

Submission1-HW3

Research Methods, Spring 2024

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<https://github.com/carolinezhansen/tobacco/tree/main>

Answers for Homework 3: Submission 1

Problem 1

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

	[,1]
[1,]	0.7
[2,]	1.9
[3,]	3.1
[4,]	4.3
[5,]	5.5
[6,]	6.7
[7,]	7.9
[8,]	9.1
[9,]	10.3
[10,]	11.5
[11,]	12.7
[12,]	13.9
[13,]	15.1
[14,]	16.3
[15,]	17.5
[16,]	18.7

Problem 2

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.

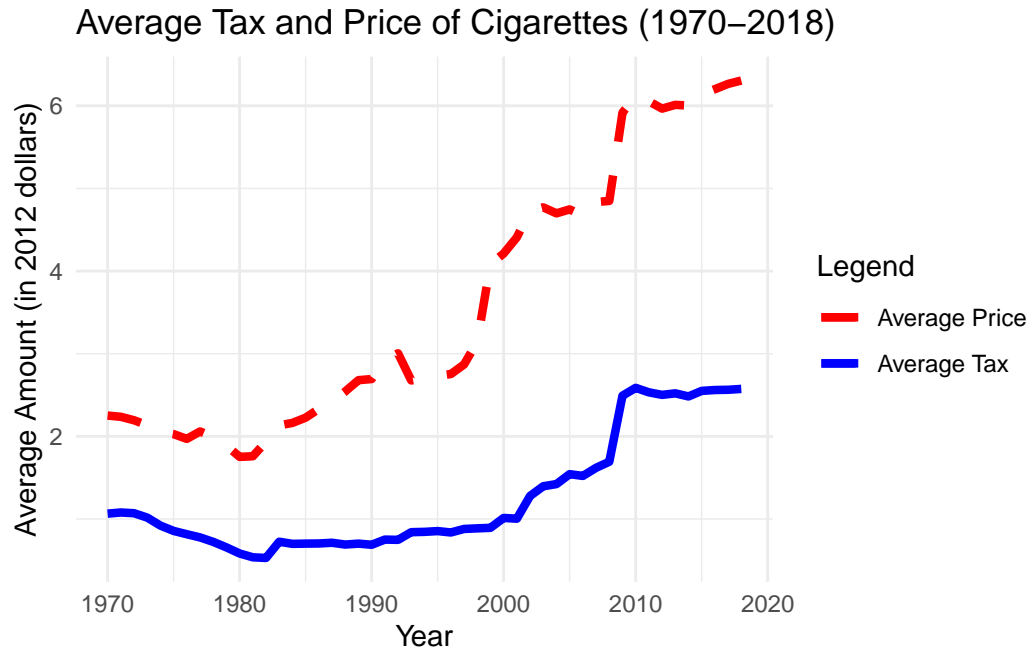


Figure 1: Average Tax and Average Price of Cigarettes from 1970 to 2018

Problem 3

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.

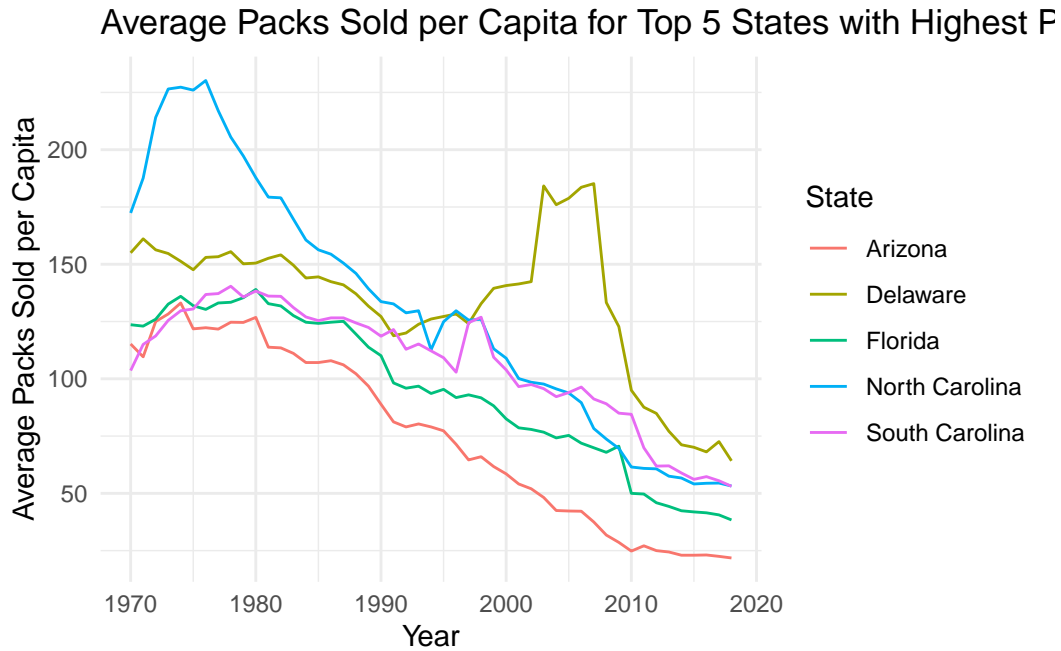


Figure 2: Average Packs Sold per Capita for Top 5 States with Highest Price Increases

Problem 4

4. 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.

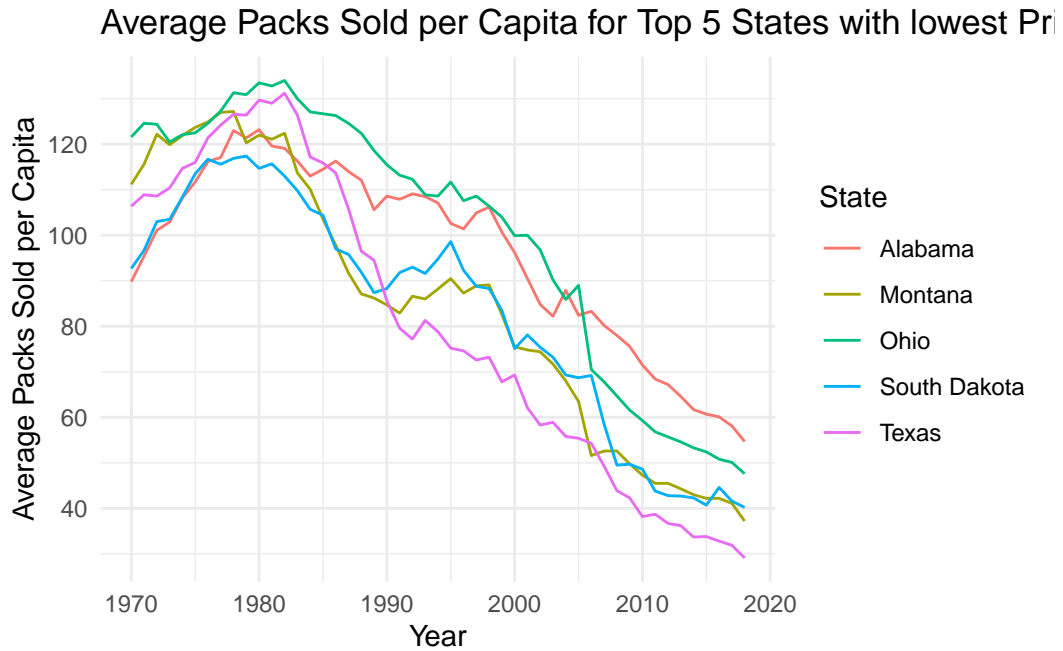


Figure 3: Average Packs Sold per Capita for Bottom 5 States with Lowest Price Increases

Problem 5

5. 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.

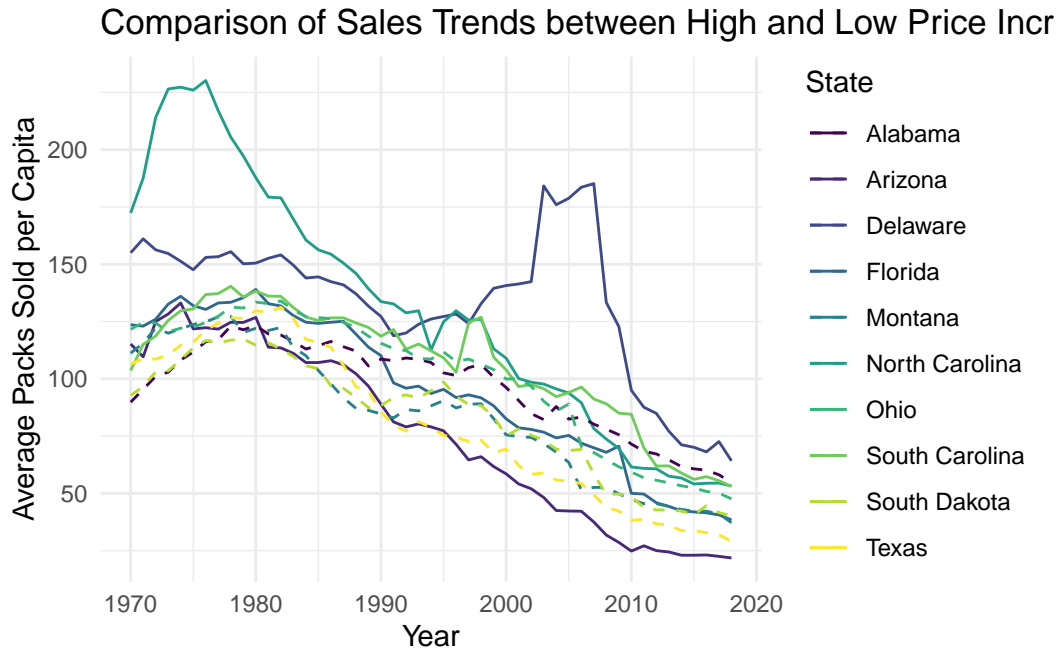


Figure 4: Comparison of Sales Trends between High and Low Price Increase States

Problem 6

6.# Focusing only on the time period from 1970 to 1990, regress log sales on log prices to estimate the price elasticity of demand over that period. Interpret your results.

	Label	Coefficient	Standard.Error
1	Intercept	4.7504020	0.008115896
2	Log Price	-0.1715396	0.013829473

Problem 7

7.# Again limiting to 1970 to 1990, regress log sales on log prices using the total (federal and state) cigarette tax (in dollars) as an instrument for log prices. Interpret your results and compare your estimates to those without an instrument. Are they different? If so, why?

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OLS	Coefficients	Standard Error
Intercept	4.9911084	0.0341057
Log Price	0.5023735	0.0898367

IV of Log Sales on Log Prices: 1970-1990

Problem 8

8.# Show the first stage and reduced-form results from the instrument.

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First Stage	Coefficients	Standard Error
Intercept	-0.5035890	0.0207358
Log Price	-0.4118129	0.0438123

First Stage 1970-1990

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Reduced Form	Coefficients	Standard Error
Intercept	-0.5035890	0.0207358
Log Price	-0.4118129	0.0438123

Reduced Form 1970-1990

Problem 9

9.# Again limiting to 1970 to 1990, regress log sales on log prices using the total (federal and state) cigarette tax (in dollars) as an instrument for log prices. Interpret your results and compare your estimates to those without an instrument. Are they different? If so, why?

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OLS	Coefficients	Standard Error
Intercept	5.0243100	0.0230583
Log Price	-0.6500757	0.0179467

Regression of Log Sales on Log Prices: 1990-2015

IV	Coefficients	Standard Error
Intercept	5.2081165	0.0269037
Log Price	-0.8043929	0.0213148

IV of Log Sales on Log Prices: 1990-2015

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First Stage	Coefficients	Standard Error
Intercept	1.0797430	0.0071046
Log Price	0.7181911	0.0118036

First Stage 1990-2015

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Reduced Form	Coefficients	Standard Error
Intercept	1.0797430	0.0071046
Log Price	0.7181911	0.0118036

Reduced Form 1990-2015