Homework 3 (42 Points)

Problem 1 (8 Points)

Consider the market for coffee in the area surrounding XMU. For each of the events listed here, draw a diagram to show how supply and/or demand changes and its effect on equilibrium price and quantity[1].

1. The government imposes a new tariff on imported coffee beans
2. College students return to campus
3. There is an unexpected increase in tea leaf production
4. Improvements in the XM job market have raised per capita income

Problem 2 (2 Points)

Suppose that in the year 2015 the number of births is temporarily high. How does this baby boom affect the price of babysitting services in 2020 and 2030? (Hint: 5-year-olds need babysitters, whereas 15-year-olds can be babysitters.)

Problem 3 (4 Points)

Read the article "The Rich vs Poor Debate: Are Kids Normal or Inferior Goods?" Summarize the author's arguments. Do you agree with his analysis? Why or why not?

[1] When you draw diagrams, make sure you properly label all lines and axes.

Problem 4 (4 Points)

Market research reveals the following information about the market for chocolate bars: The demand schedule can be represented by the equation $Q_D = 9000 - 300P$, where Q_D is the quantity demanded and P is the price. The supply schedule can be represented by the equation $Q_S = 1000 + 700P$, where Q_S is the quantity supplied.

1. Graph the demand and supply curves and calculate the equilibrium price and quantity. (2 Points)

2. If the government establishes a price floor of $20 per chocolate bar, how many chocolate bars will be sold? What do you expect might happen as a result? (2 Points)

Problem 5 (8 Points)

Read the articles "Flexible figures" and "Dynamic Pricing - Uber, Coca Cola, Disneyland and Elsewhere".

1. What is dynamic pricing? How to understand the practice of dynamic pricing using the supply and demand model?

2. Can you think of any business today that can benefit from adopting dynamic pricing?

3. What are some of the limitations of dynamic pricing? Explain why consumers can be unhappy with some of its applications.

Problem 6 (4 Points)

Figure 1 shows crude oil prices from 2002 to 2017. Read the following articles and use supply and demand analysis to explain the oil price movements over this period of time. In particular, what explains the rise in oil price from 2002 to July of 2008? What explains its collapse from July of 2008 to Feburary of 2009 and its subsequent rebound? What explains the fall in oil price from July 2014 to Feburary 2016?

- Hamilton, J., "What's up with oil prices?" Econbrowser, 2005/06/04.
- Hamilton, J., "The China Syndrome," Econbrowser, 2010/06/29.
- Hamilton, J., "Trends in oil supply and demand," Econbrowser, 2016/05/29.
- Russell, K., "How Oil Prices Are Falling Again," New York Times, 2016/07/29

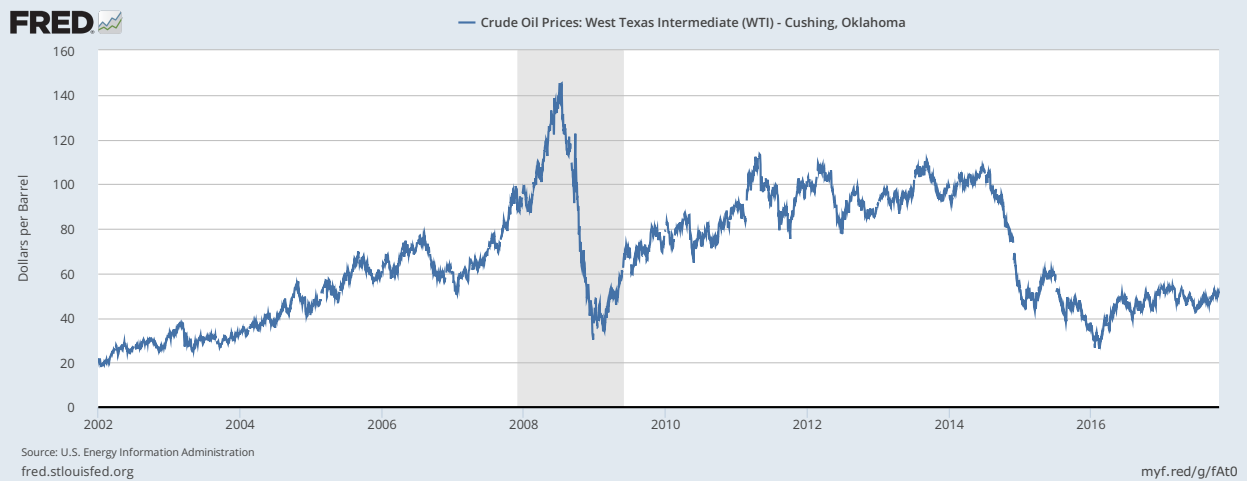

Figure 1: Crude Oil Price

Problem 7 (4 Points)

When poor families have to increase their consumption of staple foods such as rice or wheat when the price of the staple food increases, they are said to exhibit **Giffen behavior**. Individuals with Giffen behavior have *upward-sloping* demand curves, i.e. the higher the price of the staple food, the more they buy. In the article "The Indiana Jones of Economics," Robert Jensen talks about the difficulty of identifying Giffen behavior from data:

"Remember, we're looking for a positive correlation between price and consumption/demand — higher prices associated with higher quantity demanded, lower prices with lower quantity demanded. So, let's say we see a bunch of towns, and people living in those towns with the highest rice prices consume the most rice. Case closed, right? Not quite. Plain old economics tells us that if people want more of some good, its price goes up. So, we see high rice prices where there is high rice consumption, but did the high consumption cause the high price (economics as usual) or did the high price cause the high consumption (Giffen behavior)?"

Using supply and demand diagrams, explain what Jensen means.

Problem 8 (2 Points)

A and B are two goods that are substitutes for each other. Suppose the supply of A increases as a result of productivity increase. Using supply and demand diagrams, illustrate what happens to the equilibrium prices and quantities of A and B.

Problem 9 (6 Points)

The markets for corn and oil are described by the following demand and supply equations:

$$\begin{aligned}\text{Corn Demand: } & Q_D^C = 500 - 2p^C + p^O \\ \text{Corn Supply: } & Q_S^C = 10 + p^C \\ \text{Oil Demand: } & Q_D^O = 200 - 15p^O + 2p^C \\ \text{Oil Supply: } & Q_S^O = 50 + 4p^O\end{aligned}$$

, , where p^C is the price of corn (in \$/bushel), p^O is the price of oil (in \$/gallon), Q_D^C and Q_S^C are respectively the quantity demanded and supplied of corn (in bushels), and Q_D^O and Q_S^O are respectively the quantity demanded and supplied of oil (in gallons).

1. Solve for the equilibrium price and quantity of corn and oil. (2 Points)
2. Are corn and oil substitutes, complements, or neither? (2 Points)
3. Suppose as a result of technology progress, corn's supply curve becomes

$$Q_S^C = 65 + p^C$$

Solve for the new equilibrium price and quantity of corn and oil. Do your results agree with your answer to Problem 8 (2 Points)? (2 Points)