bae-j-hwk-3-2

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2023-03-15

Summarize the Data

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

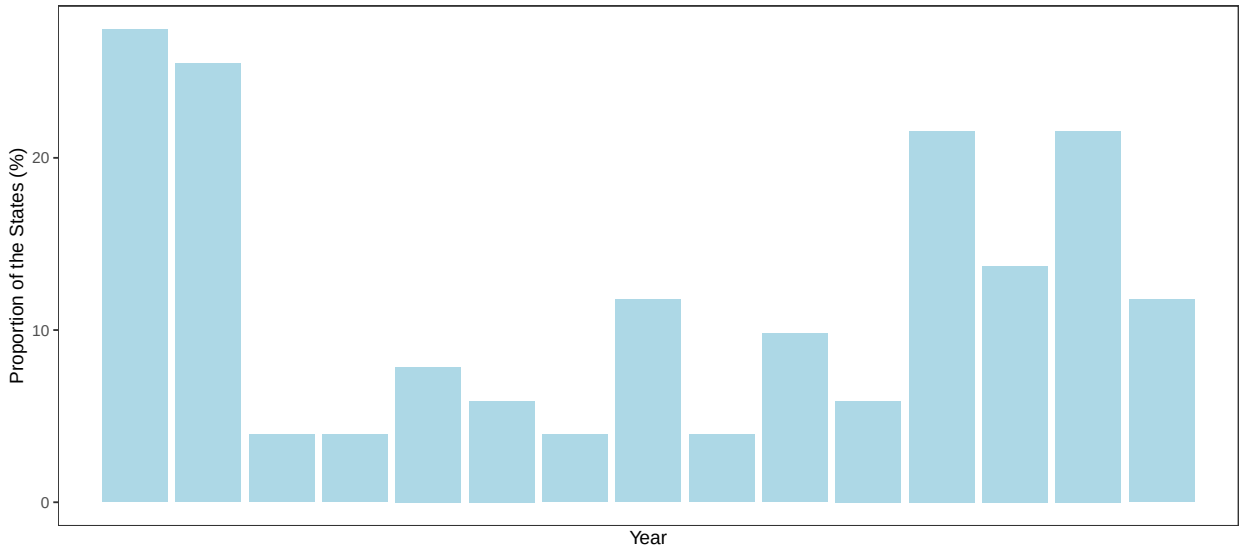

Figure 1: Proportion of states with a change in their cigarette tax

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.

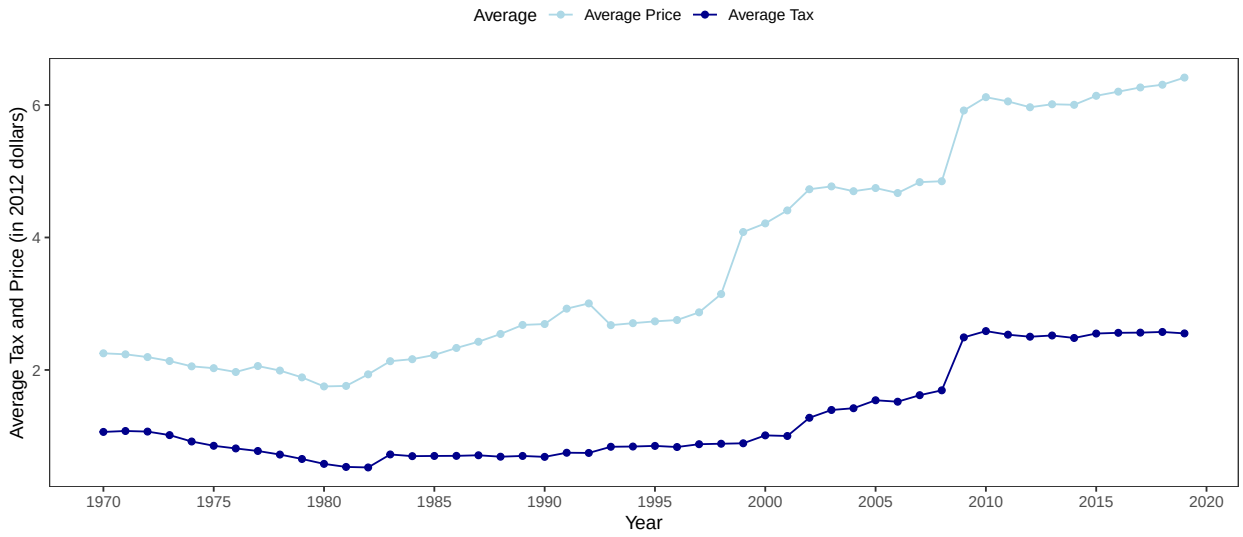

Figure 2: Average Tax (in 2012 dollars) on Cigarettes and the Average Price of a Pack of Cigarettes from 1970 to 2018

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.

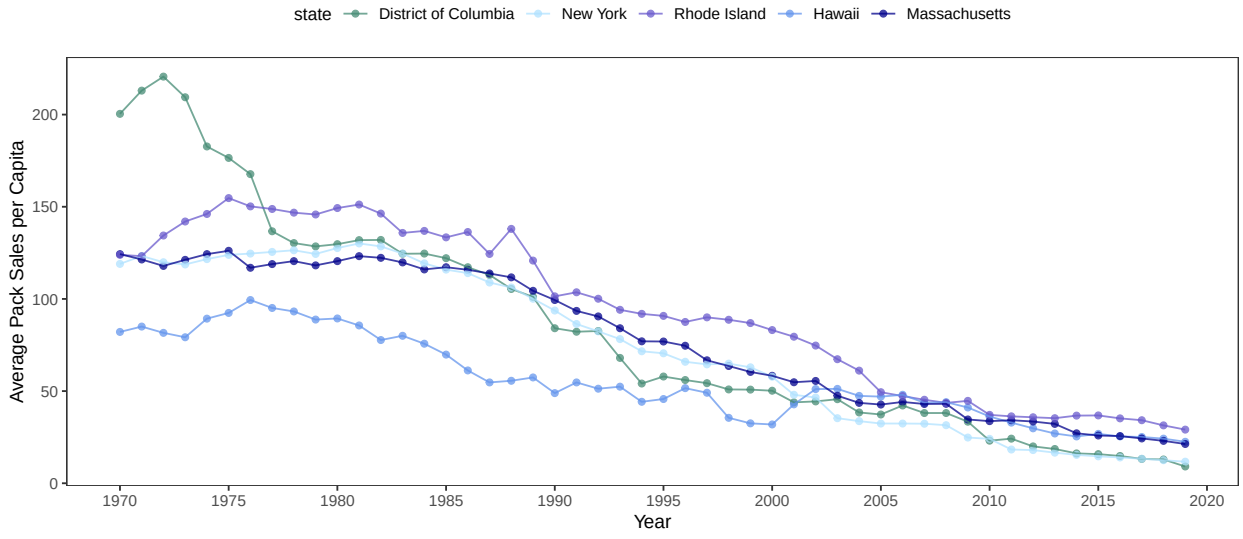

Figure 3: The Average Number of Packs sold per Capita for the 5 States with the Highest Increases in Cigarette Prices

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.

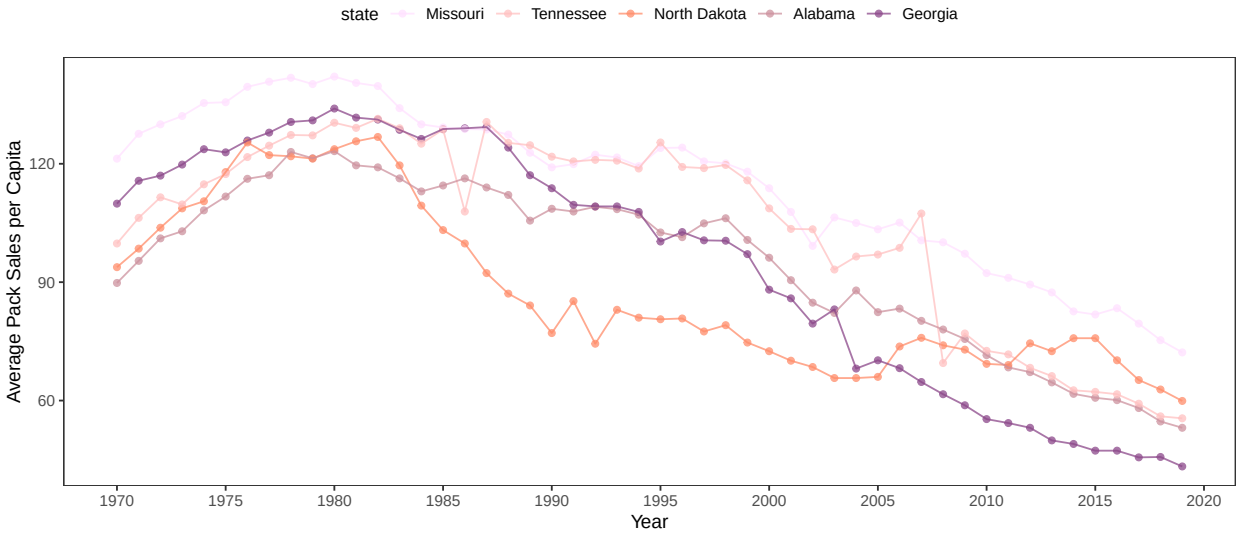

Figure 4: The Average Number of Packs sold per Capita for the 5 States with the Lowest Increases in Cigarette Prices

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

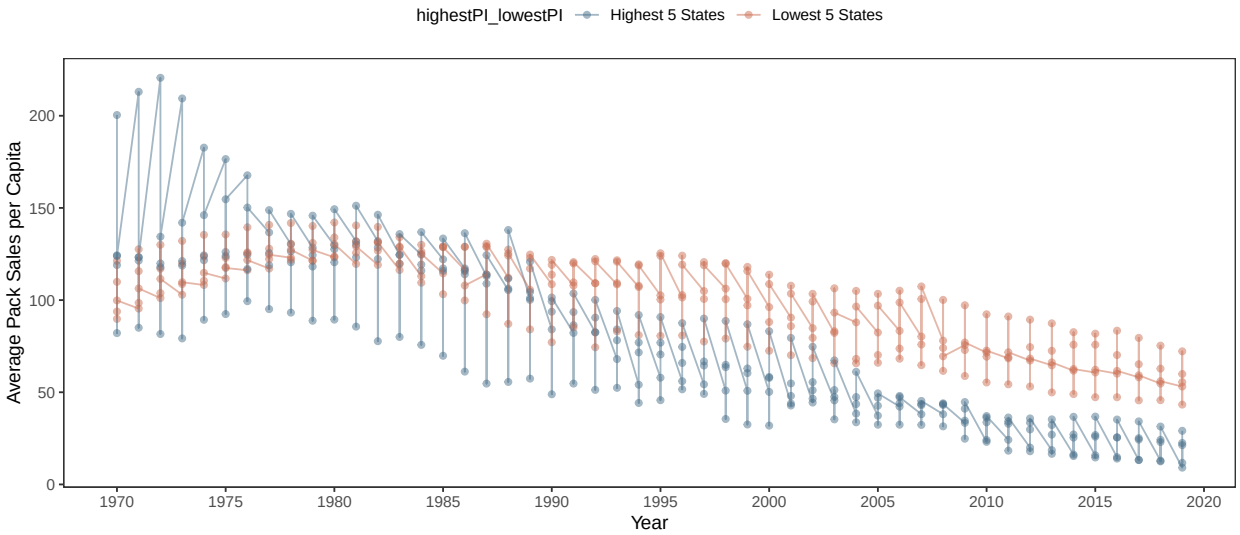

Figure 5: The Average Number of Packs sold per Capita for the 5 States with the Highest and Lowest Increases in Cigarette Prices

Estimate ATEs

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.

Table 1: Log-Log Regression of Sales and Prices (1970-1990)

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	5.42738	0.02975	182.42377	0
ln_price	-0.80944	0.03837	-21.09805	0

Table 2: Log-Log Regression of Sales and Prices

	Estimate
Intercept	5.427***
	(0.030)
ln_price	−0.809***
	(0.038)
Num.Obs.	1071
R2	0.294
R2 Adj.	0.293
AIC	−520.8
BIC	−505.9
Log.Lik.	263.398
F	445.128
RMSE	0.19

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

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?

Table 3: Log-Log Regression of Sales and Prices Using Total Cigarette Tax as an Instrument for Log Prices (1970-1990)

	Estimate
Intercept	5.372***
	(0.057)
fit_ln_price	−0.736***
	(0.075)
Num.Obs.	1071
R2	0.292
R2 Adj.	0.291
AIC	−519.1
BIC	−509.2
RMSE	0.19
Std.Errors	IID

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

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

still working on it, progress on R code

9-1. Focusing only on the time period from 1991-2015, regress log sales on log prices to estimate the price elasticity of demand over that period.

still working on it, progress on R code

9-2. Limiting to 1991-2015, regress log sales on log prices using the total (federal and state) cigarette tax (in dollars) as an instrument for log prices.

still working on it, progress on R code

9-3 Show the first stage and reduced-form results from the instrument.

still working on it, progress on R code

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

still working on it, progress on R code