Econ 8601: Industrial Organization
Lecture 1
The Cost of Monopoly in General Equilibrium

- Set of goods $[0,1]$, $x \in [0,1]$ a particular good.
- Utility function of representative consumer

$$
\begin{aligned}
U &= \left(\int_0^1 q(x)^{\frac{1}{\mu}} dx \right)^{\mu} \\
\sigma &= \frac{\mu}{\mu - 1}
\end{aligned}
$$

  for $\mu > 1$.
- Unit time endowment .

- Technology: one unit of labor per unit of good.
- Let labor be numeraire, $w = 1$
  Goods $x \in [0, \lambda]$ are controlled by a monopolist
- Goods $x \in (\lambda, 1]$ are perfectly competitive.
- The representative consumer owns shares in all the firms.

Solution

- Let π_M be the equilibrium monopoly profit of a representative monopolist.
- Income of the representative consumer

$$I = 1 + \lambda \pi_M.$$

- $p_C = 1$.
- Constant elasticity of demand $\Rightarrow$the price in monopoly industries is $p_M = \mu$.
- Let q_M and q_C be quantities in the equilibrium of this economy.

- Consumer MRS implies:

$$\frac{q_M}{q_C} = \left(\frac{p_M}{p_C}\right)^{-\sigma}$$

But $p_C = 1$ and $p_M = \mu$, so

$$q_M = q_C \mu^{-\sigma}$$

- Resource constraint for labor,

$$\begin{aligned} \lambda q_M + (1-\lambda) q_C &= 1 \\ \lambda q_C \mu^{-\sigma} + (1-\lambda) q_C &= \\ q_C &= \frac{1}{(1-\lambda+\lambda\mu^{-\sigma})} \end{aligned}$$

Welfare gains from antitrust

- v be the compensating variation (the change in income at the new prices so the representative consumer is indifferent to old system).
- New prices, $p = 1$ everywhere.
- $Y = 1 - v$ be income.
- $U = Y$ and

$$\begin{aligned}
1 - v &= \left(\lambda q_M^{\frac{1}{\mu}} + (1-\lambda)\, q_C^{\frac{1}{\mu}}\right)^{\mu} \\
&= \left(\lambda \left(q_C \mu^{-\sigma}\right)^{\frac{1}{\mu}} + (1-\lambda)\, q_C^{\frac{1}{\mu}}\right)^{\mu} \\
&= q_C \left(\lambda \mu^{-\frac{\sigma}{\mu}} + 1 - \lambda\right)^{\mu} \\
&= \frac{\left(\lambda \mu^{-\frac{\sigma}{\mu}} + 1 - \lambda\right)^{\mu}}{\left(1 - \lambda + \lambda \mu^{-\sigma}\right)}
\end{aligned}$$

or

$$v = 1 - \frac{\left(1 - \lambda + \lambda\mu^{-\frac{1}{\mu-1}}\right)^{\mu}}{\left(1 - \lambda + \lambda\mu^{-\frac{\mu}{\mu-1}}\right)}$$

Observe that

$$\lim_{\mu \to 1} \mu^{-\frac{1}{\mu-1}} = \lim_{\mu \to 1} \mu^{-\frac{\mu}{\mu-1}} = .3679$$

So

$$\lim_{\mu \to 1} v = 0$$

The Value of ν by μ and λ

μ	λ						
	0	.2	.4	.6	.8	.9	1.0
1.1	.000	.005	.009	.012	.011	.007	.000
1.5	.000	.025	.045	.058	.053	.036	.000
2.0	.000	.047	.086	.109	.100	.069	.000
5.0	.000	.141	.248	.312	.301	.227	.000

Discussion

- Pretty old idea that 100% won't distort (Joan Robinson 1934)
- Allocative Distortions gets attention in Macro Literature
  - Hsieh and Klenow (2009), Restucia and Rogerson (2008)
- Papers working this angle with trade (opening up trade lowers monopoly power)
  - Edmond, Virgiliu Xu (AER 2015)
  - Holmes, Hsu, Lee (Journal of International Economics, 2014)
- Other costs of monopoly besides allocative distortions
  - Rent Seeking (could dissipate the profit)
    - Posner, Hsieh and Moretti (JPE 2003) example of real estate agents.
    - broadly can be considered an allocative distortion, too much resouces allocated to entry. Difference is the loss is a "square," note a triangle.
  - Effect of competition on productivity
    - Old papers by Holmes and Schmitz

Efficiency Of Free Entry: Example Models of Mankiw and Whinston

- Homogenous product market demand $P(Q)$, Q total output. $P'(Q) < 0$
- Fixed cost ϕ
- Variable costs $c(q)$, $c(0) = 0$, $c'(q) \geq 0$, $c''(q) \geq 0$.
- Second stage, output per entrant is determined. Let q_N be equilibrium output per firm, given N entrants (you pick model of competition). But assume (easy to check this is satisfied with Cournot and $P''(Q) \leq 0$):
  - $Nq_N > \hat{N}\hat{q}_N$, $N > \hat{N}$ and $\lim_{N\to\infty} Nq_N = M < \infty$
  - $q_N < q_{\hat{N}}$, for $N > \hat{N}$.
  - $P(Nq_N) - c'(q_N) > 0$ for all N.
- First stage entry: N^e, then $\pi_{N^e} \geq 0$, and $\pi_{N^e+1} < 0$.

Social Planner

- Planner controls entry but not pricing given entry.
- Maximizes total surplus. So problem is

$$\max_N W(N) = \int_0^{Nq_N} P(s)ds - Nc(q_N) - N\phi$$

- Ignore integer constraint, for now. The Planner's FONC is

$$\begin{aligned} W'(N^*) &= P(Nq_N)\left[N\frac{\partial q_N}{\partial N} + q_N\right] - c(q_N) - Nc'(q_N)\frac{\partial q_N}{\partial N} - \phi \\ &= [Pq_N - c - \phi] + N\left[P - c'\right]\frac{\partial q_N}{\partial N} \\ &= \pi_N + N\left[P - c'\right]\frac{\partial q_N}{\partial N} \\ &= 0 \end{aligned}$$

- Evaluate at N^e, observe that $\pi_{N^e} = 0$, so $W'(N^e) < 0$, (since $P > c'$, and $\frac{\partial q_N}{\partial N} < 0$. Excessive entry.
- Intuition
- If impose the integer constraint then $N^e \geq N^* - 1$.