Homework 3

Research Methods, Spring 2025

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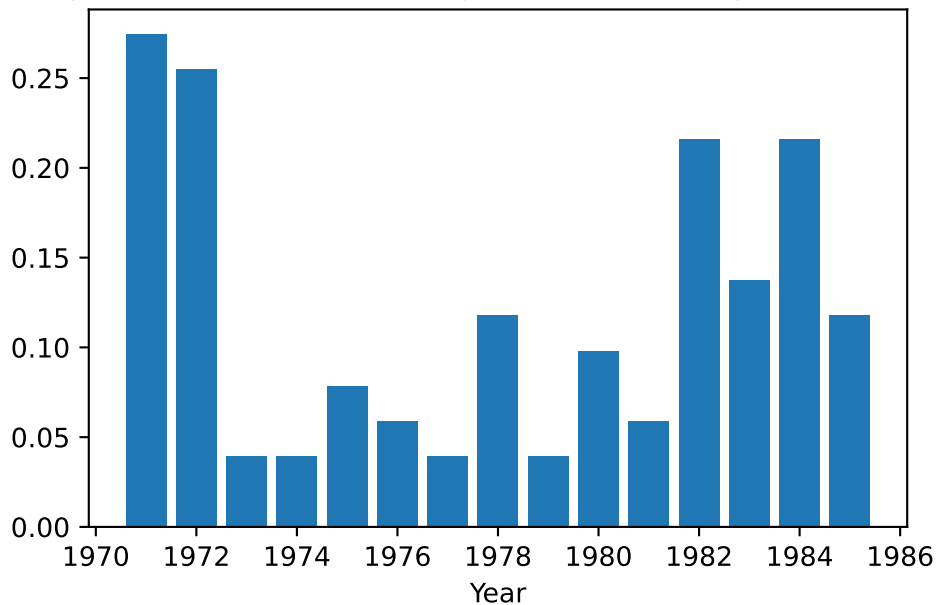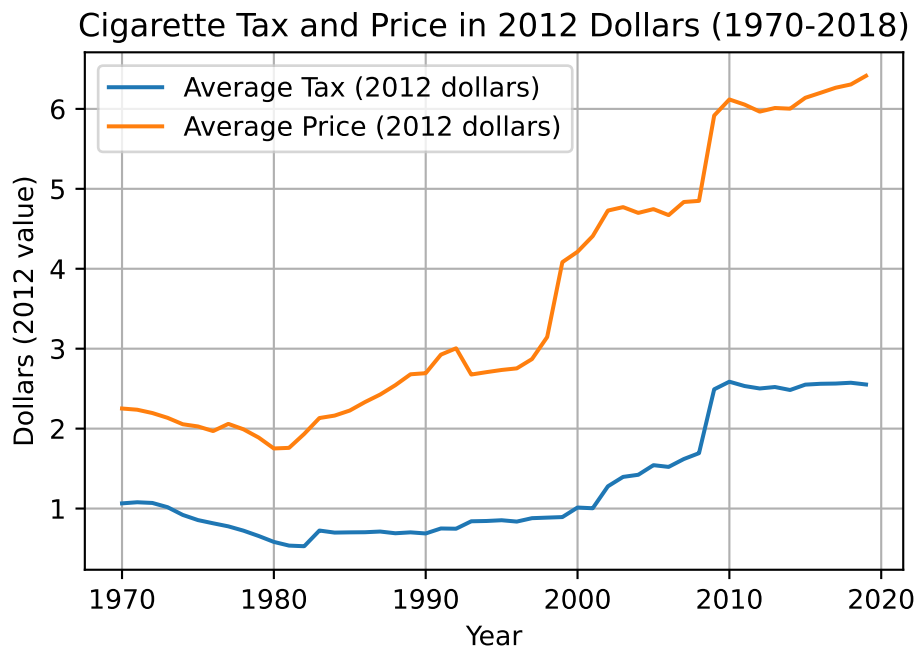
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1 Bar Graph

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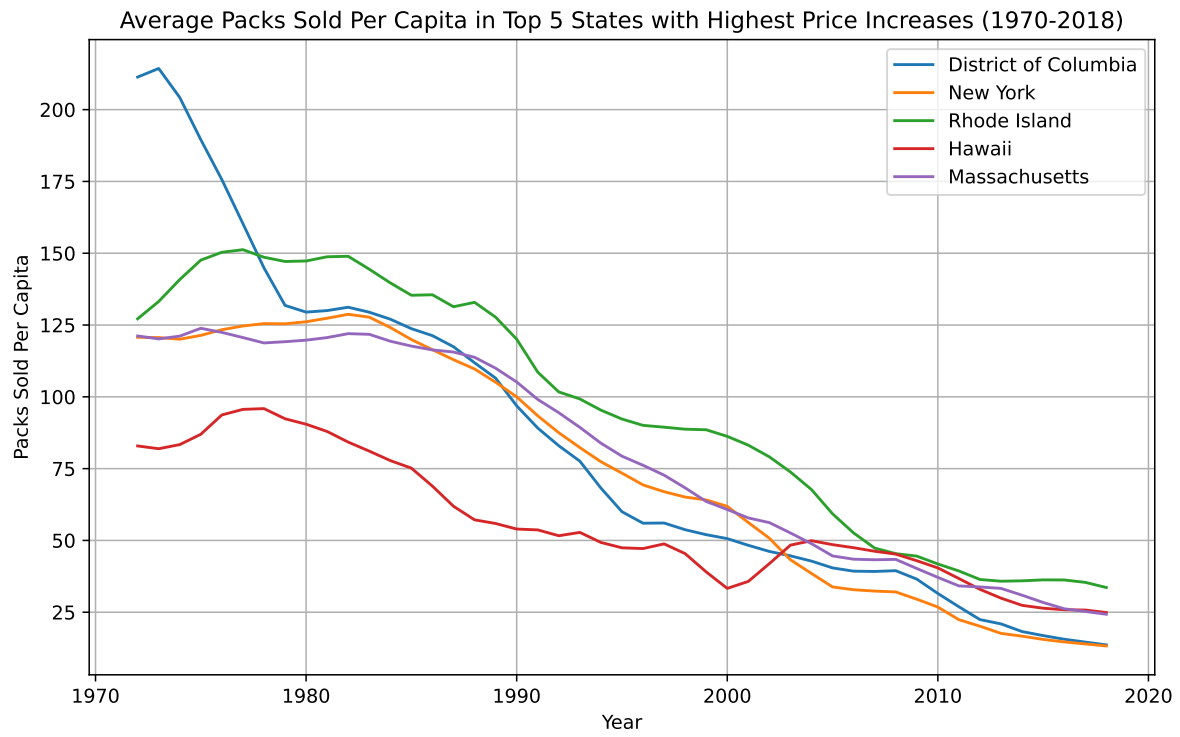
Proportion of States with Cigarette Tax Change (1970-1985)

Cigarette Tax and Price in 2012 Dollars (1970-2018)

5 highest states in legend

Average Packs Sold Per Capita in Top 5 States with Highest Price Increases (1970-2018)

5 lowest states in legend

Average Packs Sold Per Capita in Top 5 States with Smallest Price Increases (1970-2018)

5

Average Packs Sold Per Capita in Top 5 States with Biggest & Smallest Price Increases (1970-2018)
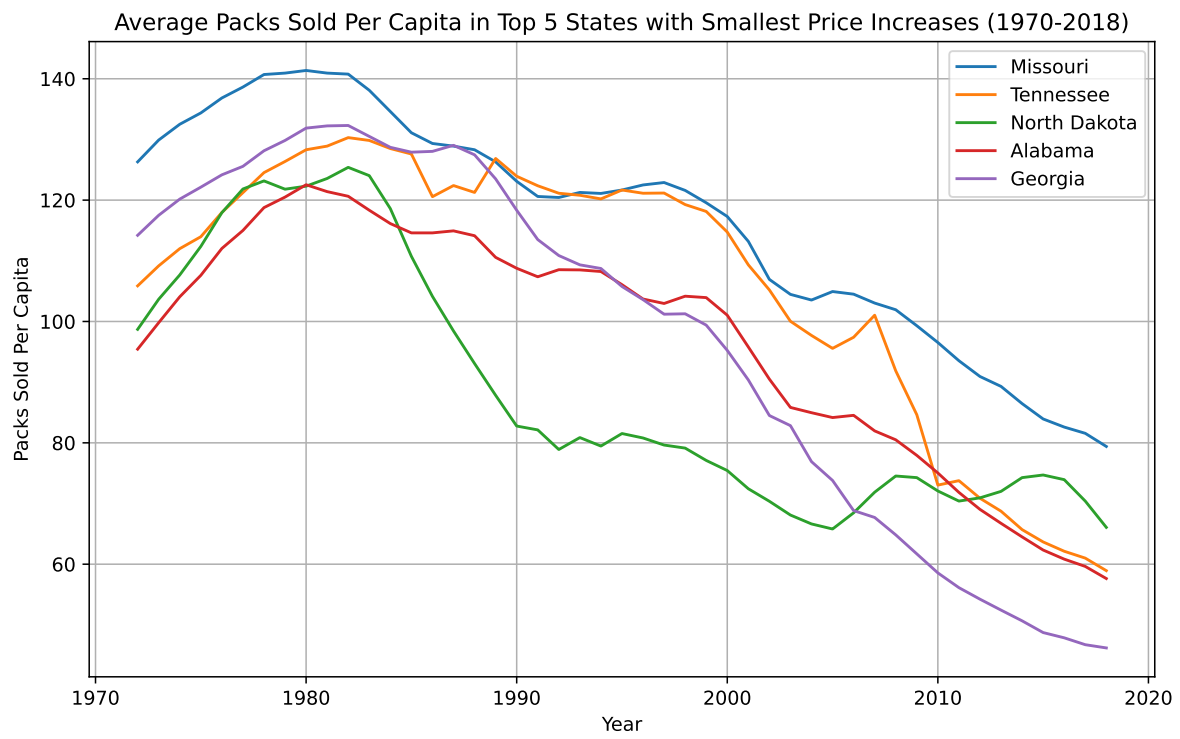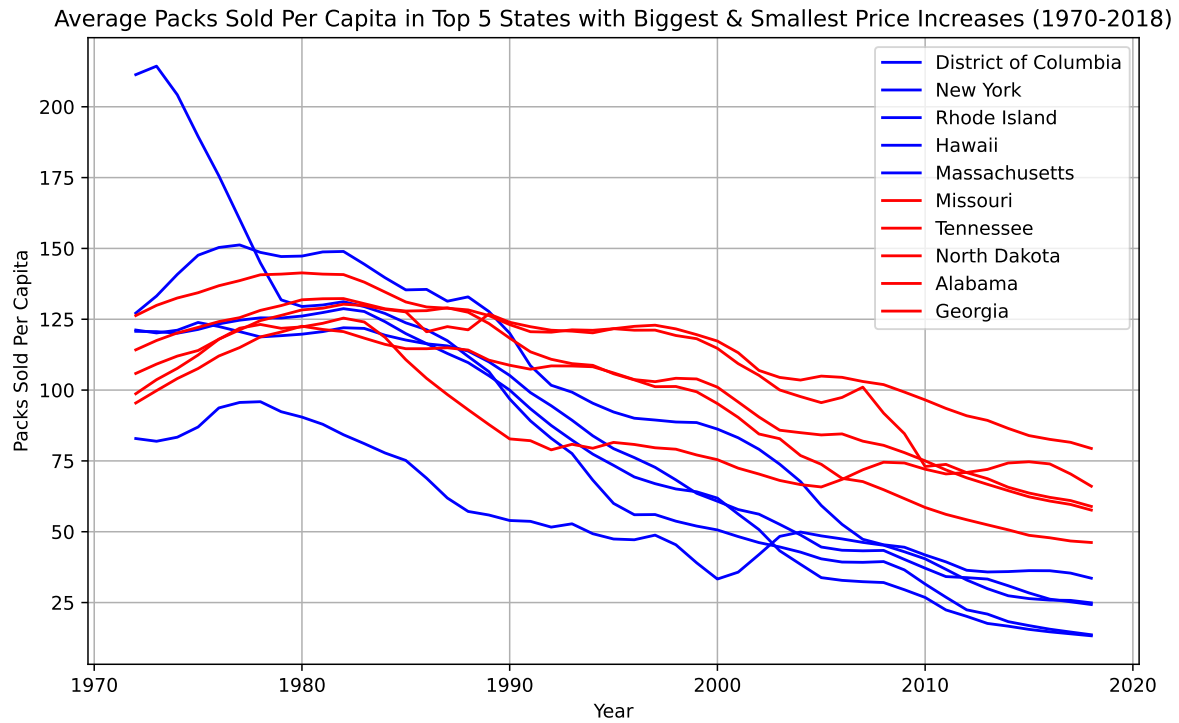
Both start with similar sales per capita, but the states with the highest price increases have a steeper decline in sales per capita compared to the states with the smallest price increases. You can see this as they all end with a lower number of packs sold per capita than all the red(low price increase) 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

the value of OLS without the instrument is -0.809 and with the instrument is -0.923. This means that a 1% increase in price will decrease sales per capita by 0.81% or 0.92%. They are different and this is due the the endogeneity in the naive estimate. For example a state could increase the tax rate because it has a high smoking rate, and this would bias the estimate.

The trend of the increase in effect shown by the IV estimate is consistent in both time periods. This is due to the same issues of endogeneity in both time periods. Comparing the two time periods, the effect of the price increase on sales per capita is larger in the second time period. This could be due to the fact that the taxes increased more steaply in the second 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.