

McPeak  
Lecture 11  
PPA 723

Monopsony.

There is only a single buyer in a market, and this single buyer chooses the price quantity pair from the supply curve.

It buys at a price below what the price would be in a competitive market.

Supply curve is of the input, the demand curve is the demand of the monopsonist.

Without getting into the details, it is conceptually similar to the monopoly case, though the focus is on the supply curve / marginal expenditure curve rather than the demand curve / marginal revenue curve.

Know there is a conceptual distinction.

Strategic interactions and Game theory.

Game theory is a tool to understand why outcomes with higher payoffs may not be possible to obtain if each individual acts in his or her own best interest.

How we understand why a failure to coordinate actions when there are strategic actions leads us to an outcome that does not maximize welfare of the decision makers.

A set of strategies is a Nash equilibrium if, holding the strategies of all other players constant, no player can obtain a higher payoff by choosing a different strategy.

Each firm is playing a best response strategy.

Chicken game.

Best response strategy lists out the options.

If LFG swerve, KB straight.

If LFG straight, KB swerve.

If KB swerve, LFG straight.

If KB straight, LFG swerve.

Neither option is dominant as a pure strategy.

Prisoner's dilemma.

Both quiet, lesser charge.

One squeals, gets let off, gives evidence on other so that they face a higher charge.

Both squeal, medium charge.

If I squeal, you squealing is BR.

If I am quiet, you squealing is BR.

If you squeal, me squealing is BR.

If you are quiet, me squealing is BR.

Say it is a question of entering a market.

Ford / GM example

If GM enter, F enter.

If GM plays not enter, F enter.

If F enter, GM don't enter.

If F plays not enter, GM enter.

Ford enters, GM does not.

Say it is the choice of a level of quantity to provide.

UA AA example.

If UA chooses 64, AA chooses 64.

If UA chooses 48, AA chooses 64.

If AA chooses 64, UA chooses 64.

If AA chooses 48, UA chooses 64.

If they could coordinate, then they could offer a lower quantity and earn higher profits.

Note collusion on supply and demand graph.

Detection as a preventative means.

Inspection of each other's books.

Price matching ex post.

Tracers in products.

Types of oligopoly solutions:

- 1) Cournot quantity setting oligopoly. Each firm chooses output level as a best response to the other firms' strategies.
- 2) Stackelberg quantity setting oligopoly. One firm has first mover status in a quantity setting game.
- 3) Bertrand price setting oligopoly. Each firm selects price as a best response to the other firms' strategy.

## Math appendix to contrast market structure:

$$p = 339 - q$$

$$c = 147 \cdot q, \Rightarrow MC = 147$$

If the market is **perfectly competitive**:

Supply equals demand.  $q = \sum q_i$ , where  $i$  is each individual firm.

$$339 - q = 147 \Rightarrow q = 192, p = 147.$$

$$\Pi = 192 \cdot 147 - 192 \cdot 147 = 0$$

$$CS = 18,432 : PS = 0 : TW = 18,432$$

**If we have Cournot** oligopoly competition (say 2 firms)

$$p = 339 - q_1 - q_2$$

$$\Pi_1 = (339 - q_1 - q_2) \cdot q_1 - 147 \cdot q_1$$

$$R = 339q_1 - q_1^2 - q_1q_2$$

$$MR = 339 - 2q_1 - q_2$$

$$MC = 147$$

$$MR = MC \text{ implies } 339 - 2q_1 - q_2 = 147, \text{ or } q_1 = 96 - .5q_2$$

If firms are symmetric,  $q_1 = 96 - .5(96 - .5q_1)$ , or  $q_1 = 96 - .5(96 - .5q_1)$ ,  
or  $q_1 = 96 - 48 + .25q_1$ , or  $.75q_1 = 48$ , or  $q_1 = 64$ .

Both produce this level, so total quantity is  $64 + 64$ , or 128. This implies price is 211.

Profit for each firm is thus  $211 \cdot 64 - 147 \cdot 64$ , or  $13504 - 9408$ , or 4096.

CS can be calculated as 8192, PS is 8192, total welfare is 16384.

**If Stackelberg** (give firm 1 first mover status).

$$p = 339 - q_1 - q_2$$

$$\Pi_1 = (339 - q_1 - q_2) \cdot q_1 - 147 \cdot q_1$$

Firm one knows firm two is reacting to one's decisions by  $q_2 = 96 - .5q_1$

So plug this in:

$$R = 339q_1 - q_1^2 - q_1(96 - .5q_1), = 243q_1 - q_1^2 - 96q_1 + .5q_1^2 = 243q_1 - .5q_1^2$$

$$MR = 243 - q_1$$

$$MC = 147, \text{ so if } MR = MC, q_1 = 96. \text{ This then implies that } q_2 = 96 - .5(96), \text{ or } 48.$$

Profit for firm one is 4,608, profit for firm two is 2304, total of 6912. CS = 10,368.

Total welfare is 17,280.

**If a monopoly,**

Bisection rule gives us  $MR=339-2*q$ , and  $MC = 147$ .

Monopoly  $q = 96$ , Monopoly  $p = 243$ .

Profit is 9216,

CS=4464

Total welfare is 13,680

General rule:

Welfare and quantity are highest in perfectly competitive market, lowest in monopoly.

Oligopoly of different forms lies in between.

	Q	P
Monopoly	96	243
Cournot	128	211
Stackelberg	144	195
Perfect Competition	192	147