

## Analysis of Monopsony

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### Introduction:

In a previous set of notes we looked at market power of a seller; in particular, we examined monopoly—a market with a single seller. Let's now discuss a lesser known market situation, in which the buyer has market power—*monopsony*, a market with a single buyer.

### General comments: Utility-maximizing buyers

In earlier notes, we discussed the idea that the consumer, when deciding whether to purchase one more unit of a product, must compare the marginal benefit of the product against its costs. We will look at this same utility-maximizing choice from a different angle, discussing marginal value and marginal expenditure.

### Marginal value

*Marginal value* (MV) is the dollar value of the increase in utility gained by purchasing one more unit of a product.

*Marginal value and the demand curve:* One can almost always use the demand curve as the marginal value curve. The demand curve tells us the maximum price willing to be paid for each unit produced; logic tells us that a buyer would only be willing to pay that price—sacrificing her hard-earned income—if the product gives her at least as much value as the income that she gave up.

The market demand curve is (almost always) the marginal value curve. It represents the benefit to buyers of purchasing additional units of product

### Marginal Expenditure

*Marginal expenditure* is the increase in the buyer's expenditure resulting from a purchase of one more unit of a product.

Utility-maximizing rule restated: A buyer should continue to buy units of a product as long as the marginal value exceeds the marginal expenditure.

Let's now look at how utility-maximizing consumers act, comparing two situations—one where there's zillions of buyers and one where there's only 1 buyer.

## PERFECTLY COMPETITIVE MARKET AND MONOPSONY COMPARED

Perhaps the best way to understand a market in which a monopsony exists is to compare it to a market with zillions of buyers—a competitive market. We have examined a competitive market in previous sets of notes. Let’s recall that examination, and add to it our new terminology, marginal value and marginal expenditure.

Expenditure in a competitive market:

In a competitive market there are zillions of buyers. Each buyer is so small relative to the entire market that a single buyer can buy as much as she wants without affecting the market price of the product. (Here’s an intuitive example: Consider the market for Microsoft stock, of which 20 million shares are bought daily. I, Mike, cannot affect the price per share of Microsoft stock, since at most I might buy 1,000 or so shares in a day.) Let’s look at a hypothetical example in a competitive market with a product price of \$4 per unit.

(When examining the table below, remember that marginal expenditure measures the INCREASE in the buyer’s total expenditure when she buys 1 more unit of the product.)

Competitive Market: One buyer (among zillions)

Quantity bought	Price paid per unit	Total expenditure	Marginal expenditure	Average expenditure (= total / Q)
0	\$4	\$0	na	n.a
1	\$4	\$4	\$4	\$4
2	\$4	\$8	\$4	\$4
3	\$4	\$12	\$4	\$4

Note: In a competitive market with zillions of buyers, the marginal expenditure = the price!!!

Let’s recap what we’ve learned so far:

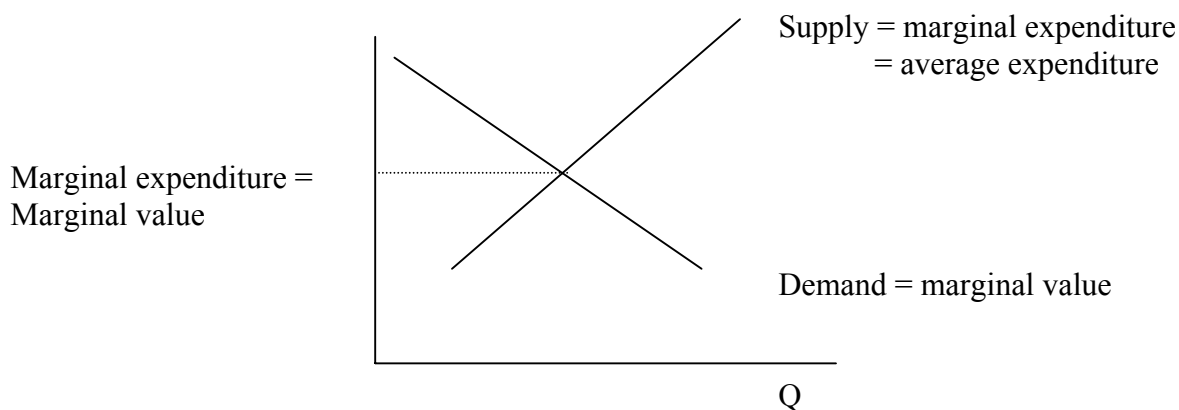
- the market demand curve is the marginal value curve
- in a competitive market, price = marginal expenditure
- buyers continue to purchase items as long as marginal value exceeds marginal expenditure

In addition, note that in a competitive market, the supply curve illustrates the price charged by sellers. This means that, since marginal expenditure = price in a competitive market

→in a competitive market, the supply curve is the marginal expenditure curve!!

Noting the above “→” information, we can graph equilibrium in a competitive market below. (This is the same graph that we’ve always used for a competitive market, but we’ve added our new terminology to it.)

A competitive market



This ends our recap of a competitive market, with the new terminology added to it. Now, let's get to the heart of the matter, a monopsony—a market with 1 buyer instead of zillions.

Expenditure in a monopsony:

In a monopsony there is only 1 buyer in the market. The buyer is so large that she must increase the price that she is willing to pay if she wishes to buy more of a product. (Here's an intuitive example: Consider the market for ACE check-cashing stores stock, of which often only a few hundred shares are bought daily. I, Mike, must increase the price per share that I am willing to pay if I wish to buy more stock, to induce sellers to sell more to me.) Let's look at a hypothetical example in a monopsony.

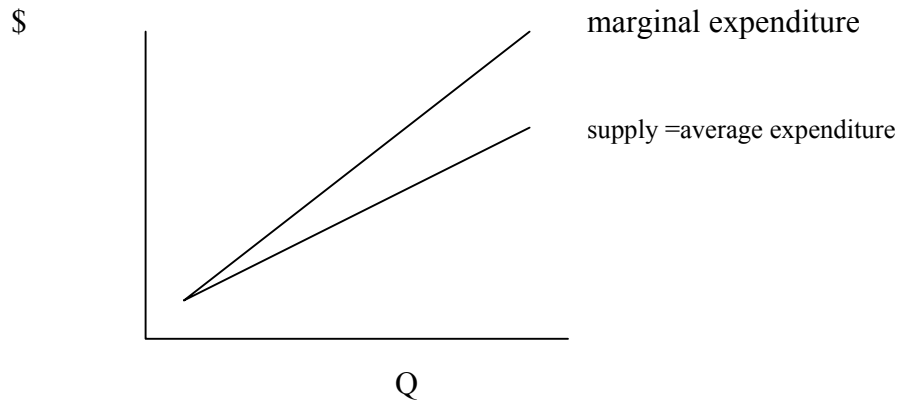
(When examining the table below, remember that marginal expenditure measure the INCREASE in the buyer's total expenditure when she buys 1 more unit of the product.)

Monopsony: One buyer (all alone and large)

Quantity bought	Price paid per unit	Total expenditure	Marginal expenditure	Average expenditure (= total / Q)
0	\$4	\$0	na	na
1	\$5	\$5	\$5	\$5
2	\$6	\$12	\$7	\$6
3	\$7	\$21	\$9	\$7
4	\$8	\$32	\$11	\$8

Note: In a monopsony, the marginal expenditure exceeds the price!!! Observe:

Monopsony: average and marginal expenditure

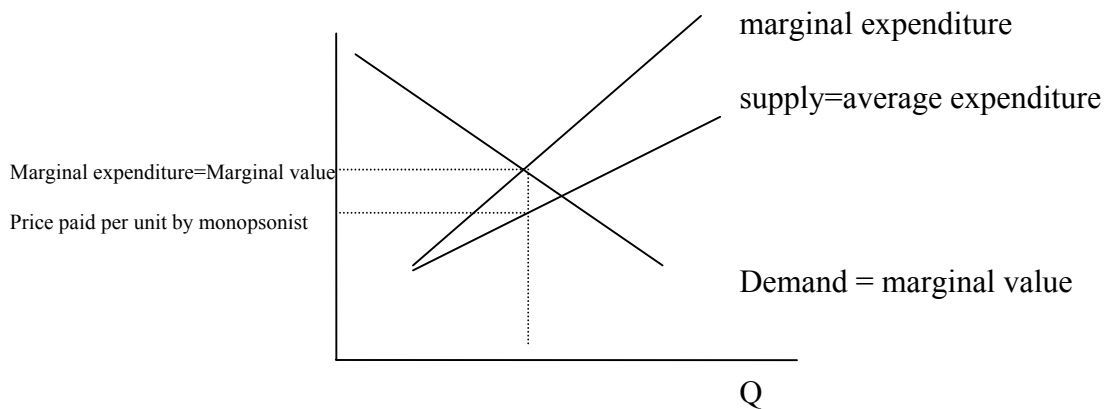


Let's recap what we've learned so far:

- the market demand curve is the marginal value curve
- in a monopsony, price (average expenditure) < marginal expenditure
- buyers continue to purchase items as long as marginal value exceeds marginal expenditure

Noting the above “→” information, we can graph equilibrium in a monopsony below.

A monopsony



Now, let's compare the outcome in a competitive market to the outcome in a monopsony.

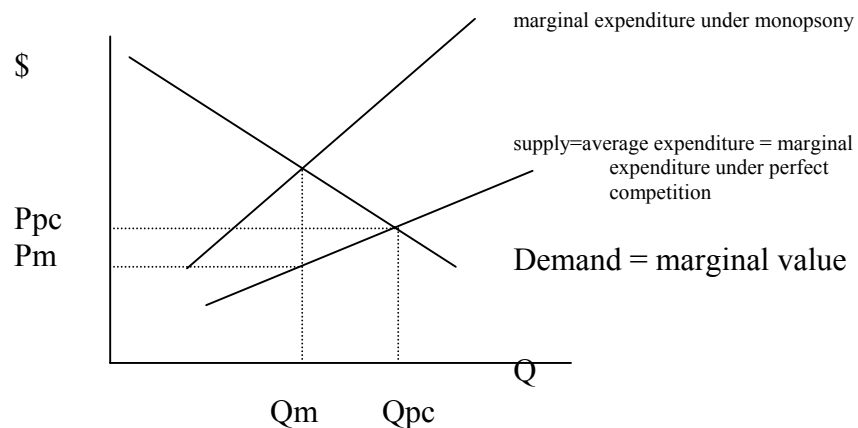
## MONOSPONY VS. PERFECTLY COMPETITIVE OUTCOME

Recall that under competition equilibrium occurs where demand = average expenditure. Under monopsony, marginal expenditure is above average expenditure, so:

Equilibrium under monopsony occurs at a lower quantity than equilibrium under perfect competition

Let's combine the information from our competitive market graph with the information from our monopsony graph, to see the difference in equilibrium quantities:

Monopsony and perfect competition compared  
( $Q_m$  is monopsony quantity;  $Q_{pc}$  is perfectly competitive quantity)



### Buying power of monopsony

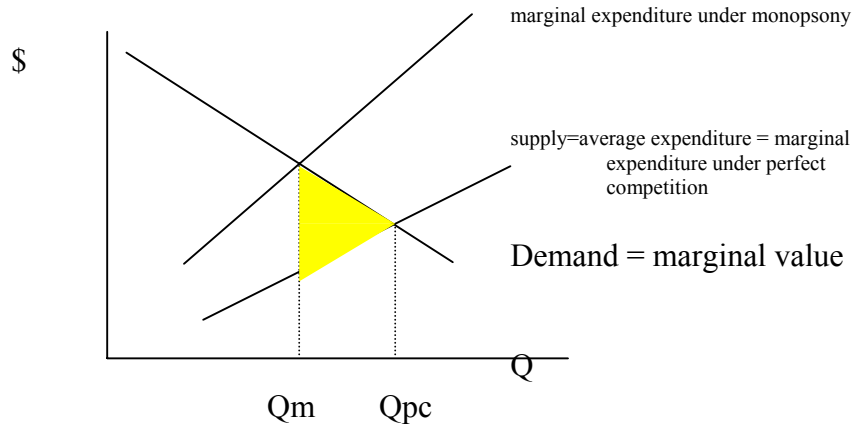
Notice, also, from the above graph, the a single large buyer—a monopsonist--pays a lower price than if there were zillions of buyers. This, I hope, makes sense to you, since the large single buyer has a lot more power in the market.

## DEADWEIGHT LOSS OF MONOPSONY

Recall from previous notes that perfect competition results in the socially efficient level of  $Q$ --the level at which the marginal value of production equals the marginal cost of producing the product. Well, the monopsony quantity is too small to be socially efficient, since it is less than the perfectly competitive quantity. This means that there is a deadweight loss associated with a market in which there is a monopsony.

### Deadweight loss graphed.

The deadweight loss is the area between the portions of the demand curve and the supply (average expenditure) curve, that lies above the missed output. It is illustrated below:



#### ALGEBRAIC EXAMPLE:

Market demand is  $P = 100 - Q$

Market supply is  $P = 20 + 3Q$

Calculate:

- Equilibrium  $P, Q$  under perfect competition
- Equilibrium  $P, Q$  under monopsony
- deadweight loss under monopsony

solution:

a) to solve for  $P$ , set demand = supply

$$100 - Q = 20 + 3Q \rightarrow 80 = 4Q \rightarrow Q = 20$$

plug  $Q = 20$  into demand or supply to get  $P$

$$P = 100 - Q \rightarrow P = 100 - 20 \rightarrow P = 80$$

b) We must set demand = marginal expenditure. So we must figure out marginal expenditure.

Marginal expenditure =  $\frac{\partial \text{total expenditure}}{\partial Q}$  so let's figure out total expenditure, and then take its derivative:

Total expenditure =  $PQ$ . Substitute  $P$  from the supply curve:

$$\text{Total expenditure} = (20+3Q)Q = 20Q + 3Q^2$$

Now take derivative of total expenditure with respect to Q

$$\text{Marginal expenditure} = 20 + 6Q$$

(shortcut to find marginal expenditure!!! For a monopsony, marginal expenditure curve is twice as steep as supply curve, with same vertical intercept)

Now set demand = marginal expenditure

$$100 - Q = 20 + 6Q \rightarrow 7Q = 80 \rightarrow Q = 11.429$$

Now plug  $Q = 11.429$  into the supply curve to get the price paid by the monopsonist:

$$P = 20 + 3(11.429) \rightarrow P = 54.286$$

Note how the monopsonist pays a lower price and buys a lower quantity than would a bunch of competitive buyers.

c) We need the maximum price that the monopsonist would pay for the last unit of Q she bought,  $Q = 11.429$ . So plug in  $Q = 11.429$  into the demand curve:

$$P_{\max} = 100 - 11.429 = 88.571$$

$$\text{Deadweight loss} = .5(88.571 - 54.286)(20 - 11.429) = \$146.9283675$$