$$NB = B(x) - P_d x$$

$$\pi = n(NB)\left[R + (P_s - c)x\right]$$

$$\frac{d\pi}{dx} = \frac{dn(NB)}{dx}\left[R + (P_s - c)x\right] + (P_s - c)\,n(NB)$$

$$= \left(n'(NB)\left(B'(x) - P_d\right)\right)\left[R + (P_s - c)x\right] + (P_s - c)\,n(NB) = 0$$

$$n'(NB)\left(B'(x) - P_d\right)\left(R + (P_s - c)x\right) = -(P_s - c)\,n(NB)$$

$$\left(B'(x) - P_d\right)\cdot\frac{\left(R + (P_s - c)x\right)}{(P_s - c)} = -\frac{n(NB)}{n'(NB)}$$

$$\varepsilon_p = \frac{\%\Delta Q_D}{\%\Delta P} = \frac{dx}{dp}\cdot\frac{P}{X}$$

$$\varepsilon_{n,NB} = \frac{dn(NB)}{dNB}\cdot\frac{NB}{n(NB)}$$

$$= n'(NB)\cdot\frac{NB}{n(NB)}$$

$$\frac{B'(x) - P_d}{NB}\cdot\frac{R + (P_s - c)x}{P_s - c} = -\frac{n(NB)}{n'(NB)\cdot NB} = -\frac{1}{\varepsilon_{n,NB}}$$

$$\underbrace{\left(\frac{B'(x) - P_d}{NB}\right)}\underbrace{\left(\frac{R + (P_s - c)x}{P_s - c}\right)} = \underbrace{-\frac{1}{\varepsilon_{n,NB}}}$$

$B'(x) < P_d$ $\quad \boxed{P_s > C} \quad > 0 \quad\quad < 0$

$B'(x) > P_d$ $\quad \boxed{P_s < C \quad R \text{ IS BIG}} \quad < 0 \quad\quad < 0$