

Monopoly

Industrial Organization

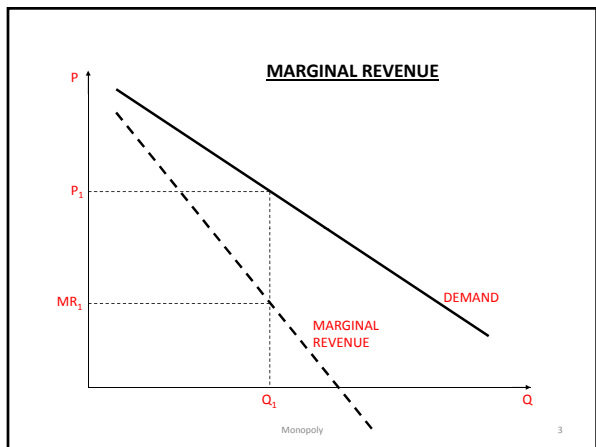
K. Graddy

Monopoly 1

Monopoly

- A single seller
- Therefore firm faces entire market demand curve
- Why are there no more sellers?
 - There must be some form of **barrier to entry**:
 - Natural
 - Legal
 - Bain's Barriers to Entry

Monopoly 2



Marginal Revenue with linear demand

- Linear Demand Curve:

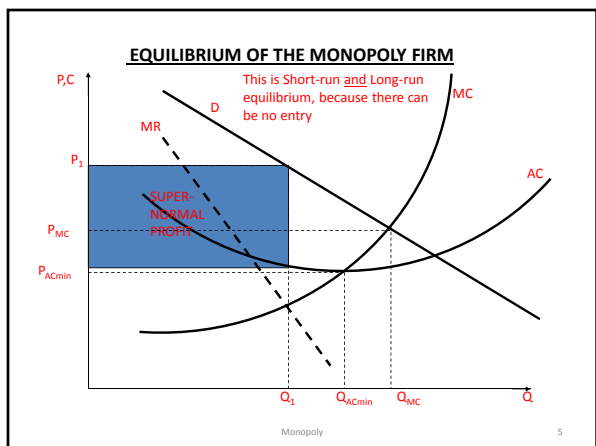
$$P = a - bQ$$
- Total Revenue:

$$TR = P \times Q = aQ - bQ^2$$
- Marginal Revenue:

$$MR = dTR/dQ = a - 2bQ$$

• Thus Marginal Revenue is also a straight line, with same intercept and twice the slope

Monopoly 4



Monopoly

$$\pi = R - C$$

$$FOC: MR - MC = 0$$

$$\pi = P(q)q - C(q)$$

$$FOC: P(q) + q * \frac{\partial P(q)}{\partial q} = C'(q)$$

$$P(q) + q * \frac{\partial P(q)}{\partial q} * \frac{P(q)}{P(q)} = C'(q)$$

$$P(q) + \frac{P(q)}{\epsilon} = C'(q)$$

$$\frac{P - MC}{P} = \frac{1}{\epsilon} \text{ (Inverse elasticity rule)}$$

Monopoly 6

Perfect Competition

$$\pi = R - C$$

$$FOC : MR - MC = 0$$

$$\pi = P(Q)q - C(q)$$

$$FOC : P(Q) = C'(q)$$

Monopoly

$$\pi = R - C$$

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Monopoly 7

The Price-Cost Margin and the Lerner Index

- Note that the price cost margin (equal to the inverse elasticity) is also known as the Lerner index of market power.

$$L = \frac{P - MC}{P}$$

which, in a monopoly

$$= \frac{1}{\varepsilon}$$

Monopoly 8

Monopolistic Inefficiencies

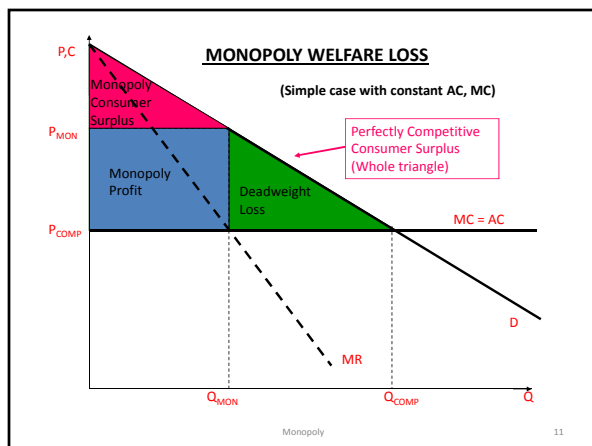
- Price not equal to Marginal Cost
- Price not equal to Minimum Average Cost
- Output below Perfectly Competitive Output
- Output not necessarily produced at AC_{min}
- Supernormal Profits persist in long run

Monopoly 9

How Socially Damaging is the Monopoly Equilibrium?

- Higher price leads to loss of consumer surplus
- But much of this is a transfer to monopoly profits
- “Deadweight loss” is measured by welfare triangle and may not be large
- However “X-Inefficiency” – lack of competitive pressures allows costs to drift upwards and may induce much larger social losses although monopoly profits may not appear to be high

Monopoly 10



Costs of Monopoly (Harberger 1954)

Attempted to measure deadweight loss triangles from monopoly power:

$$\Delta W = \frac{1}{2} \Delta q \Delta p \text{ where } \Delta p = p - c$$

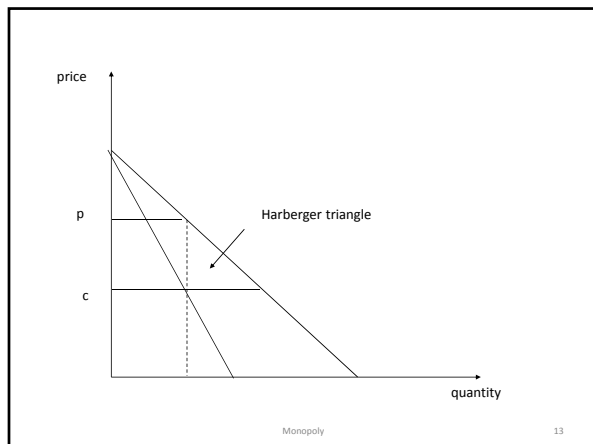
Profit margin M is $M = \frac{\Delta p}{p} \Rightarrow \Delta p = Mp$

Elasticity of demand ε is

$$\varepsilon = \frac{\frac{\Delta q}{q}}{\frac{\Delta p}{p}} = \frac{\Delta q}{M} \Rightarrow \Delta q = Mq\varepsilon$$

So, deadweight loss is $\Delta W = \frac{1}{2} \Delta q \Delta p = \frac{1}{2} M^2 pq\varepsilon$

Monopoly 12



Harberger assumed:

$$\varepsilon=1$$

Average profits are the competitive level;

Excess profits are those over the average level

Monopoly losses calculated using $\Delta W = M^2 pq / 2$

Data: 73 sectors averaged over 1924-1928

Estimated social loss from monopoly is 0.1% of GNP

Implication (Harberger, 1954, p.87)

Our economy emphatically does not seem to be monopoly capitalism in big red letters. We can neglect monopoly elements and still gain a very good understanding of how our economic process works and how our resources are allocated. When we are interested in the big picture of our manufacturing economy, we need not apologize for treating it as competitive for in fact it is awfully close to being so.

Criticisms:

1. Profit rates are not accurate: monopoly profits capitalised in asset values; monopoly profits absorbed in X-inefficiency; average profits will include some monopoly elements so will be higher than the competitive rate.
2. $\varepsilon \neq 1$
3. Cross ε are wrongly assumed zero: too partial. Need general equilibrium approach.
4. Level of aggregation too high - industry rather than firm level.
5. Posner JPE 1975: waste is incurred acquiring and maintaining a monopoly position

Cowling and Mueller EJ 1978

Drop the $\varepsilon=1$ assumption by assuming all firms maximize profits. We then have the inverse elasticity rule:

$$M = \frac{p-c}{p} = \frac{1}{\varepsilon} \Rightarrow \varepsilon = \frac{p}{p-c}$$

From above, remember, $\Delta W = \frac{1}{2} M^2 pq \varepsilon$

$$\text{If } M = \frac{1}{\varepsilon}, \text{ then } \Delta W = \frac{1}{2} \frac{pq}{\varepsilon} = \frac{1}{2} \frac{pq}{\frac{p}{p-c}} = q(p-c) / 2 = \frac{\pi}{2}$$

1) Assume advertising comes out of monopoly profits. Then total profits are recorded profits plus advertising expenses $\pi + A$.

Adjusting monopoly profits upwards by the amount of advertising expenditure gives a higher social cost of monopoly:

$$\Delta W = \frac{\pi + A}{2}$$

3) Assume all advertising is socially wasteful: They add advertising to the social costs of advertising

$$\Delta W = A + \frac{\pi + A}{2}$$

4) Assume firms spend resources securing and maintaining monopoly positions. Assume (following Posner (1975)) that there is competition between firms to acquire the monopoly position and that this makes firms spend an amount equal to profits on socially wasteful expenses. Then welfare loss becomes:

$$\Delta W = \pi' + A + \frac{\pi + A}{2}$$

where π' is post tax profits and π is pre-tax profits.

5) Aggregation: The procedure is carried out separately for each firm.
 6) Measurement of monopoly profits: Instead of assuming that average profits give the competitive return they separately calculate a competitive rate of return above which π is measured.
 DATA: UK as well as US

Monopoly 19

Results as a % of GNP

C-M measure	UK		US	
	CM	H	CM	H
$\Pi/2$	3.86	0.21	3.96	0.40
$(\Pi+A)/2$	4.36	0.24	6.52	0.79
$A+(\Pi+A)/2$	5.39	1.19	12.27	6.52
$\Pi'+A+(\Pi+A)/2$	7.20	3.05	13.14	7.39

Monopoly 20

Conclusions on Welfare Loss from Monopoly

- Measuring social loss from monopoly is an interesting exercise
- Any conclusions depend on assumptions made
- Are any of these numbers significant?

Monopoly 21

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Monopoly 22

Numbers and Percentages

- UK-2000
 - GDP=£934 billion
 - Population=59.5 million
- Welfare loss from monopoly using Harberger's estimate:
 - $.0021 * £934 \text{ billion} = £1.96 \text{ billion}$ or
 - £32 /person
- Using Cowling and Mueller's worst-case estimate
 - $.072 * £934 \text{ billion} = £67.25 \text{ billion}$ or £1130/ person

Monopoly 23

Numbers and Percentages

- US-2000
 - Nominal GDP=\$9,963 billion
 - Population=275.6 million
- Welfare loss from monopoly using Harberger's estimate:
 - $.004 * \$9,963 \text{ billion} = \39.85 billion or
 - \$144 /person
- Using Cowling and Mueller's worst-case estimate
 - $.1314 * \$9,963 \text{ billion} = \$1,309.14 \text{ billion}$ or \$4750/ person

Monopoly 24

Reading if you are interested

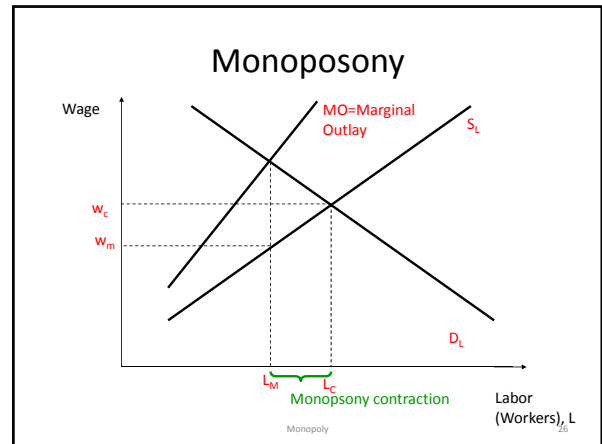
Journal of Economic Perspectives
Vol. 17, No. 4, Fall 2003

Does Antitrust Policy Improve Consumer Welfare? Assessing the Evidence
Robert W. Crandall and Clifford Winston

The Case for Antitrust Enforcement
Jonathan B. Baker

Monopoly

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David Card and Alan Krueger,
"Minimum Wages and Employment:
A Case Study of the Fast-Food
Industry in New Jersey and
Pennsylvania," *American Economic
Review*, Sept. 1994, pp. 772-793
(JStor)

Monopoly

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Conclusion

- Understanding monopoly
- Measuring monopolistic inefficiencies
- Monoposony and a possible application

Monopoly

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