Microeconomics for Public Policy I
Fall 2017

**Problem Set 10**
Due Lecture 12 in class on paper

1. GLS Chapter 9, Question 6

(a) Are these goods elastic or inelastic?

Remember that the elasticity of demand is

$$E_D = \frac{\%\Delta Q}{\%\Delta P}$$

This problem gives both parts of the equation for both Clive and Delores.

For Clive,

$$E_D = \frac{\%\Delta Q}{\%\Delta P} = \frac{0.0667}{-0.1} = -0.667$$

Because this elasticity is less than one, we say that demand for cloves from Clive is inelastic.

For Delores,

$$E_D = \frac{\%\Delta Q}{\%\Delta P} = \frac{0.0667}{-0.02} = -3.335$$

Because the absolute value of this elasticity is greater than one, we say that the demand for cloves from Delores is elastic.

(b) Marignal revenue

Clive's marginal revenue is the difference in revenue from the 16th unit to the 15th unit. The revenue with 16 units is $R_{Q=16} = PQ = (4.50)(16) = 72$. The revenue with 15 units is $R_{Q=15} = PQ = (5.00)(15) = 75$. Therefore, $MR_{Q=16} = 72 - 75 = -3$.

We calculate Delores's marginal revenue in a similar fashion. The revenue with 16 units is $R_{Q=16} = PQ = (4.90)(16) = 78.40$. The revenue with 15 units is $R_{Q=15} = PQ = (5.00)(15) = 75$. Therefore, $MR_{Q=16} = 78.40 - 75 = 3.40$.

(c) The more elastic the demand, the greater the increase in marginal revenue from an increase in price. Intuitively, the more elastic the demand, the less likely people are to drop out of the market when price increases.

2. GLS Chapter 9, Question 20

(a) Find the profit maximizing $P$ and $Q$, producer surplus, consumer surplus, and deadweight loss.

To find the profit maximizing $P$ and $Q$, find the $Q$ where $MR = MC$.

Begin by finding $MR$, using the formula from the textbook. We can write $MR = 15 - 2(0.33)Q$.

(Aside if you know calculus: $MR = \frac{\partial PQ}{\partial Q} = \frac{\partial(15Q - 0.33Q^2)}{\partial Q} = 15 - 0.66Q$.)

Using this formula, we set $MR = MC$: $15 - (2/3)Q = 1$, or $Q = 14/(2/3) = 21$.

At a quantity of 21, producers would like to sell for the highest price possible, which is where $Q = 21$ intersects the demand curve. To find this, plus $Q = 21$ into $P = 15 - (1/3)Q$, and we can write that $P = 15 - (1/3)21 = 8$.

See the picture at the end for the boxes denoting consumer surplus, producer surplus, and deadweight loss.

Consumer surplus is the area above the equilibrium price of 8 and below the demand curve. The value of the consumer surplus triangle is $CS = \frac{1}{2}bh = \frac{1}{2}(21)(15 - 8) = 73.5$.

Producer surplus is the box above the marginal cost line and below the market equilibrium price. Thus, $PS = bh = 21(7) = 147$.

Deadweight loss is the area below the demand curve where trades that would occur in a perfectly competitive market do not take place. So $DWL == \frac{1}{2}bh = \frac{1}{2}(42 - 21)(8 - 1) = 73.5$.

(b) How much could residents gain from the brewery selling at marginal cost?

The maximum that consumers would gain is the sum of producer surplus and deadweight loss – producer surplus would go to zero, and there would be no deadweight loss. All surplus would accrue to consumers.

(c) The brewery wants to be no worse off. To be no worse off, they need to get their market power level of consumer surplus.

(d) The townspeople and the brewery could agree to an amount between $PS$ and $PS+DWL$ for the townspeople to pay the brewery to produce at $P = MC$.

3. GLS Chapter 9, Question 21

(a) Is the firm a natural monopoly? No, because $LATC$ is always decreasing over the range of output that anyone would like to purchase.

(b) Will the firm earn positive profits if not subject to regulation?

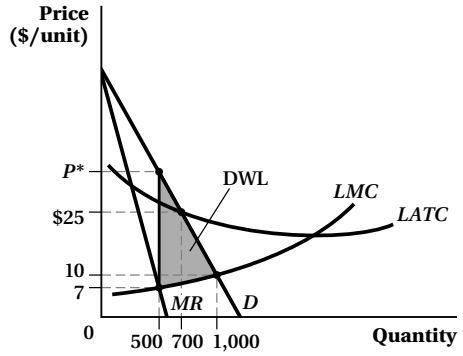
Without regulation, the firm will set $MR = MC$, so it will produce 500 units (from picture, where $MR = MC$) and sell them at a very high price. We know that the firm would make a profit because it will price on the demand curve where $Q = 500$. Here revenues exceed costs (because price is greater than $LATC$).

(c) If the government does not allow production in excess of marginal cost, the best the firm can do is equate marginal cost and demand (where $Q = 1000$ and $P = 10$). In this case, however, average costs exceed the price ($LATC > 10$), and the firm fails to make money.

(d) If the firm can charge no more than $LATC$, the firm will produce 700 units at a price of 25. Production here is lower than the social optimal production of 1000 units, so there will still be lower than optimal consumer surplus and a deadweight loss.

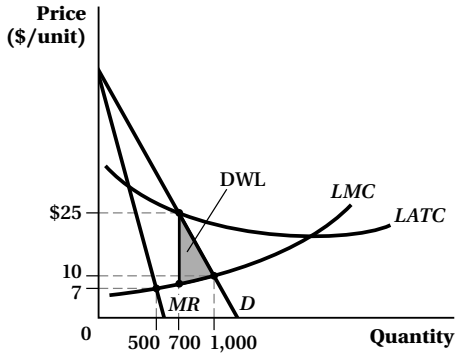
(e)

Case 1: Monopoly.




Case 2: Under the government regulation, $P = LMC$. There is no deadweight loss.

Case 3: Under the government regulation, $P = LATC$.




4. Monopolies and the Long Run

Use a few paragraphs to describe an industry that used to have market power and that now does not; explain why.

Any reasonably argued example is acceptable here.

Q 20