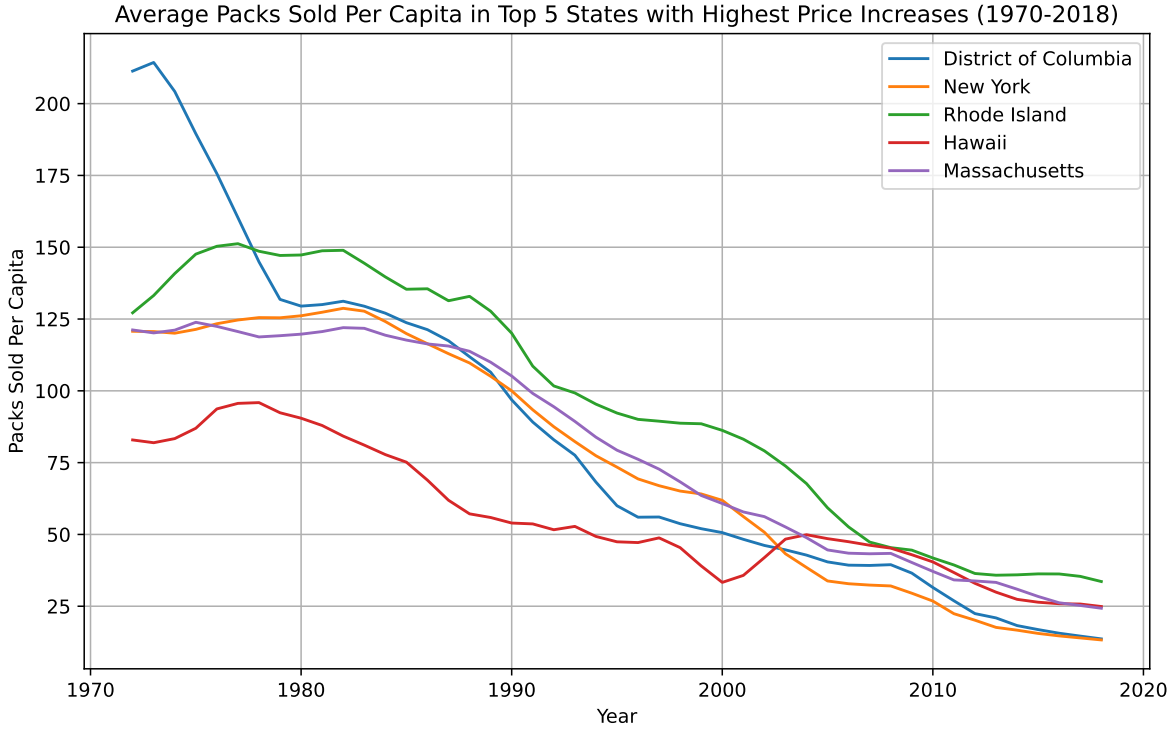


2


Cigarette Tax and Price in 2012 Dollars (1970-2018)
Average Tax (2012 dollars)
Average Price (2012 dollars)
Dollars (2012 value)
1
2
3
4
5
6
1970
1980
1990
2000
2010
2020
Year

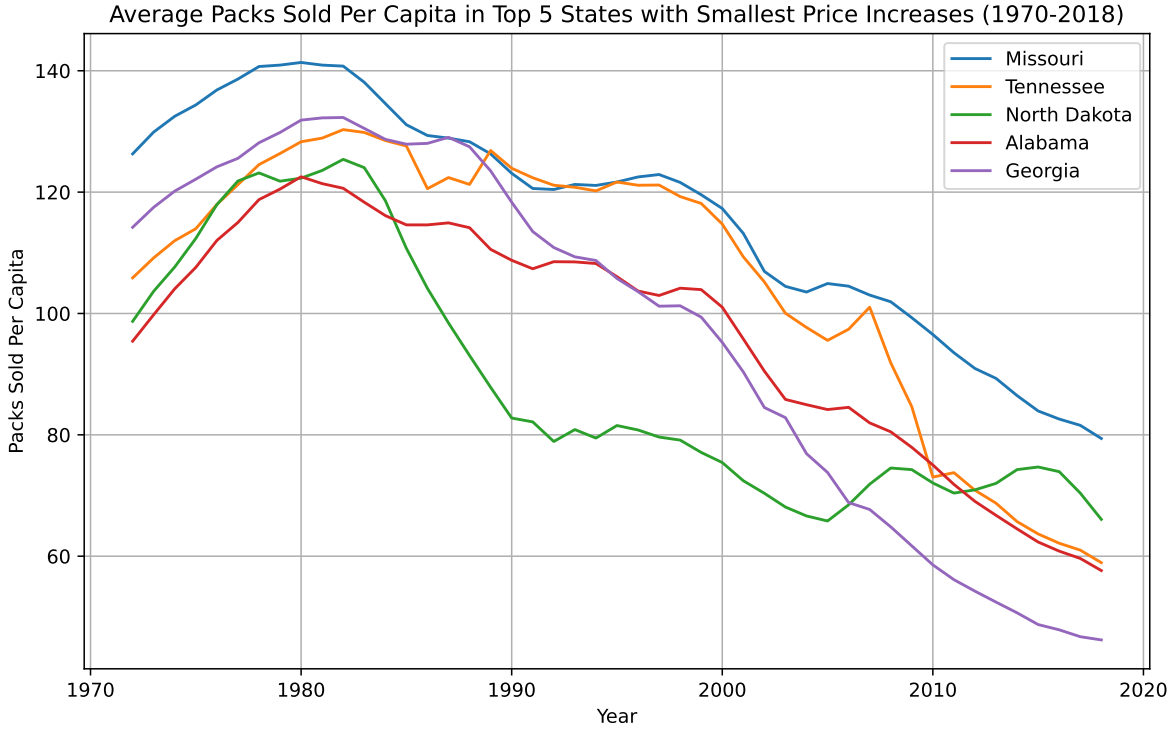
3

5 highest states in legend

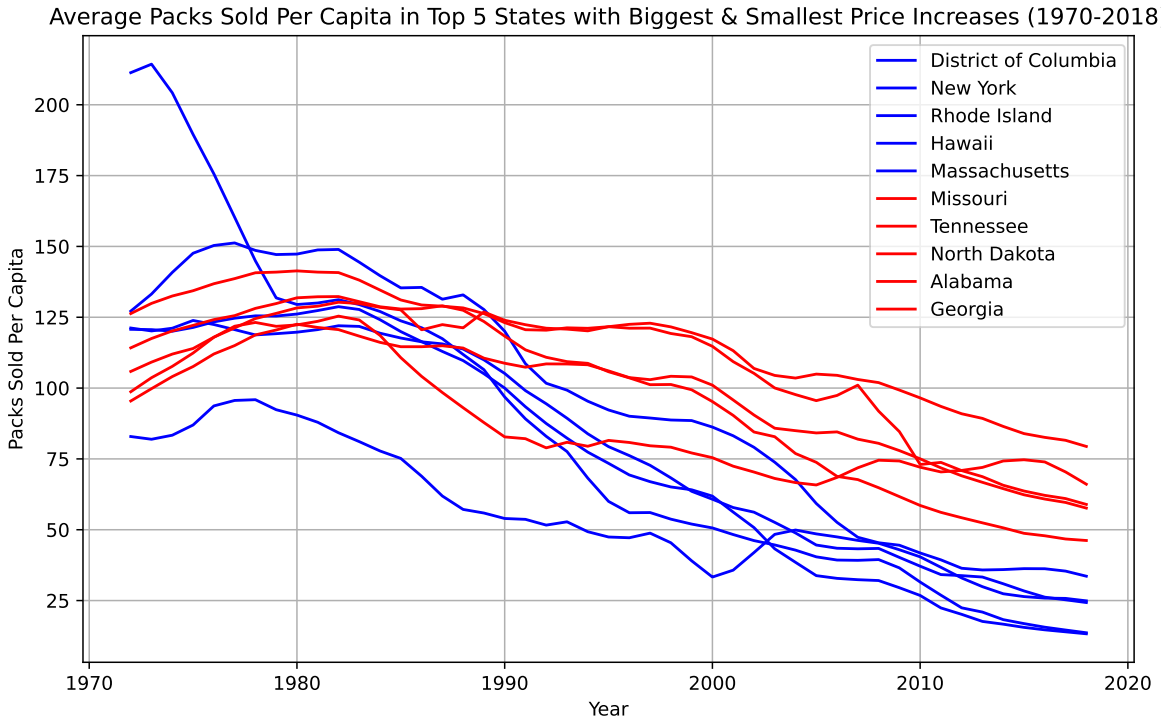


4

5 lowest states in legend



5



Both start with similar sales per capita, but the states with the highest price increases have a steeper decline in sales per capita compared to the states with the smallest price increases. You can see this as they all end with a lower number of packs sold per capita than all the red(low price increase) states. This suggests that significant price increases do decrease cigarette sales per capita further. I like this graph more than the mean to show it is not just an average effect due to outlier but a comprehensive trend and the graph is still very clear with the colors.

7-10

Elasticity Estimates from OLS and IV Models

	1970 - 1990		1991 - 2015	
	OLS	IV	OLS	IV
Log Price	-0.809	-0.796	-0.997	-1.15
Standard Error	(0.038)	(0.071)	(0.025)	(0.028)
N	1071	1071	1275	1275
R2	0.294	NaN	0.561	NaN
REDUCED FORM				
Log Tax		-0.207		-0.591
Standard Error		(0.021)		(0.013)
N		1071		1275
R2		0.082		0.607
FIRST STAGE				
Log Tax		0.26		0.514
Standard Error		(0.012)		(0.007)
N		1071		1275
R2		0.29		0.812

Question 7. The value of OLS without the instrument is -0.809 and with the instrument is -0.796. This means that a 1% increase in price will decrease sales per capita by 0.81% or 0.80%. They are different but barely and this could due to the endogeneity in the intial ols estimate. For example a state could increase the tax rate because it already has a high smoking rate, and this would bias the estimate.

Question 10. Both years have different OLS and IV estimates. This is due to the same issues of endogeneity in both time periods. However, the IV estimate for the first time period decreases the elasticity effect, while it increases in the IV estimate in the second time period. This could be due to the fact that the taxes increased more steaply in the second time period and have a stronger effect while taxes do not move much in the first time period. Another explaination for a higher elasticity in the second time period (less addictive/ more price sensitive) could be that cultural values have shifted due to more education on the health risks of smoking or preferences. Another explanation could be that increases access to alternative like E-cigarettes or other smoking cessation products. All of these could effect the elasticity estimates.