Ch. 9

Price takers – sellers who must take the market price

Price searchers – sellers who can choose a price so as to maximize profits

Defining a price taker
1. all of the firms in the market are producing an identical product
2. a large number of firms exist in the market
3. each firm supplies only a very small portion of the total amount supplied to the market
4. no barriers limit the entry or exit of firms

Output in the short-run

Question: if you are in business what is your ultimate goal? It is to make money (for the most part; let's assume that it is your ultimate goal). How do you make money? By maximizing your profits. Recall that profits are measured as total revenues (TR) minus total (economic) costs (TC). We have learned about marginal cost (MC). Marginal revenue (MR) is a similar concept. It is the change in revenue that results from an additional unit of output sold. In the short-run, price takers expand until MR = MC. In a price taker market, MR = Price (P). So a price taker would produce where the MC curve intersects with the Price line.

Price

MC

$10 _____ P = MR
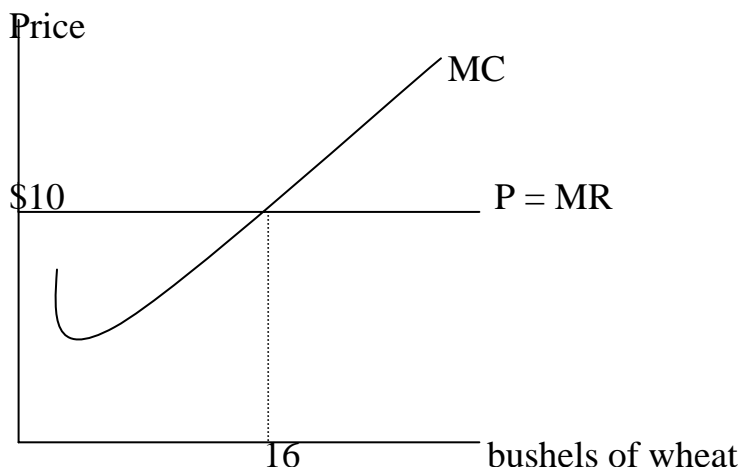
16   bushels of wheat

In this price taker market the firm will produce 16 bushels of wheat when the price is $10. Why? Because 16 is the quantity where the firm's MC curve intersects with the market price.

Profit maximization graph for a price taker

Price

ATC

MC

a
b

c
d

P=MR

0
Q*
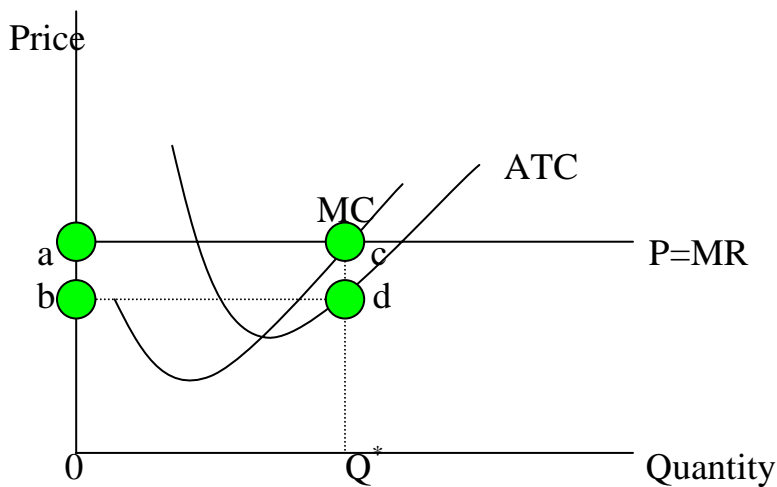
Quantity

In the above graph, MR=MC at the point c. Thus, in the short-run price
takers profit maximize at the corresponding quantity (Q*). To find out how
much profit the firm makes we also need to know where the ATC curve is
on the graph (this is usually given to students in this course). We then look
at the profit-maximizing quantity, which is Q*. We find out where Q*
crosses the ATC curve and find the corresponding price. In this graph Q*
crosses the ATC curve at point d, and the corresponding price is point b.
The profit for this firm is just Total Revenue (TR) minus Total Cost (TC).
Now, the TR of the firm is given by the price the firm charges times the
amount of the good produced (P times Q* in this example). The area on this
graph that represents TR is the rectangle ac0Q*. TC in this example is just
the ATC times the quantity produced (b times Q*). The area on this graph
that represents TC is bd0Q*. Profit then is just P times Q* minus b times
Q*. The area on this graph that represents profit is abcd.

In a similar case that I will not draw the graph for, a firm could be making
economic losses. Notice that in the above graph that ATC was below Price
at Q*. If ATC is above Price at Q*, then the firm will be running a loss.
This leads into the next section about shutdown and going out of business.

Shutdown and going out of business
Firm's have three options when they are running losses.
1. A firm will continue to produce goods **if** it can cover its variable costs in the short-run and it expects to be able to cover all of its costs in the long-run.
2. A firm will shutdown (produce zero goods) if it cannot cover its variable costs in the short-run and it expects to be able to cover all of its costs in the long-run.
3. A firm will go out of business if it does not expect to cover all of its costs in the long-run.

Why does a firm only need to cover its variable costs instead of all of its costs in the short-run? Remember that TC = VC + FC. FC represents fixed costs which the firm will incur regardless if it produces zero goods or if it produces any other amount of goods. If the firm makes any money above VC it will be able to pay for some of its FC. This is why a firm would operate in the short-run if it is running a loss.

To see how this works, if FC is $50 a firm can produce nothing and its total costs are $50, with total revenues being $0. The profit the firm is earning is negative fifty dollars (-$50). Let's say that the firm can produce 10 units of output and it faces a price of $20 per unit (this is the price they get from selling the good). The firm now has total revenue of $200. The firm still has fixed costs of $50, so now we have profit = TR – TC, where TC = VC + FC, or profit = TR – (VC + FC). TR is $200, FC is still $50 and let's suppose that VC = $190. We now have profit = $200 - $50 -$190. Thus, profit is still negative, but it is negative forty now (-$40) instead of negative fifty (-$50). Clearly, the firm is better off to make (-$40) instead of (-$50). However, remember that a firm will only operate at a loss in the short-run if it expects to make profits in the long-run. If a firm was making 8-track players 20-25 years ago, it may have been running a loss. Some of the firm's owners probably saw that cassettes would rule the market and they decided to go out of business because they did not believe that they would make profits in the future.

To see when a firm shuts down, we can use the above example. If at 10 units TR = $200, FC = $50, and VC = $ 220, the firm would then be making $200 - $50 - $220 = (-$70). Clearly, this is worse than the firm would make if it were to produce zero. (Remember that at zero a firm only faces fixed costs (-$50)). So this firm would shutdown, if it expected to make profits in the long-run.

Firm's short-run supply curve

The price taker that intends to stay in business (either produce or shutdown) will maximize profits when it produces the output level at which P=MC and variable costs are covered. Therefore, the portion of the firm's short-run marginal cost curve that lies above the AVC is the short-run supply curve of the firm. As the market price of a good increases, the firm will expand output along its MC curve (it has to expand output along the MC curve otherwise we would not have P=MC).

Short-run market supply curve

In a price taker market, the short-run market supply curve is the horizontal summation of the MC curves for all the firms.

Long-run Equilibrium

Remember that in chapter 3 we learned that for a market to be in equilibrium quantity supplied had to equal quantity demanded. In a price taker market, there is another condition that must hold. It is called the zero-profit condition. This means that all firms in the market (remember this is a **price taker market**) must earn zero economic profit. This means that:
1. P = the minimum of the ATC curve (remember that ATC is U-shaped so it means that P = the very lowest point in the U)
2. Since P = MC, this condition means that MC intersects ATC at its minimum

If economic profits are being earned then these conditions are not met. What will happen then? Firms that are not producing will see that profits are being made. They will then have an incentive to enter the market. This will increase the supply, which will lower the price of the good to the point where P = MC = minimum of the ATC.
Similarly, if economic losses are occurring, firms will exit the market. This will reduce supply and drive the market price up to the point where P = MC = minimum of ATC.

Adjusting to changes in demand

Also, from chapter 3 we learned reasons for demand changes. Pick any one
of those reasons that increased demand. Imagine we had a market that was
in equilibrium (the green dot on the graph below). If demand increases, the
entire demand curve shifts. Now the firms in the industry cannot meet the
demand so the price rises to accommodate this increase in demand (the
yellow dot on the graph below). We now have quantity supplied equals
quantity demanded. The question I ask is: Is the price taker market in
equilibrium? Not necessarily. Remember that there are two conditions for
equilibrium in a price taker market. We satisfied the quantity supplied
equals quantity demanded. But is the zero-profit condition satisfied? NO.
Because no firms have entered the market yet, the existing firms are making
economic profits. We cannot have this in a price taker market. So firms will
enter the market when an increase in demand occurs, driving the price back
down (the red dot on the graph below indicates the new market equilibrium).
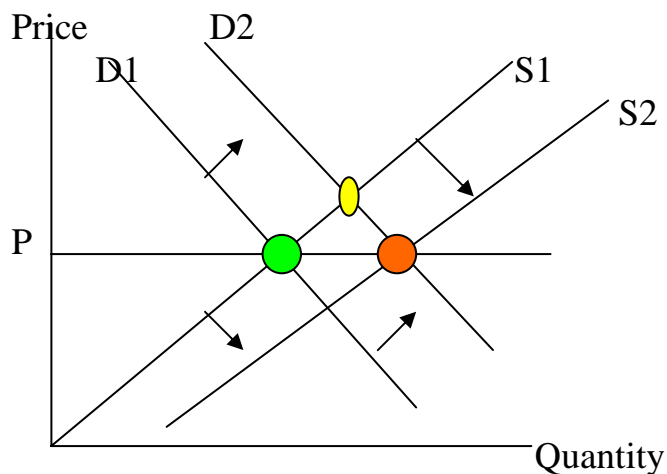
Why does the price not change from the first equilibrium (green dot) to the
second equilibrium (red dot)? Remember that this is a price taker market
and that at the market price (P), firms can supply as much of the good as
they want to. In this case the firms that already existed did not supply more,
but other firms entered to supply more.

Again a similar case could be made for a decrease in demand, only when
demand decreases firms leave the market which reduces the supply of the
good.

Long-run supply

The long- run market supply curve indicates the minimum price at which firms will supply various market output levels, given sufficient time both to adjust fixed costs and to enter or exit the industry.

There are three possible cases that cause the shape of the long-run supply curve.
1. Constant cost industry – as the market expands output, resources used to make the output stay at the same price. For example, if more and more calculators are being produced, the prices of all the goods used to make calculators (the plastic casing, the buttons, the amount you pay someone who works in the calculator factory, all the little electronic elements inside of the calculator) stay the same
2. Decreasing cost industry – as the market expands output, resources used to make the output decrease in price (this is why we call it decreasing cost industry). If more and more calculators are being produced, the prices of all the goods used to make calculators are falling.
***Do either of these make sense in most cases? If we expand output, we are increasing the demand for all the resources needed to build a good. We now need more plastic casings, more buttons, more workers (or more worker hours) and more electronic elements. What happens when we demand more of a good? Remember from chapter 3 that if demand increases then the price goes up. And if the price goes up for plastic casings, buttons, workers, and electronic elements, then the firm will be facing increasing costs. Which leads to our final case:
3. Increasing cost industry – as the market expands output, resources used to make the output increase in price. This is exactly what I described above and what happens most often in the real world.
Constant cost and Decreasing cost industries do occur, but very rarely.

Supply elasticity and the role of time

Remember that over time the demand for goods is more elastic (you can find more available substitutes in one month than you can ten minutes from now). The same is true for the supply of goods. The supply curve tends to be more elastic over time as firms can change more inputs over time. And the ability to change these inputs is what determines elasticity.

Role of profit and losses

Profit is a reward that business owners will earn if they produce a good that consumers value more than the resources required for the good's production.

Profit is the motivation behind a firm's decision to enter a market. Entry in the price taker market will reduce the price that consumers have to pay, assuring that prices will accurately reflect the costs of production.

Losses are a penalty for firms that inefficiently use resources. If firms are making losses, then those resources must have a higher demand in some other industry and the economy would be better served if those resources were shifted to that industry.