Assignment: Competition and Monopoly

Industrial Organization

1. *Gasoline.* Please use whatever package you like (e.g., Stata) to clean the data, but please do all analysis using MATLAB (or R or python if you prefer).

   This question is based on the code and data posted for replication here for a study of gasoline consumption by Li, Linn, and Muehlegger (2014). If you are not already familiar with the paper, don't become familiar (at least not until after you've submitted your work). It's better to approach this question with a fresh perspective.
   We will work with the file `annual_regression_data.dta`, which contains data on the price and quantity of gasoline consumed by state and year for the contiguous 48 states of the United States, along with various other pieces of information. You may ignore the other files in the archive.
   Assume that each state in the United States is a distinct gasoline market, that the market for gasoline is perfectly competitive, and that the production and consumption of gasoline are static decisions. Assume further that the elasticity of demand and the elasticity of supply of gasoline are constant over time and across states. Assume that when a consumer buys a gallon of gasoline, the consumer pays the tax-inclusive price, and the supplier receives the price net of taxes.
   You will likely need to make other assumptions as well. When you do, please state them explicitly.

   (a) Estimate the elasticity of supply of gasoline. Provide a confidence interval. Can you reject the hypothesis that the supply of gasoline is elastic?

   (b) Estimate the elasticity of demand for gasoline. Provide a confidence interval. Can you reject the hypothesis that demand for gasoline is elastic?

   (c) A supply shock is a change from one year to the next in the amount of gasoline that would be supplied at a given price. According to your analysis, in what years did the US experience the most negative shock to the supply of gasoline? Why?

   (d) In what year after 2000 did the US experience the most negative shock to the supply of gasoline? Why?

   (e) A demand shock is a change from one year to the next in the amount of gasoline that would be demanded at a given price. Examine the shocks to US gasoline demand over time as implied by your analysis. Is there any pattern that you can discern that explains when the shocks tend to be negative?

(f) Suppose that Rhode Island had declared a gasoline tax holiday in 2008, rebating the full value of all state and federal gasoline taxes. According to your analysis, what would have been the price of gasoline in that year? The quantity of gasoline?

(g) What would have been the gain in consumer surplus, producer surplus, and total surplus from the tax holiday?

(h) Suppose that Rhode Island had decided in 2008 to grant a monopoly concession to a single gasoline supplier (in addition to having a tax holiday). What would have been the price and quantity of gasoline in Rhode Island 2008?

(i) Plot the unemployment rate in Rhode Island over time. Do you notice anything odd about this series?

2. *Newspapers.* Perform calculations for this question using Excel or Google Sheets. Be sure to state your assumptions.

   The question uses data from the file `newspaper.pdf`. The file contains the 1956 income statement of an anonymous US daily newspaper with a daily circulation of 50,000. You may assume throughout that the newspaper is a monopolist that maximizes static profits.

   (a) A regulator forces the newspaper to lower its price by 1%. How many daily readers will the newspaper gain?

   (b) How much (in dollars) will the newspaper gain or lose in profits as a result of the regulation?

   (c) How much (in dollars) will the regulation increase or decrease the total surplus created by the market for this newspaper?

   (d) How much profit (in dollars) would the newspaper lose if the government were instead to impose a 1% tax on its profit? What is the impact on total surplus?

   (e) How much profit would the newspaper lose if 1% of the local population were to emigrate (and demand were to decrease proportionally)? Is this better or worse for the newspaper than the profit tax?