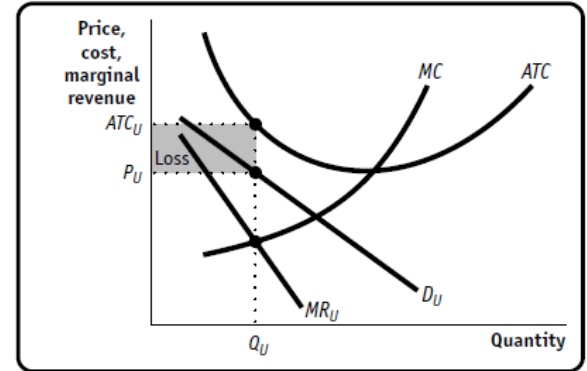


Monopolistic Competition

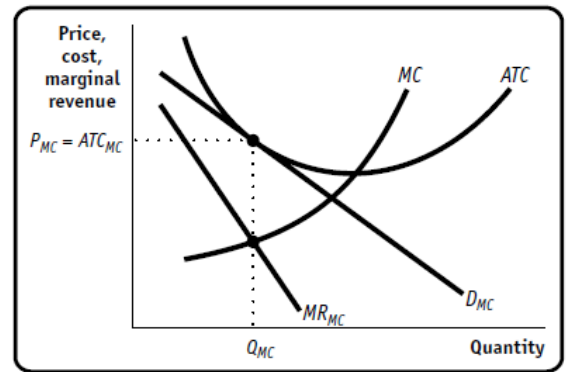
Problem Set

1. The market structure of the local gas station industry is monopolistic competition. Suppose that currently each gas station incurs a loss. Draw a diagram for a typical gas station to show this short-run situation. Then, in a separate diagram, show what will happen to the typical gas station in the long run. Explain your reasoning.

Each gas station will produce the output, and so charge the price, that maximizes its profit or minimizes its loss. That is, it will produce quantity Q_U , where marginal cost equals marginal revenue, and so charge price P_U . Since the price P_U is lower than average total cost at the quantity Q_U , ATC_U , each gas station incurs a loss. That is, the situation for the typical gas station looks like the accompanying diagram.



Since gas stations are incurring losses, in the long run some will exit the industry. This shifts the demand and marginal revenue curves for each of the remaining gas stations rightward. Exit continues until each remaining gas station makes zero profit. This is the long-run equilibrium. The situation for the typical gas station in this equilibrium is illustrated in the accompanying diagram. Demand has increased to the level at which this gas station makes zero profit at a price of P_{MC} and a quantity of Q_{MC} .

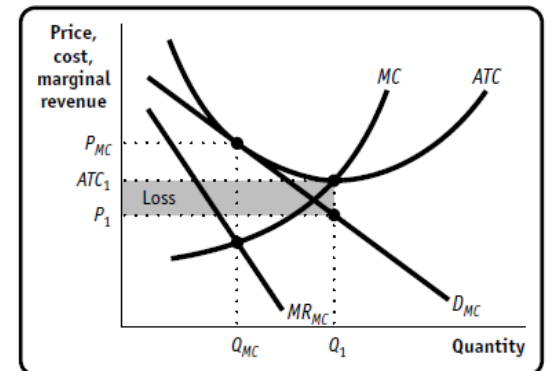


2. The restaurant business in town ins a monopolistically competitive industry in long-run equilibrium. One restaurant owner asks for your advice. She tells you that, each night, not all tables in her restaurant are full. She also tells you that if she lowered the prices on her menu, she would attract more customers and that doing so would lower her average total cost. Should she lower her prices? Draw a diagram showing the demand curve, marginal revenue curve, marginal cost curve, and average total cost curve for this restaurant to explain your advice. Show in your diagram what would happen to the restaurant owner's profit if she were to lower the price so that she sells the minimum-cost output.

She should not lower her price. Since the industry is in long-run equilibrium, each restaurant makes zero profit. That is, the restaurant's demand, marginal revenue, marginal cost, and average total cost curves are as shown in the accompanying diagram.

The restaurant owner produces output (the number of tables served) Q_{MC} at a price of P_{MC} . The price is equal to average total cost, so she makes zero profit. If she were to lower the price to P_1 , she would attract more customers and sell the minimum-cost output Q_1 . That is, there is excess capacity:

each restaurant in town could produce more output at a lower average total cost. But lowering the price to P_1 would cause the restaurant owner to incur a loss equal to the shaded rectangle in the diagram, since price is now below average total cost, ATC_1 . In fact, there is no price other than P_{MC} at which the restaurant owner does not make a loss. So she should not change the prices on her menu.

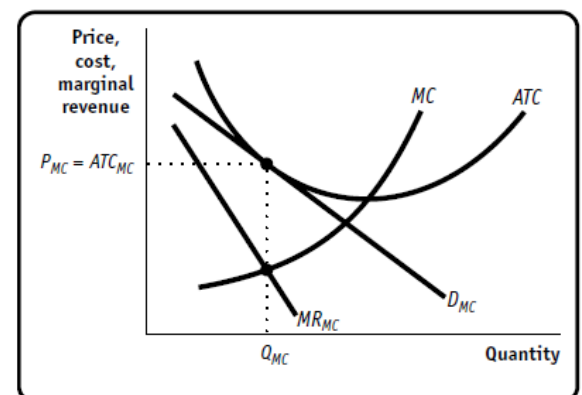
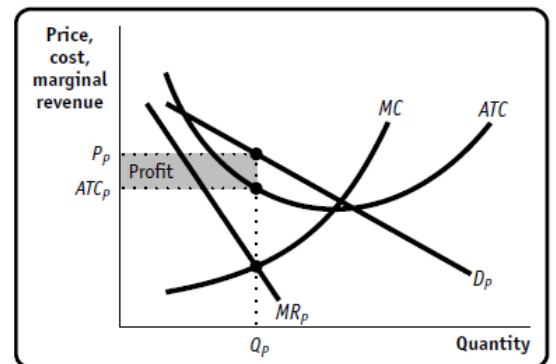


3. Currently a monopolistically competitive industry, composed of firms with U-shaped average total cost curves, is in long-run equilibrium. Describe how the industry adjusts, in both the short and long run, in each of the following situations.
 - a. A technological change that increases fixed cost for every firm in the industry. **An increase in fixed cost raises average total cost and shifts the average total cost curve upward. In the short run, firms incur losses. In the long run, some will exit the industry, resulting in a rightward shift of the demand curves for those firms that remain in the industry, since each one now serves a larger share of the market. Long-run equilibrium is reestablished when the demand curve for each remaining firm has shifted rightward to the point where it is tangent to the firm's new, higher average total cost curve. At this point each firm's price just equals its average total cost, and each firm makes zero profit.**
 - b. A technological change that decreases marginal cost for every firm in the industry. **A decrease in marginal cost lowers average total cost and shifts the average total cost curve and the marginal cost curve downward. Because existing firms now make profits, in the long run new entrants are attracted into the industry. In the long run, this results in a leftward shift of each existing firm's demand curve since each firm now has a smaller share of the market. Long-run equilibrium is reestablished when each firm's demand curve has shifted leftward to the point where it is tangent to the new, lower average total cost curve. At this point each firm's price just equals average total cost, and each firm makes zero profit.**
4. Why, in the long run, is it impossible for firms in a monopolistically competitive industry to create a monopoly by joining together to form a single firm? **If all the existing firms in the industry joined together to create a monopoly, they would achieve monopoly profits. But this would induce new firms to create new, differentiated products and then enter the industry and capture some of the monopoly profits. So in the long run it would be impossible to maintain a monopoly. The problem arises from the fact that because new firms can create new products, there is no barrier to entry that can maintain a monopoly.**
5. The local hairdresser industry has the market structure of monopolistic competition. Your hairdresser boasts that he is making a profit and that if he continues to do so, he will be able to retire in five years. Use a diagram to illustrate your hairdresser's current situation. Do you expect this to last? In a separate diagram, draw what you expect to happen in the long run. Explain your reasoning.

Your hairdresser currently makes a profit. His demand, marginal revenue, marginal cost, and average total cost curves are shown in the accompanying diagram.

Since this hairdresser (and all other hairdressers) makes a profit equal to the shaded rectangle by producing quantity Q_P at a price P_P , there will be entry into this industry. As more hairdressers open shops in town, demand for the typical existing hairdresser will fall—the demand curve and marginal revenue curve shift leftward. This will continue to the point at which no hairdresser makes positive profit. This eliminates the incentive for further entry into the industry, and long-run equilibrium is reached. The situation is illustrated in the accompanying diagram.

The best the typical hairdresser can do is to produce quantity Q_{MC} at a price of P_{MC} . Since price equals average total cost at this quantity, each hairdresser will make exactly zero profit.



6. The market for peanut butter in Nutville is monopolistically competitive and in long-run equilibrium. One day, consumer advocate Skippy Jif discovers that all brands of peanut butter in Nutville are identical. Thereafter, the market becomes perfectly competitive and again reaches its long-run equilibrium. Using an appropriate diagram, explain whether each of the following variables increases, decreases, or stays the same for a typical firm in the market.

- Price. **The price will fall from P_{MC} to the minimum average total cost (P_C) when the market becomes perfectly competitive.**
- Quantity. **The quantity produced by a typical firm will rise to Q_C which is at the efficient scale of output.**
- Average total cost. **Average total cost will fall as the firm increases its output to the efficient scale.**
- Marginal cost. **Marginal cost will rise as output rises. Marginal cost is now equal to price.**
- Profit. **Profit will not change. In either case, the market will move to long-run equilibrium where all firms will earn zero economic profit.**

