Problem Sets 10

1. A society of four individuals, A, B, C, and D, each characterized by his demand for automobiles, as given in the table. Assume that all automobiles are identical. The demand schedules for each person and for the group conform to the law of demand.

Car-ownership demands of A, B, C, and D

	Quantity of Automobiles				
Price ($)	A	B	C	D	Total
1,000	2	0	1	1	
900	2	0	1	1	
800	2	0	1	2	
700	2	0	1	2	
600	3	0	1	2	
500	3	1	1	2	
400	3	1	2	2	
300	3	1	2	3	
200	3	1	2	4	
100	4	2	2	4	

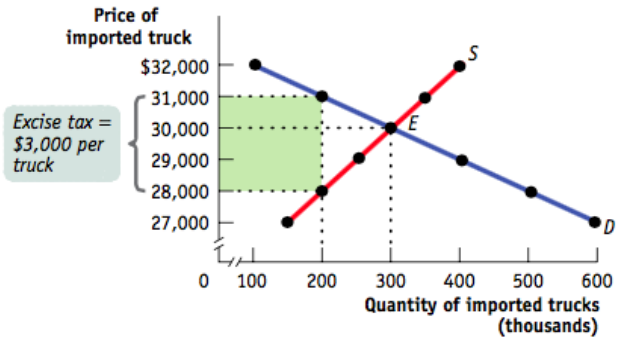
1) Fill in the last column and draw the market demand curve for automobiles.
2) Compare A's demand schedule with B's, can we infer that B is wealthier than A? Why?
3) Suppose there are seven cars in this community, what is the equilibrium price?
4) Suppose all seven cars are owned by A, others have none. If A would like to sell some of his cars at the price of $800 per unit, who will be the buyers? How many cars will be sold?
5) At $800, how many cars would A like to own? How many cars would he actually own?
6) At $800, is quantity demanded equal to quantity supplied? Is the market in equilibrium?
7) At $800, how would A maximize his net benefit and what is the corresponding net benefit?
8) Suppose all seven cars are owned by B while others have none. What would be the market equilibrium? What would be the total market welfare?

2. In many European countries high minimum wages have led to high levels of unemployment and underemployment, and to a two-tier labor system. In the formal labor market, workers have good jobs that pay at least the minimum wage. In the informal, or black market for labor, workers have poor jobs and receive less than the minimum wage.

1) Draw a demand and supply diagram showing the effect of the imposition of a minimum wage on the overall market for labor, with wage on the vertical axis and hours of labor on the horizontal axis. Your supply curve should represent the hours of labor offered by workers according to the wage, and the demand curve should represent the hours of labor demanded by employers according to the wage. On your diagram show the deadweight loss from the imposition of a minimum wage. What type of shortage is created? Illustrate on a diagram the size of the shortage.
2) Assume that the imposition of the high minimum wage causes a contraction in the economy so that employers in the formal sector cut their production and their demand for workers. Illustrate the effect of this on the overall market for labor. What happens to the size of the deadweight loss? The shortage? Illustrate with a diagram.
3) Assume that the workers who cannot get a job paying at least the minimum wage move into the informal labor market where there is no minimum wage. What happens to the size of the informal market for labor as a result of the economic contraction? What happens to the equilibrium wage in the informal labor market? Illustrate with a supply and demand diagram for the informal market.

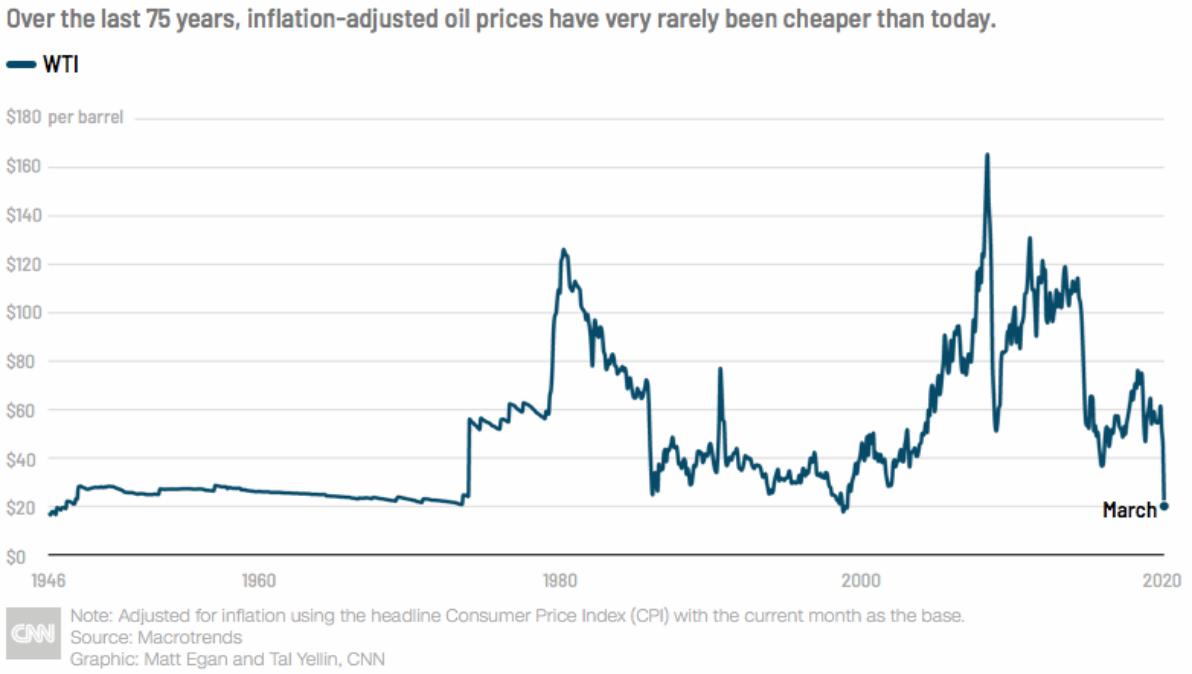
3. The U.S. government wants to help the American auto industry compete against foreign automakers that sell trucks in the United States. It can do this by imposing an excise tax on each foreign truck sold in the US. The hypothetical pre-tax demand and supply schedules for imported trucks are given below.

Price of imported truck	Quantity of imported trucks (thousands)	
	Quantity demanded	Quantity supplied
$32,000	100	400
31,000	200	350
30,000	300	300
29,000	400	250
28,000	500	200
27,000	600	150



1) In the absence of government interference, what is the market equilibrium of an imported truck?
2) Assume that the government imposes an excise tax of $3,000 per imported truck. Illustrate the effect of this excise tax in your diagram from part (1). How many imported trucks are now purchased and at what price? How much does the foreign automaker receive per truck?
3) Calculate the government revenue raised by the excise tax in part (2). Illustrate it on your diagram.
4) How does the excise tax on imported trucks benefit American automakers? Whom does it hurt? How does inefficiency arise from this government policy?

4. Global oil price has never in history collapsed as precipitously as it had in 2020. The historical WTI oil price is shown. Watch a video linked: 20200416 How the Oil Bust Could Reshape Global Markets | WSJ 4:17 [Link] Apply the market equilibrium model and production theory to questions below. [EC: 0.5 pts]



1) What are the specific demand and supply (D-S) factors that caused the most recent oil price crash?
2) Apply the D-S model to (1). Graph the initial equilibrium as point A and new equilibrium point B.
3) Which factor (D or S) is more crucial in slashing oil prices? What data are needed to verify the factor?
4) How would these factors affect consumer surplus and producer surplus? Explain with a graph.
5) When the oil price drops below $40 per barrel, a large number of US shale oil companies will shut down temporarily and some may close down for good (crude oil extraction/production cost in Saudi is about 10 dollars per barrel, 25 dollars per barrel in Russia). Apply the production theory and cost functions to explaining the firm's shut-down and exit decisions in the oil market. Be specific about the relationship between firms' cost structure and their shut-down and exit sequence. Which type of firm (in terms of cost structure) is the first to shut down in the market?
6) According to the U.S. Energy Information Administration, the United State, Saudi Arabia, and Russian together accounted for more than 40% of the global oil production in 2019. While the U.S. is the largest oil producer in the world, its production does not have much cost advantage and must import oil from outside to meet its domestic demand. Apply the monopoly/duopoly/oligopoly model to explaining the oil price slash/crash from the supply shock resulting from the geopolitical conflicts between Saudi Arabia and Russia.
7) Net U.S. energy imports have decreased every year since 2016. Last year's change in net energy trade (crude oil, natural gas, coal, and petroleum products) in the US—from 3.6 quads of net imports in 2018 to 0.8 quads of net exports in 2019—was the largest change in U.S. energy trade since 1980. How would the low oil price affect the U.S. crude oil import and export in 2020? Apply the D-S model.
8) To help domestic oil producers, including a large number of shale companies, financed by a vast amount of external capital and debt, survive the sharp 2020 economic downturn, suppose the U.S. government can provide loans (subsidies) or/and impose higher tariff on oil imports. Apply the D-S Model to analyzing the welfare effects of two different policies on the U.S. oil market separately.