

Use Numbers: Assignment 1 of 3
Equilibrium Prices, Supply and Demand

Due before Lecture 3 on September 12, 2023

Bring a digital or hard copy of the assignment to class; we will discuss it in class the day you turn it in.

We have learned that the price we observe in the market is the equilibrium price. This equilibrium price is influenced by both supply and demand.

In this assignment, you analyze one specific equilibrium price over time. You choose two big changes in price and evaluate, using news sources, whether those changes are due to supply or demand.

We focus on oil prices, and you can find the data files with monthly oil prices here: [\[csv\]](#), [\[xls\]](#), [\[rds\]](#). If you prefer annual data, you can find these at [\[csv\]](#), [\[xls\]](#), [\[rds\]](#). These are all the same data, just in different formats.

These oil price data come from [FRED](#), the St. Louis Federal Reserve Bank's data warehouse. Specifically, we are looking at the spot price of one barrel of West Texas Intermediate crude oil, which is the type of oil produced in Texas.¹

Google and news archives should be sufficient to answer these questions. This is not a major research paper, so please scale your effort accordingly. When needed, cite sources so a researcher could find them. I do not care about specific citation format.

While your analysis should rely on outside sources, any phrase of more than two words from another source should have quotes around it and a citation (any format is fine). If we detect plagiarism (see [here](#) if you are uncertain what this means) you will get a zero on this assignment and may face additional consequences depending on the severity of your actions.

You are welcome to discuss parts of this assignment with other students, or to query ChatGPT (recalling that ChatGPT sometimes makes up sources). However, any work you turn in must be your own and written in your own words.

To make graphs, you can use Excel, R (entirely not required, or even suggested) or the software of your choice. We can support technical questions in Excel, R or Stata.

¹While the FRED data are nominal (not adjusted for inflation), the dataset you have is already in real dollars. "Real dollars" means dollars corrected for inflation. Intuitively, this means that a dollar purchases the same amount over time. If you are curious, we use [this](#) series to deflate the prices.

1 Questions

1. Graph the price of WTI over time, for all years in the data.
2. Find the average oil price in each decade and make a table that reports this. Use years 1946-1949 as the first decade, 1950-1959 as the second decade, etc.
3. Consider the average price by decade from your table from Question 2. In looking at the pattern of price change by decade over time, choose a decade that stands out from the overall pattern (do not include the current decade, which is still too short to consider!). Write which decade you have chosen, and write a brief paragraph giving at least one reason that this particular decade sticks out from the rest. Explain whether this reason is supply or demand.
4. Pick out two large price changes from the graph you made for question 1. By “large price change,” I mean a period where the line is steeply sloped, which is when the price rises or falls quickly. (The data are monthly, but these changes need not be monthly.) What drove these changes? Identify whether they are driven primarily by supply or demand. If you can’t differentiate between supply and demand in the price change, choose another price change. Write one short paragraph for each price change explaining
 - (a) the date of the price change
 - (b) what caused the change
 - (c) whether this was a change in demand or supply
5. Find another price series over time. That is, find data that report the price over time on a product or commodity of your choosing that is not oil or gasoline. Any frequency – daily, weekly, annual – is fine. There are many great places to find price data online: the Bureau of Labor Statistics, the Bureau of Economic Analysis, and many zillions of other private sources.

Identify two changes to the prices you found and explain whether they are supply or demand driven. You should be able to answer this in under one page. Your answer should include the following

- (a) What the price series is
- (b) Where you got it from
- (c) A graph of the price over time
- (d) A description (as in 3) of when the change occurred and whether it was supply or demand driven

2 How to turn it in

Turn this assignment in to your GW Box folder.

Name the assignment “use_numbers_1of3_lastname”. So mine would be “use_numbers_1of3_brooks”.

3 Data

The dataset for the assignment has the following columns (variables if you are using statistical software). The annual file has no month or month-year variables.

Variable	Definition and Source
wti_real	Real (inflation-adjusted) price of one barrel of West Texas Intermediate crude oil
year	Year of this price
month	Month of this price
month_year	Month and year of this price; sometimes it is helpful to have both in one variable