4.3 Linear Response Curve

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Summary	• Linear response curve • Constant elasticity curve

- What is linear response curve?
- Define market size
- Define satiating price
- Elasticity formula in terms of linear response curve
- When price $= 0$
  - Elasticity = ?
- When price $\rightarrow P_S$
  - Elasticity = ?

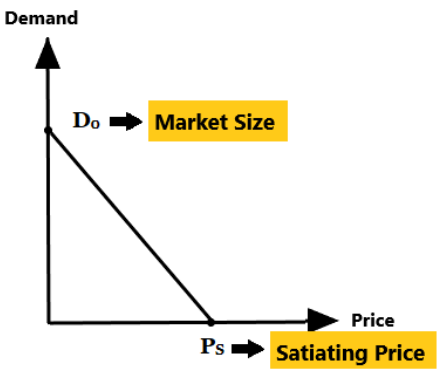
Linear response curve

- Simplest Price Response Curve:

$$D(p) = D_0 - m * p$$

where, D_0 is the demand at price = 0 (this is called the market size) and m is the slope.

- The price at which demand = 0 is called the satiating price, $P_s = \frac{D_0}{m}$.
- The elasticity of this curve is $\epsilon = \frac{m*p}{D_0 - m*p}$.
- We see that $\epsilon = 0$ when $p = 0$. $And\ as\ p \rightarrow P_s, \epsilon \rightarrow \infty$.



- Constant Elasticity curve
- Revenue formula

Constant elasticity curve

- After algebraic transition, the constant elasticity curve is given by:

$$D = Cp^{-\epsilon}$$

where C is a constant (it is the Demand when price = 1).

- It is not guaranteed that the demand is either finite or satiated ($D \rightarrow \infty, as\ p \rightarrow 0. Also, D \neq 0, for\ any\ p$).
- Revenue is $R = p * D = Cp^{(1-\epsilon)}$.
- $D(p) = D(1)\ p^{-\varepsilon}$

- How to increase revenue for products with:
  1. Inelastic demand
  2. Elastic demand

Constant elasticity curve

We notice that:

- When $\epsilon < 1$, (inelastic product demand) the revenue can be increased by simply increasing the prices.
- When $\epsilon > 1$ (elastic demand) the revenue can only be increased by setting price close to zero.

- To increase revenue for products with
  - Inelastic demand: Increase the price
  - Elastic demand: Set the price close to zero
    - Huge demand ⇒ Increased revenue