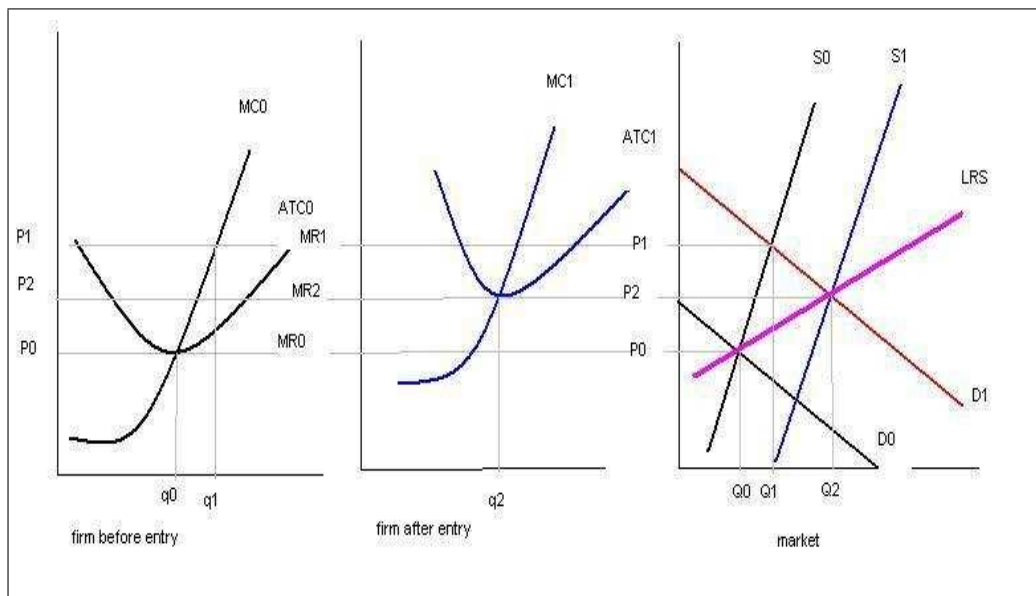


# Perfectly Competitive Markets Continued

March 30, 2004

**Increasing Cost Case** Suppose supply is  $S_0$  and demand is  $D_0$ . This results in price  $p_0$  and the profit-maximizing firm is producing  $q_0$  and earning zero profits. Suppose demand increases. This causes price and thus  $MR$  to increase. The firm is now producing at  $q_1$  and producing positive profits. Other firms decide to enter. This is seen as a rightward shift of the short run supply curve, from  $S_0$  to  $S_1$ . Because of increasing costs, as firms enter, it causes the input prices of current firms to increase. This is seen in the second graph, where both  $ATC$  and  $MC$  have increased. (We know the entry process will continue until profits equal zero. I have drawn the second graph to reflect the point at which no more firms would enter.) This firm produces  $q_2$  and market output is  $Q_2$ . The long run supply curve shows all points at which firms are earning zero profits; therefore, we can draw a long run supply curve through the two zero profit points.

Figure 1: Increasing Cost Industry



**Decreasing Cost Case** This is the opposite case from increasing cost.

**Example 1** *Draw the above graphs for the decreasing cost case.*

Newly emerging or infant industries are believed to have negatively sloped long-run supply curves. The basic idea is that when an industry is just emerging, many inputs, such as workers with specific training or specific electronics, are difficult to get and thus expensive. Consider something like nanotechnology now or biotechnology or internet companies in the past. Nanotechnology is an emerging field. It is unlikely that recent college graduates have the knowledge to do nanotechnology. Only specialists do. Over time, as the field grows, more training in this field will be available in college. As the size of the industry grows, it will be more profitable to produce the specialized inputs required, which will reduce the costs of these inputs for the industry. Infant industries are often a part of trade discussions. The idea is that if infant industries are protected from outside competition, they will be able to produce at lower costs over time and be more competitive. It must be noted that this label is often claimed by many industries who should have grown up a long time ago.

## 1 Market Efficiency

**Definition 2** *Consumer Surplus (CS): extra value consumers receive from consuming a good over what they pay for it (WTP-price for units bought).*

Recall that WTP is shown by the demand curve. Therefore, CS is the top triangle. CS can be thought of as consumers' gains from market transactions.

**Definition 3** *Producer Surplus (PS): difference between the amount for which a good sells and the minimum required in order for the firm to produce the good ( $P$ -WTA for units sold)*

Figure 2: Consumer Surplus

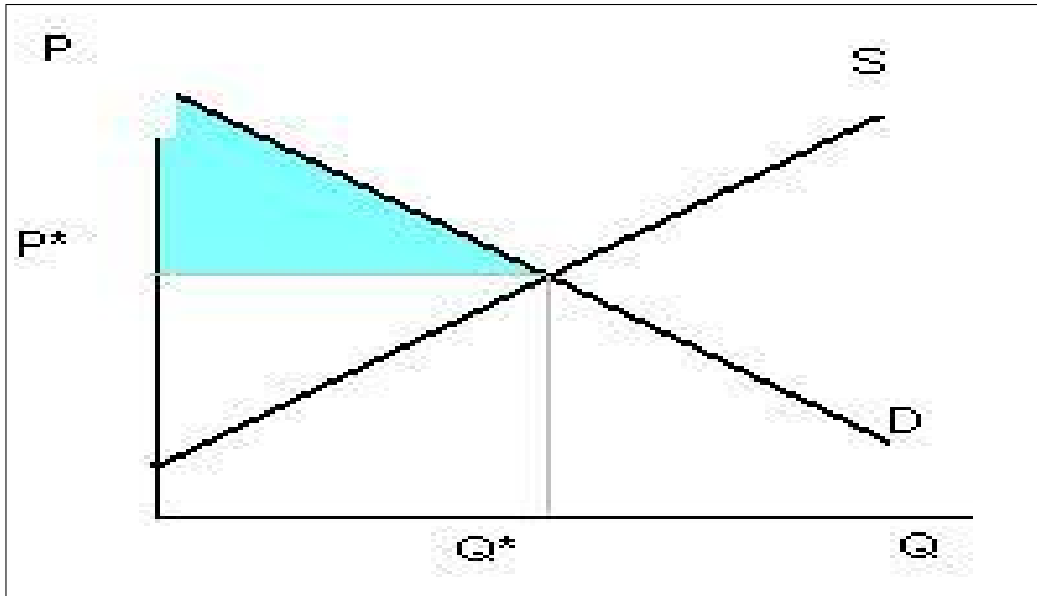
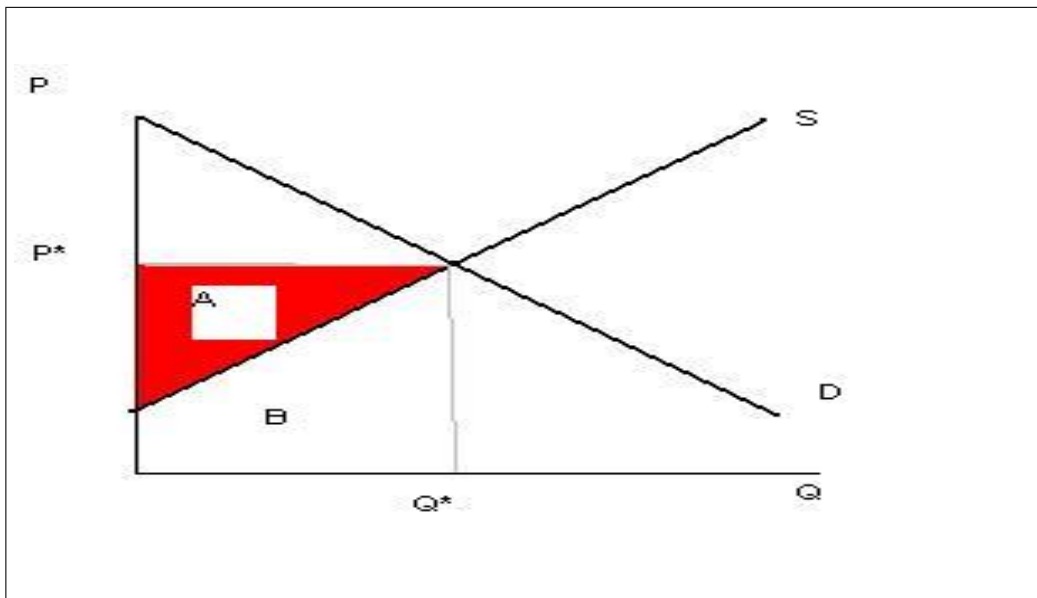


Figure 3: Producer Surplus



Recall that  $WTA$  is shown by the supply curve. Therefore,  $PS$  is the bottom triangle. How to interpret  $PS$ ? This depends on whether we're considering the short run or the long run. Let's first consider the short run. In this case, we know that the short run supply is just the sum of firms

individual supply curves, which are just the  $MC \geq \min AVC$ . Given this, the area under the  $MC$  curve (area B) is  $VC$  (sum of the extra cost of producing each additional unit). Area A+B is revenue ( $P*Q$ ). Therefore, since producer surplus is A,

$$PS = Rev - VC.$$

Recall,

$$\begin{aligned} \pi &= Rev - VC - FC \\ \pi + FC &= Rev - VC. \end{aligned}$$

So  $PS = \pi + FC$ . PS includes profits and fixed costs in the short run.

In the long run, there are no fixed costs. So  $PS = \pi$ . Given the material we studied before, where all firms had identical costs, this would imply zero profits and thus no producer surplus. However, if one allows firms to have different costs then it is possible for some firms to earn positive profits in the long run. Consider the example presented by David Ricardo. There are many parcels of land on which tomatoes can be grown. Some parcels are better than others for producing tomatoes. When the price of tomatoes is low, only the best (low cost) farms are used. As the price rises, higher cost farms are brought into production. (Same idea for oil.) The long run supply curve will be positively sloped to reflect the higher input prices for higher levels of production.

The graph below shows that when the marginal farm is earning zero profits, the medium and low cost farms are earning positive profits. Free entry can't erode these returns to the low cost land. These long run profits are sometimes called **Ricardian rents**. Note, however, that one would expect a farmer who rented this land for example to pay this money back in rents to the actual owner of the land. Similarly, if the low cost land was to go up for sale, one would expect the land to go for a higher price than other pieces of land, thus eroding these rents.

Figure 4: Producer Surplus

