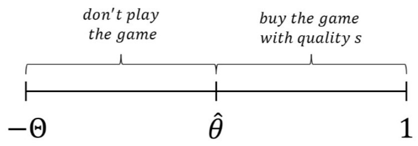
BA_Patrice_Bolz_Calculations_1

Tuesday, December 3, 2024 2:54 PM

P2P

$$u = \begin{cases} \theta s + t s Q - p, & \text{falls Konsum} \\ 0, & \text{kein Konsum} \end{cases}$$



Ind. consumer θ

$$\hat{\theta} s + t s Q - p = 0 \quad | + p \quad | - t s Q$$

$$\hat{\theta} s = t s Q + p \quad | : s$$

$$\hat{\theta} = t Q + \frac{p}{s}$$

$$\Rightarrow 1 - \hat{\theta} = Q$$

$$1 - t Q - \frac{p}{s} = Q \quad | + t Q$$

$$1 - \frac{p}{s} = Q + t Q$$

$$\frac{s}{s} - \frac{p}{s} = Q(1+t) \quad | : (\ )$$

$$\frac{s-p}{s(1+t)} = Q$$

Profit Maximization

$$\max_p \Pi = p \cdot Q = p \left(\frac{s-p}{s(1+t)} \right)$$

$$\frac{\partial \Pi}{\partial p} = \frac{s - 2p}{s(1+t)} = 0 \quad | \cdot s(\ )$$

$$s - 2p = 0$$

$$p^* = \frac{s}{2}$$

$$Q^* = \frac{s - \frac{s}{2}}{s(1+t)} = \frac{\frac{1}{2} \cancel{s}}{\cancel{s}(1+t)}$$

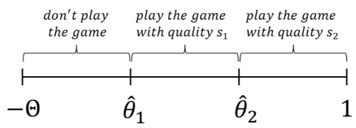
$$\Leftrightarrow \frac{1}{s(1+t)2}$$

$$\pi^* = p^* \cdot Q^* = \frac{s}{2} \cdot \frac{1}{(1+t)2}$$

$$= \frac{}{(1+t)4}$$

F2P

$$U = \begin{cases} \theta s_2 + t s_2 Q - p_2, & \text{falls } s_1 \text{ konsument} \\ \theta s_1 + t s_1 Q - p_1, & \text{falls } s_2 \text{ konsumiert} \\ 0, & \text{kein konsum} \end{cases}$$



1. Ind. Consumer $\hat{\theta}_1$

$$\theta_1 s_1 + t \cdot s_1 \cdot Q - p_1 = 0 \quad |$$

$$\theta_1 s_1 = p_1 - t \cdot s_1 \cdot Q \quad | \; Q = 1 - \theta_1$$

$$\theta_1 \cdot s_1 = p_1 - t \cdot s_1 (1 - \theta_1)$$

$$\theta_1 \cdot s_1 = p_1 - t \cdot s_1 + \theta_1 \cdot t \cdot s_1 \quad | - \theta_1 \cdot t \cdot s_1$$

$$\theta_1 \cdot s_1 - \theta_1 t \cdot s_1 = p_1 - t \cdot s_1$$

$$\theta_1 (s_1 - t \cdot s_1) = p_1 - t \cdot s_1 \quad | : (\;\;)$$

$$\hat{\theta}_1 = \frac{p_1 - t \cdot s_1}{(1-t) \cdot s_1} \qquad (1)$$

2. Ind. consumer $\hat{\theta}_2$

$$\theta_2 s_2 + t Q - p_2 = \theta_1 s_1 + t s_1 Q - p_1 \quad | \; Q = (1 - \theta_1)$$

$$\theta_2 s_2 + t s_2 (1 - \theta_1) - p_2 = \theta_1 s_1 + t s_1 (1 - \theta_1) - p_1$$

$\downarrow$ * $\qquad\qquad\qquad\qquad$ $\downarrow$ *

$$\hat{\theta}_2 s_2 + t s_2 (1 - \hat{\theta}_1) - p_2 = \hat{\theta}_1 s_1 + t s_1 (1 - \hat{\theta}_1) - p_1$$

$$\hat{\theta}_2 (s_2 - s_1) + t \cdot (1 - \hat{\theta}_1)(s_2 - s_1) = p_2 - p_1$$

* Spieler muss indifferent sein. Daher handelt es sich hier um die gleiche Person und $\hat{\theta}$ beschreibt ihn

$$\hat{\theta}_2 = \frac{p_2 - p_1}{s_2 - s_1} - t \cdot (1 - \hat{\theta}_1) \qquad \Big| \text{ Substituiere } \theta_1 \text{ mit Gl. } (1)$$

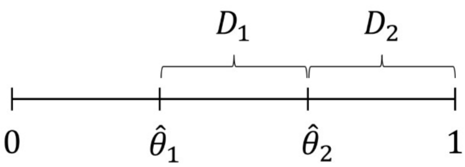
$$\hat{\theta}_2 = \frac{p_2 - p_1}{s_2 - s_1} - t\left(1 - \frac{p_1 - t \cdot s_1}{(1-t) s_1}\right)$$

$$\hat{\theta}_2 = \frac{p_2 - p_1}{s_2 - s_1} - t \cdot \left(\frac{s_1 - t s_1 - p_1 + t s_1}{(1-t) s_1}\right)$$

$$\hat{\theta}_2 = \frac{p_2 - p_1}{s_2 - s_1} - t \cdot \left(\frac{s_1 - p_1}{(1-t) s_1}\right)$$

Profit Maximization

$$\max_{p_1, p_2} \Pi = p_1(\hat{\theta}_2 - \hat{\theta}_1) + p_2(1 - \hat{\theta}_2)$$



$$\Pi = p_1\left(\frac{p_2 - p_1}{s_2 - s_1} - \frac{\cancel{t \cdot}(\cancel{s_1} - p_1)}{(1-t) s_1} - \frac{p_2 - \cancel{t s_1}}{(1-t) s_1}\right) + p_2\left(1 - \frac{p_2 - p_1}{s_2 - s_1} + \frac{t \cdot (s_1 - p_1)}{(1-t) s_1}\right)$$

$$\frac{\partial \Pi}{\partial p_2} = 1 - \frac{2p_2 - p_1}{s_2 - s_1} + \frac{t(s_1 - p_1)}{(1-t) s_1} + \frac{p_1}{s_2 - s_1} = 0$$

$$1 - \frac{2(p_2 - p_1)}{s_2 - s_1} + \frac{t \cdot (s_1 - p_1)}{(1-t) s_1} = 0 \qquad \Big| \cdot (s_2 - s_1)$$

$$(s_2 - s_1) - 2(p_2 - p_1) + \frac{t \cdot (s_1 - p_1)(s_2 - s_1)}{(1-t) s_1} \qquad \Big| : 2$$

$$\frac{s_2 - s_1}{2} - (p_2 - p_1) + \frac{t(s_1 - p_1)(s_2 - s_1)}{(1-t) s_1 \cdot 2} = 0 \qquad \Big| + p_2$$

$$p_2 = \frac{(s_2 - s_1)}{2} + \frac{t \cdot (s_1 - p_1)(s_2 - s_1)}{(1-t) s_1 \cdot 2} + p_1 \qquad II)$$

$$\frac{\partial \Pi}{\partial p_1} = \frac{p_2 - p_1}{s_2 - s_1} - \frac{(1-t)\,p_1}{(1-t)\,s_1} - \frac{p_1}{s_2 - s_1} - \frac{(1-t)\,p_1}{(1-t)\,s_1} + \frac{p_2}{s_2 - s_1} + \frac{-t\,p_2}{(1-t)\,s_1}$$

$$\frac{2(p_2 - p_1)}{s_2 - s_1} - \frac{2\cancel{(1-t)}p_1}{\cancel{(1-t)}s_1} - \frac{p_2 t}{(1-t)s_1} = 0$$

$$\frac{2(p_2 - p_1)s_1}{(s_2 - s_1)s_1} - \frac{2p_1(s_2 - s_1)}{(s_2 - s_1)s_1} - \frac{p_2 t}{(1-t)s_2} = 0$$

$$\frac{2p_2 s_1 - \cancel{2p_1 s_1} - 2p_1 s_1 + \cancel{2p_1 s_1}}{(s_2 - s_1)s_1} - \frac{p_2 t}{(1-t)s_1} = 0 \quad \Big| + \frac{2p_1 s_1}{(s_2 - s_1)s_1}$$

$$\frac{2p_2 s_1}{(s_2 - s_1)s_1} - \frac{p_2 t}{(1-t)s_1} = \frac{2p_1 s_2}{(s_2 - s_1)s_1} \quad \Big| \,(s_2 - s_1)s_1$$

$$2p_2 s_1 - \frac{p_2 t(s_2 - s_1)}{(1-t)} = 2p_1 s_2 \quad \Big| : 2s_2$$

$$p_1 = \frac{p_2 s_1}{s_2} - \frac{p_2 t(s_2 - s_1)}{(1-t)2s_2} \qquad \text{I)}$$

⇒ Der Rest wurde mit Wolfram jedoch Alpha berechnet.
Die Datei finden Sie im gleichen Ordner wie dieses Dokument.

⇒ Es wurden für die Parameter andere Zeichen verwendet:

$p_1 \Rightarrow x$

$p_2 \Rightarrow y$

$a \Rightarrow s_1$

$b \Rightarrow s_2$

$t = t$