

6 Quality Competition

$$\begin{array}{lll}
 U(x), V(q) > 0 & U'(x), V'(q) > 0 & U''(x), V''(q) < 0 \\
 c(q) > 0 & c'(q) \leq 0 & c''(q) > 0
 \end{array}$$

$$\max_{x,y} U(x)V(q) + y \quad \text{s.t.} \quad \bar{y} = y + Px$$

$$U'(x)V(q) = P$$

$$\max_{q,x} (P - c(q))x$$

$$P = c(q)$$

$$c'(q) = 0$$

$$U'(x)V(q) = c(q)$$

$$\max_{x,q} U(x)V(q) + \bar{y} - c(q)x$$

$$U'(x)V(q) = c(q)$$

$$U(x)V'(q) = c'(q)x$$