Revenue and Price elasticity of demand

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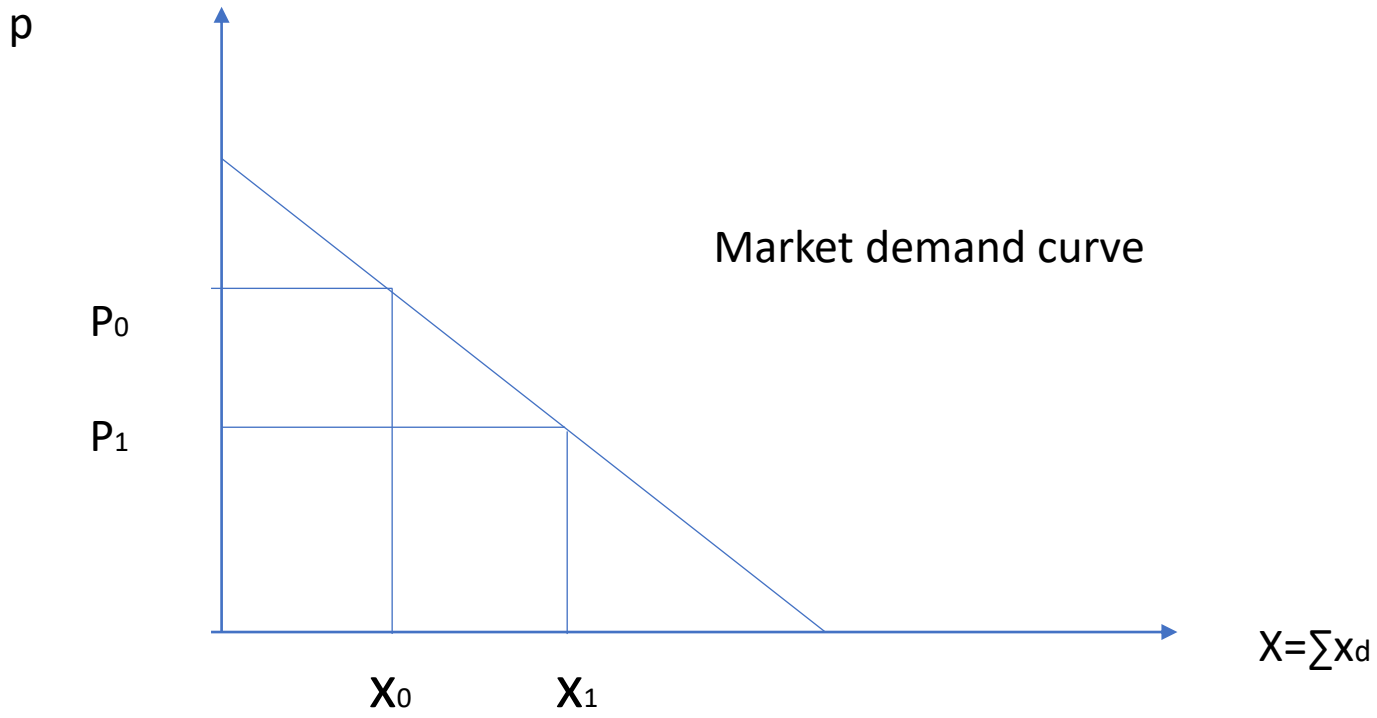
Relationship between revenue & price elasticity of demand

- Demand schedule as the AR schedule: sellers' view of the demand curve



Concepts of TR , AR, MR

- Uniform pricing: $TR(x_0) = p(x_0)\, x_0$

$$TR(x_1) = p(x_1)\, x_1$$

$$TR(x) = p(x)x \text{ for all } x > 0$$

- AR = TR/x= P(x) = per unit revenue= Market dd

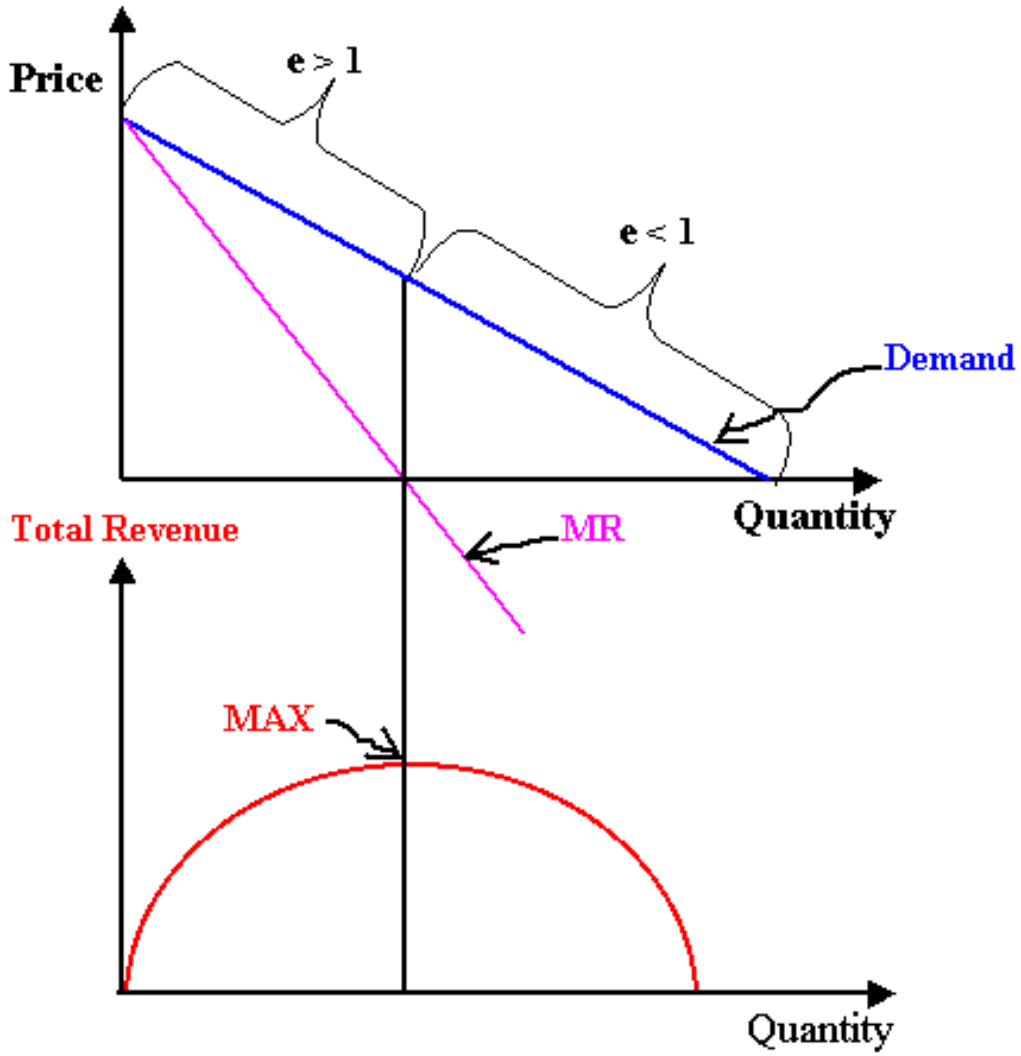
The demand curve appears as the AR curve to the seller.

- MR= Change in TR when one extra unit is sold

Revenue and Price elasticity of demand

$$MR = \frac{\partial TR}{\partial x} = P(x) + x\frac{\partial P}{\partial x} = P(x)\left[1 + \frac{x}{P}\frac{\partial P}{\partial x}\right]$$

$$MR == P(x)\left[1 - \frac{1}{|e_p|}\right]$$


Price
e > 1
e < 1
Demand
Quantity
Total Revenue
MR
MAX
Quantity

Properties of MR curve

$i) \frac{\partial P}{\partial x} < 0 \Rightarrow MR < AR$ for all x>0

That means, as long as demand curve is negatively sloped, MR<AR.

If x=0, MR=AR.

$$ii) MR = P + x\frac{\partial P}{\partial x} < 0 \Rightarrow \frac{\partial MR}{\partial x} = 2\frac{\partial P}{\partial x} = 2\frac{\partial AR}{\partial x} \; for\ all\ linear\ demand\ fn.$$

That means, MR curve is linear, when demand curve is linear.

Also, MR falls as x increases if law of demand holds.

$$iii)a)\left|e_p\right| > 1 \Rightarrow MR > 0$$

$$b)\left|e_p\right| < 1 \Rightarrow MR < 0$$

$$c)\left|e_p\right| = 1 \Rightarrow MR = 0$$

TR curve

$\widehat{TR} = \hat{p} + \hat{x}$

$\hat{x} > \hat{p} \Rightarrow ep > 1 \Rightarrow \widehat{TR} > 0$

$\hat{x} < \hat{p} \Rightarrow ep < 1 \Rightarrow \widehat{TR} < 0$

$\hat{x} = \hat{p} \Rightarrow ep = 1 \Rightarrow \widehat{TR} = 0$

TR = 0 when x = 0

TR= p(x).x for all x>0

References:

- Maddala & Miller
- Pindyck & Rubinfeld