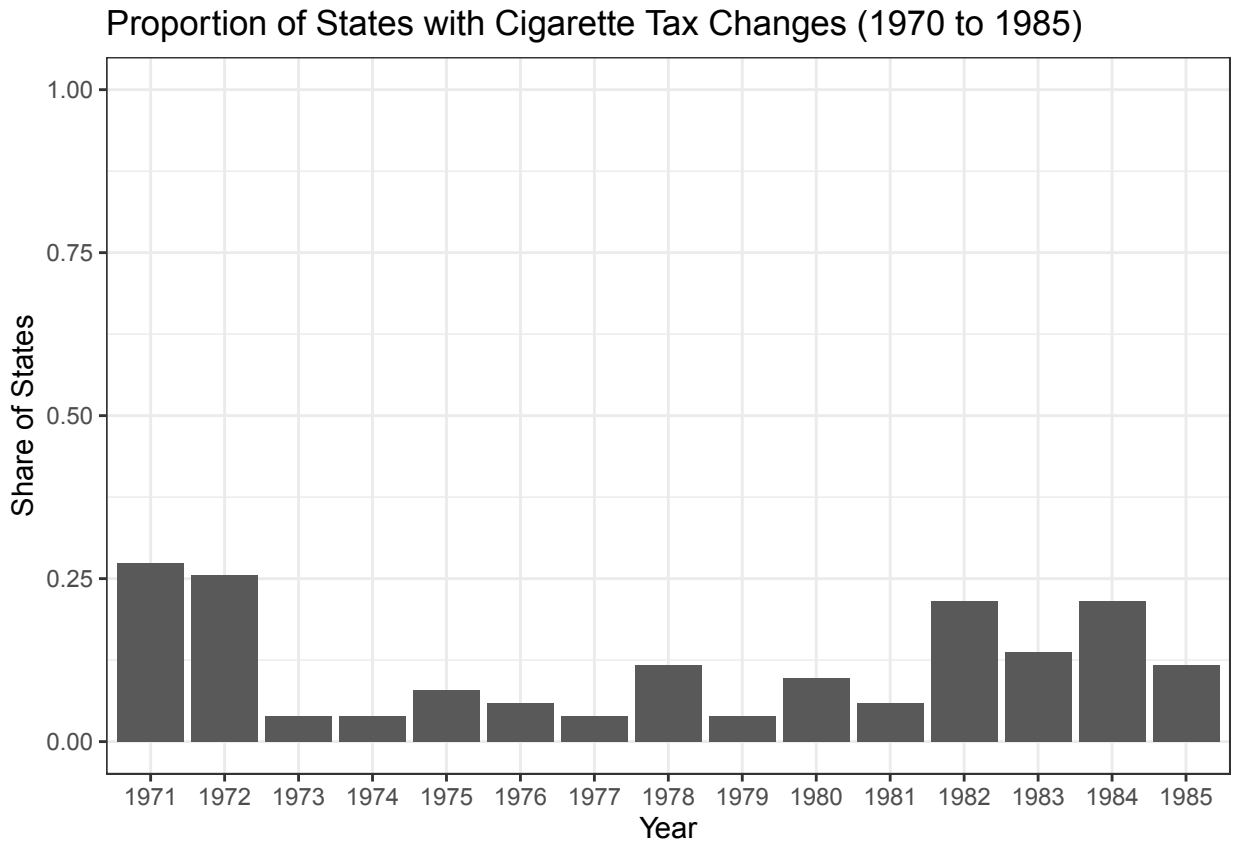
Homework 3

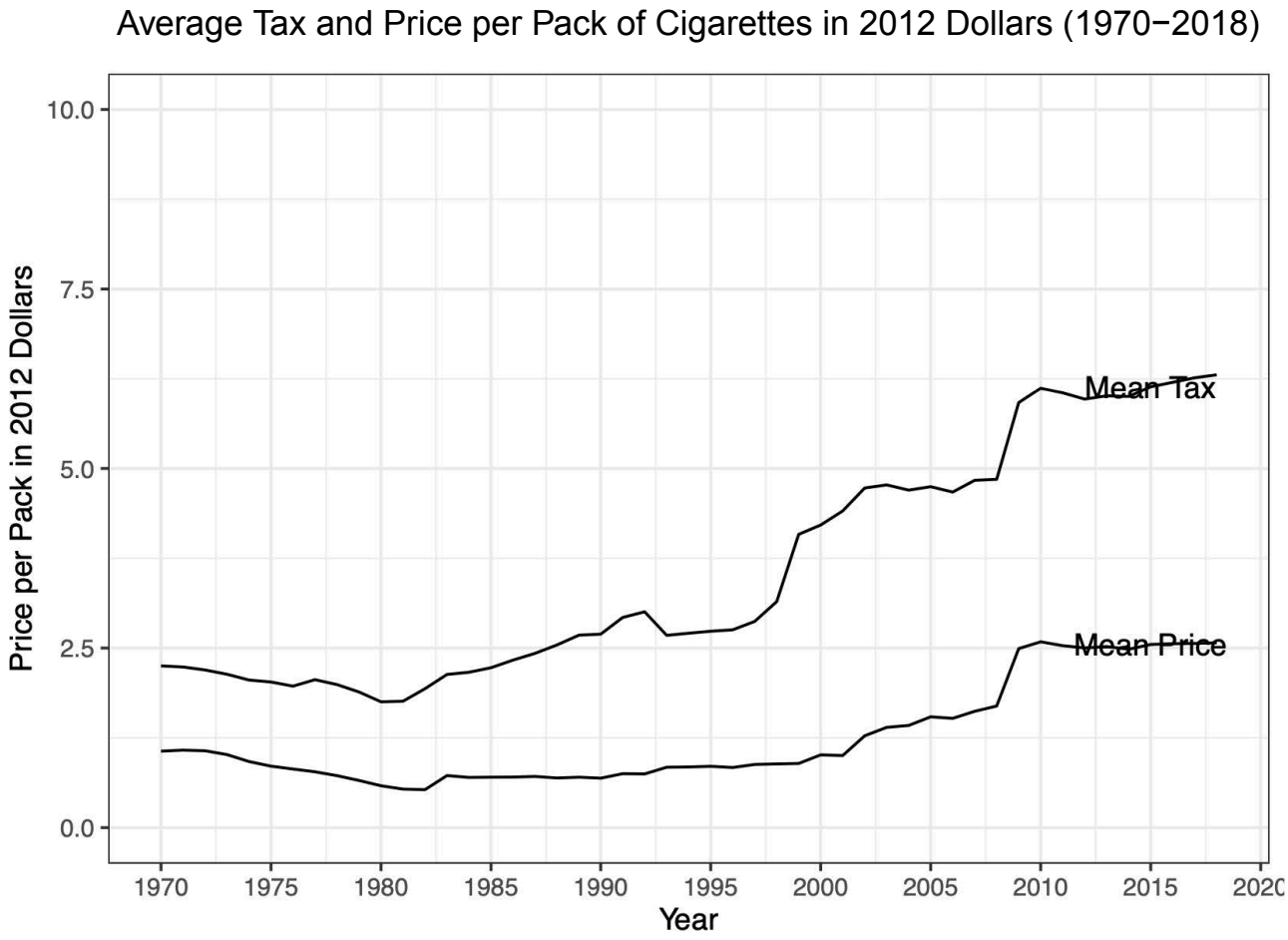
Virginia Sanson

19 March 2023

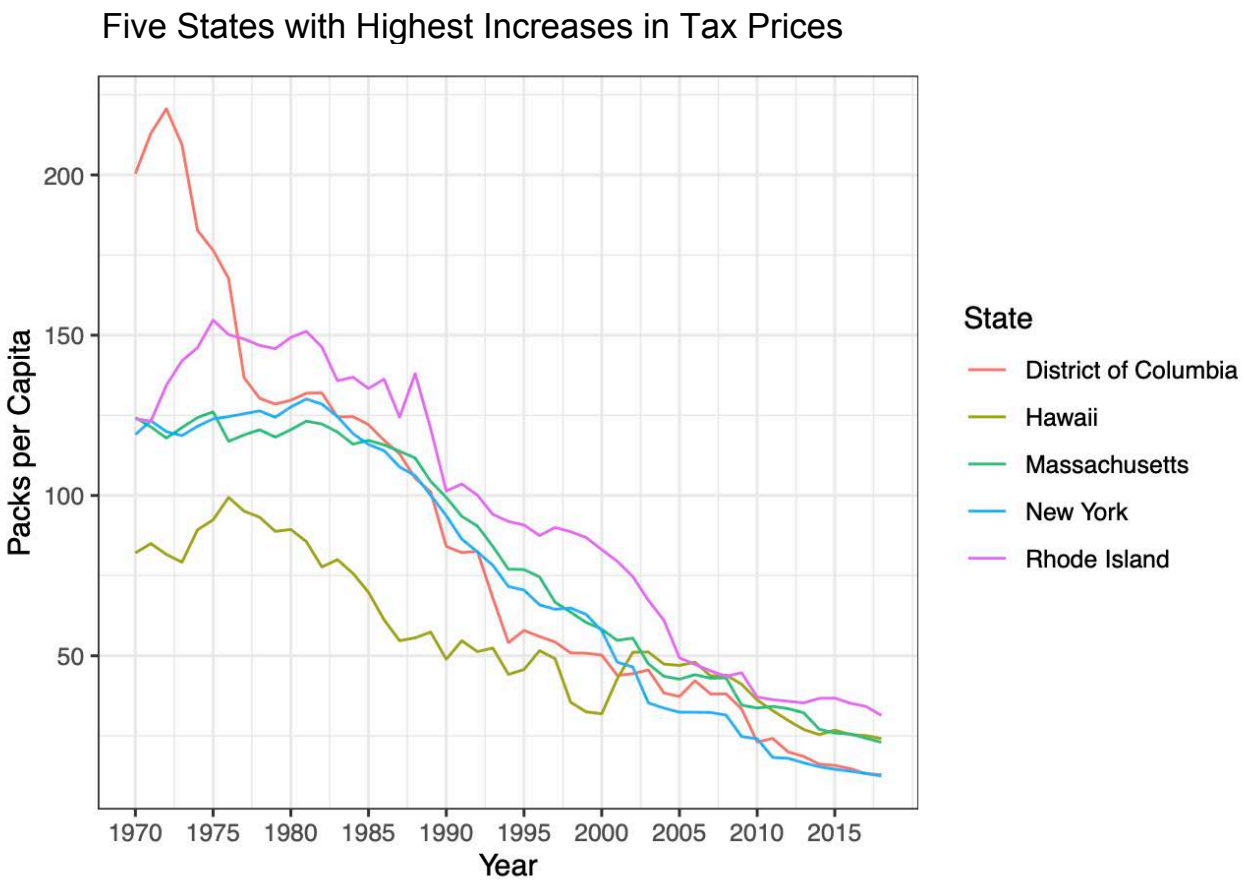
Part 1 Question 1



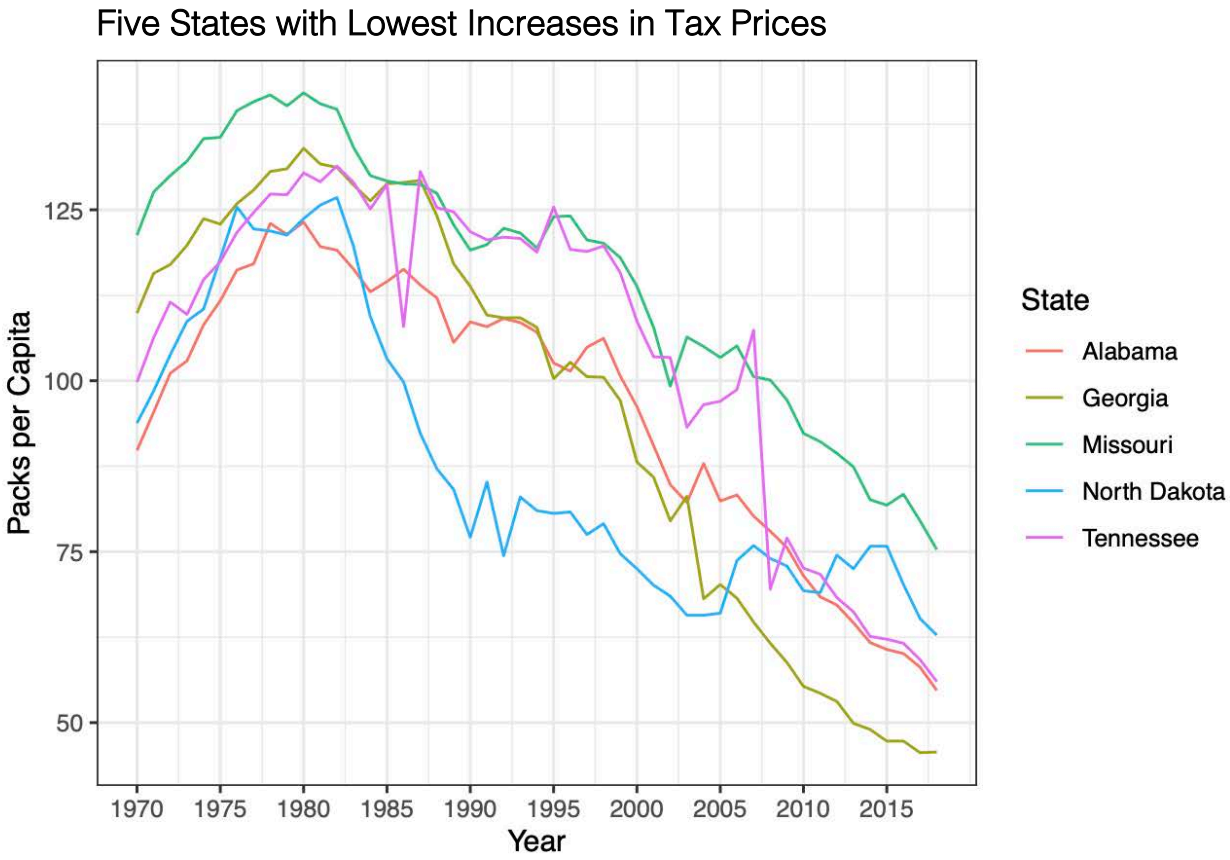
Question 2


Average Tax and Price per Pack of Cigarettes in 2012 Dollars (1970−2018)
Price per Pack in 2012 Dollars
10.0
7.5
5.0
2.5
0.0
Mean Tax
Mean Price
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
Year

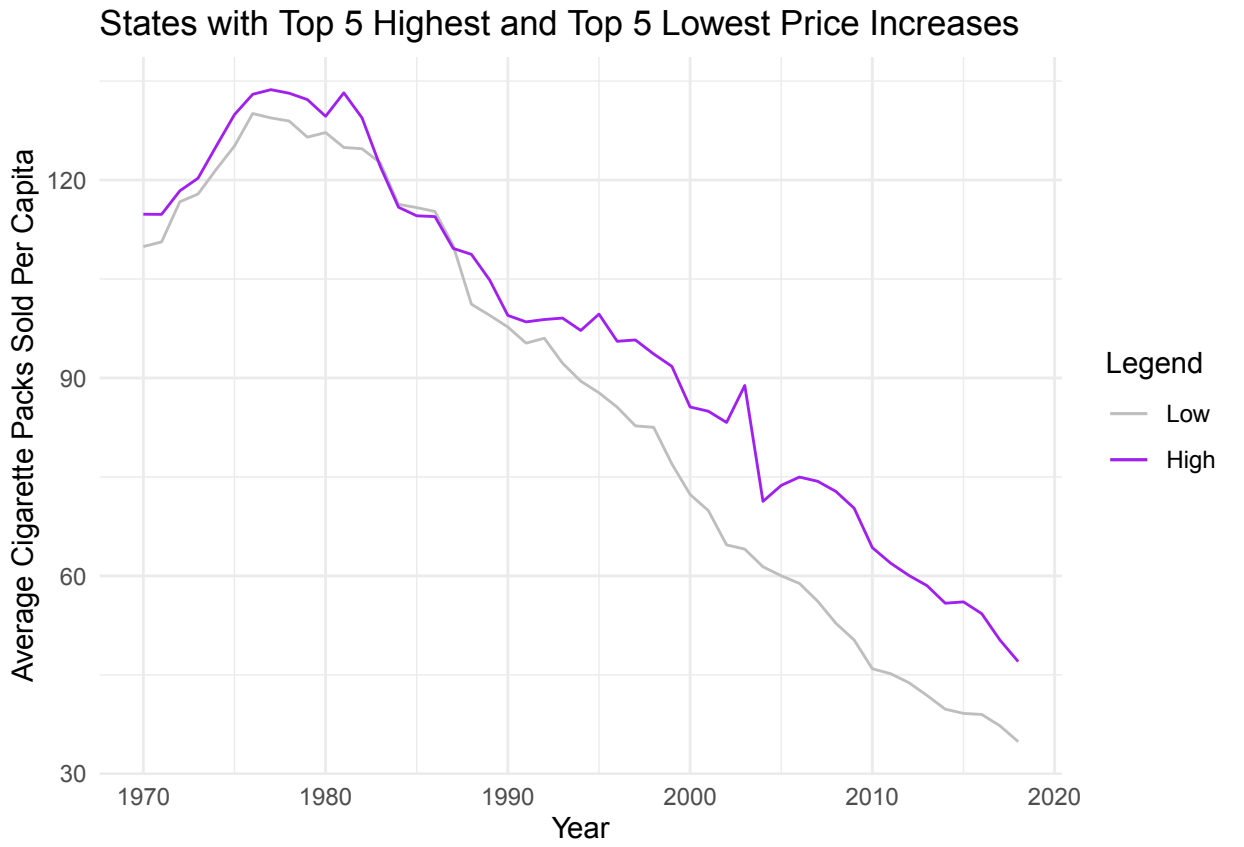
Question 3


Five States with Highest Increases in Tax Prices
Packs per Capita
200
150
100
50
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Year
State
District of Columbia
Hawaii
Massachusetts
New York
Rhode Island

Question 4


Five States with Lowest Increases in Tax Prices
Packs per Capita
125
100
75
50
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Year
State
Alabama
Georgia
Missouri
North Dakota
Tennessee

Question 5



Both groups of states had deep and gradual declines in their average sales per capita trends. They began with overall increasing sales until ~1976, and the states with the lowest price increases resulted to be the ones with the lower cigarette packs sold per capita, on average.

Part 2
Question 1

Table 1: Price Elasticity of Demand (1970-1990)

	OLS
Log Price	−0.809
	(0.038)
Num.Obs.	1071
R2	0.294

A 1% increase in cost per cigarette pack is estimated to decrease the sales per capita by 0.80% (on average).

Question 2

Table 2: Price Elasticity of Demand using IVs (1970-1990)

	IV
Log Price	−0.736
	(0.075)
Num.Obs.	1071
R2	0.292

A 1% increase in cost per cigarette pack is estimated to decrease the sales per capita by 0.74% (on average). The instrumental variables changed the estimates in that a change in cost has a greater effect on sales than before, as we are now including total federal and state tax on the cost of cigarettes. Cigarettes seem more of an elastic good.

Question 3

Table 3: Point Estimates (1970-1990)

	First Stage	Reduced Form
Cigarette Tax	0.327	−0.241
	(0.017)	(0.028)
Num.Obs.	1071	1071
R2	0.262	0.064

Question 4

Table 4: Price Elasticity Estimates (1991-2015)

	OLS	IV
Log Price	−0.997	−1.164
	(0.025)	(0.029)
Num.Obs.	1275	1275
R2	0.561	0.546

A 1% increase in cost per cigarette pack is estimated to decrease the sales per capita by 0.997% (on average).

A 1% increase in cost per cigarette pack is estimated to decrease the sales per capita by 1.16% (on average). The change in cost has an even greater effect on sales when estimating with instrument variables, which suggests cigarettes are an extremely elastic good. This can be explained by the effect of cigarette taxes on price, and increasing evidence by the CDC on the ill health effects smoking has, which makes people more sensitive to increased taxes/price.

Table 5: Point Estimates (1991-2015)

	First Stage	Reduced Form
Cigarette Tax	0.308	−0.358
	(0.005)	(0.008)
Num.Obs.	1275	1275
R2	0.764	0.585

Question 5

The elasticity estimations were higher in 1991-2015 versus 1970-1990. Taxes on cigarette packs increased, and coupled with information about the detrimental health effects about smoking cigarettes beginning in 1990, led to increased sensitivity from people about purchasing cigarettes.