This problem set is based on Chapter 15 & 16 of Varian 2014

Problem 6: Market Demand and Elasticity

Suppose the fisherman we talked about last time faces the following inverse demand curve in the local market:

$$P(q) = a - bq$$

- What is the demand curve he faces? Solve for it.
- Derive a close form solution for the price elasticity of demand.
- At which point is the price elasticity of demand $0, -1$ and $-\infty$

Now suppose that the inverse demand function he faces is instead given by:

$$p(q) = \frac{1}{A} q^{\frac{1}{-\epsilon}}$$

- What is the price elasticity of demand?
- What is the fisherman's *revenue* R, as a function of price p?
- What is the relationship between the fisherman's revenue and the price elasticity of demand in the local market?
- What is the key parameter, A or ϵ?
- For which values of the key parameter you just identified does the fisherman's revenue increases, decreases or stays the same if he increases the price at which he sells his fish?

Problem 7: Market Equilibrium

Let us follow the exercise in the book. Suppose that the local taco market has demand function of $Q_D(p) = a - bp$ and a supply funtion of $Q_S = dp - c$

- Graph both curves.
- What is the market equilibrium? Derive the close-form expression.
- Now suppose a local politician implements a per-taco tax. What happens to the local taco market? Is there deadweight loss? Who pays for the tax, taqueros (suppliers) or taco-eaters (consumers)?
- Now imagine that, instead of analyzing the taco market, we are analyzing the market for insulin. A representative person in the insulin market requires at least Q_{ins} per day to stay alive, not more, not less. Suppose that insulin suppliers share the same supply curve as taqueros. What can you say about insulin's price elasticity of demand?
- If a local politician decided to implement a tax on insulin, who would bear the tax? Would there be a deadweight loss? Discuss.
- Now imagine that, instead of analyzing the insulin market, we are analyzing the market for a specific type of tree that takes thousands of years to grow. Suppose that demand for this tree is $Q_D(p) = a - bp$, and that the amount of tress ready to harvest is Q_{trees}. If a local politician decided to implement a per-tree tax, who would bear the tax?

References

Varian, H. R. (2014). *Intermediate Microeconomics: A Modern Approach*. 9th ed. W. W. Norton & Company.