Chapter 4 Update

Kenneth A. Reinert, *An Introduction to International Economics: New Perspectives on the World Economy*, Cambridge University Press, 2012.

Appendix: Intra-Industry Trade under Monopolistic Competition

There is a more advanced approach to intra-industry trade based on imperfect competition that has become a standard part of what is known as "new trade theory."[1] The particular type of imperfect competition used in this approach is *monopolistic competition*.[2] The term "monopolistic competition" is a funny one. How can a monopoly be competitive? The term refers to the fact that the model borrows one feature from monopoly and another from perfect competition.

The monopoly feature is that the monopolistically competitive firm faces a downward-sloping demand curve. This is due to a fact very relevant to the intra-industry trade phenomenon: the monopolistically competitive firm produces a *differentiated good*. The good is differentiated in the sense that it is slightly different from those of other firms in the industry/sector, and this is true of all the firms in the sector. The competition feature is that there is free entry and exit of firms from the sector in the long run. Therefore, there can be no long-run economic profits.

There is also a third element that is part of the monopolistic competition, intra-industry trade model. This is *economies of scale*. Under economies of scale, average costs fall as a firm's output increases. To understand the model, we need to combine the three elements of product differentiation, free entry and exit, and declining average costs.[3] We will begin with economies of scale and declining average costs.

Figure 4.6 shows the relationship between a firm's average costs (AC), marginal costs (MC) and quantity of output (q). This figure shows an AC graph that is falling due to economies of scale. From what we know about the relationship between averages and marginals, if an average is falling, the marginal must be below it.[4] That is the case in the figure, and for simplicity, we assume that the MC curve is constant.

The AC and MC graphs in Figure 4.6 describe the cost side of the monopolistically competitive firm. What we need to add is the revenue side. The centerpiece of the revenue side is the firms demand curve (d). We need to draw this as relatively elastic (flat) because there are a

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[1] For a review of new trade theory, see Krugman (1999) and Matschke (2009).

[2] This model goes back to the work of Chamberlin (1933). The application to intra-industry trade was made by Krugman (1980).

[3] Krugman (1999) wrote: "To understand the revolution, you need to grasp two related dichotomies. One is that between constant and increasing returns; the other between perfect and imperfect competition."

[4] Imagine that you have a grade point average (GPA) of 3.0. You take on additional (marginal) course and score a 2.0. What will happen to your GPA? It will fall, but (fortunately) not all the way to 2.0.

significant number of close substitutes for the good that the firm produces. Associated with the demand curve is a steeper marginal revenue (MR) curve. It is steeper than the demand curve because whenever the firm increases its output, the price (P) falls. These two graphs are presented in Figure 4.7.

Figure 4.6. Economies of Scale
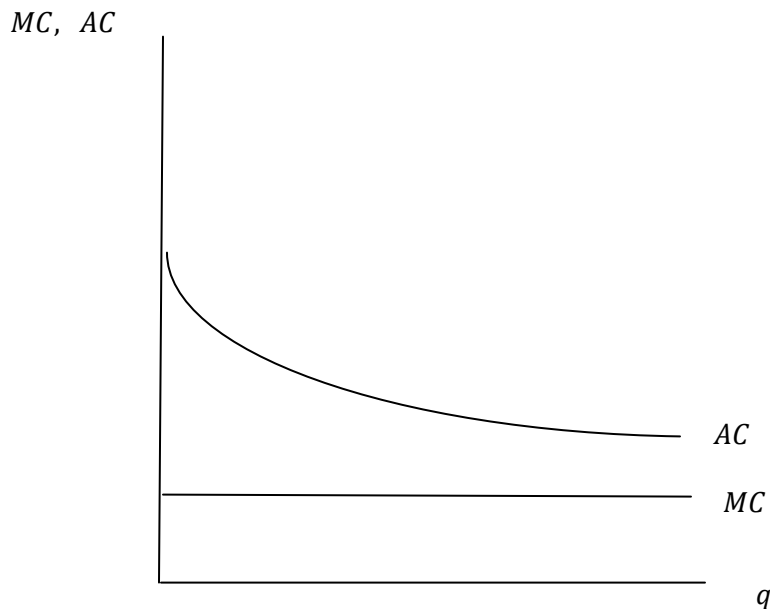
Our next task is to put together the cost side of the firm (Figure 4.6) and the revenue side of the firm (Figure 4.7). We do this is Figure 4.8. We want to do this to illustrate long-run equilibrium in the monopolistically competitive sector/industry. This involves two things. First, firms must be maximizing profits. Recall from your introductory microeconomics course that this implies that they choose output where marginal revenue equals marginal cost ($MR = MC$). Second, long run entry and exit of firms ensures that economic profits are zero or that price equals average costs ($P = AC$). These two conditions are represented in Figure 4.8. They determine the price and quantity of the monopolistically competitive firm. Because we have not yet introduced international trade, we will refer to these as the autarky price (P^A) and the autarky quantity (q^A).

We next need to introduce international trade into the model. The main effect of trade is to expand the market in which our firm is competing. The number of firms operating abroad is added to the number of firms operating domestically, so our particular firm is competing with a

larger set of differentiated products. This means that trade increases the price elasticity of demand for the individual firm. Consequently, the demand curve becomes flatter.


Figure 4.7. Demand and Marginal Revenue
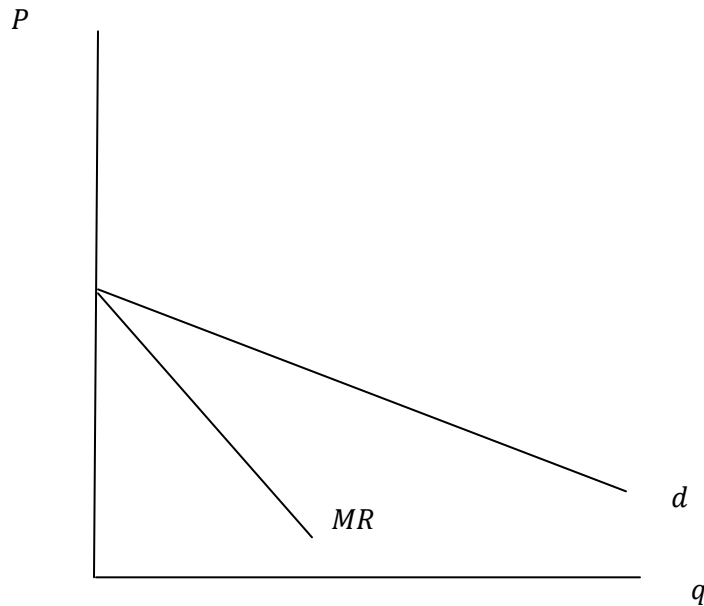
The consequences of trade, including the flatter demand curve, are presented in Figure 4.9. The flatter demand curve that trade brings carries along with it a flatter MR curve. These revenue-side effects increase the individual firm's profit-maximizing output from q^A to q^T. The new and higher profit-maximizing level of output also involves a fall in the price from P^A to P^T. This price fall takes place for all firms remaining in the sector. The fact that all remaining firms have lowered their price is the result of increased competitive pressure from this incentive to lower prices. In fact, this increased competitive pressure involves some firms *exiting* from the sector in the transition to the new, long-run equilibrium illustrated in Figure 4.9. The number of *firms* in the sector is *lower* as a result of trade, but the number of available *varieties* is *higher* as a result of trade, with more varieties being available from abroad.
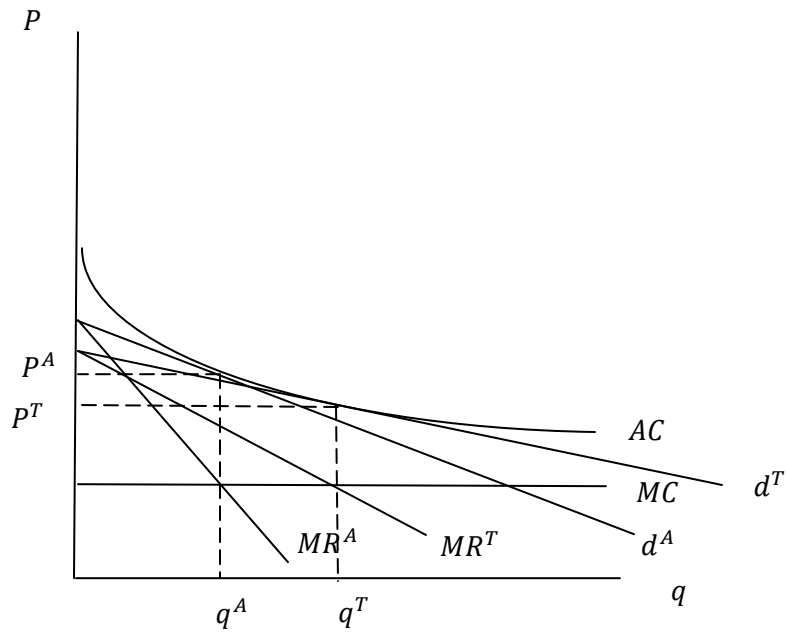
Figure 4.8. Equilibrium under Monopolistic Competition
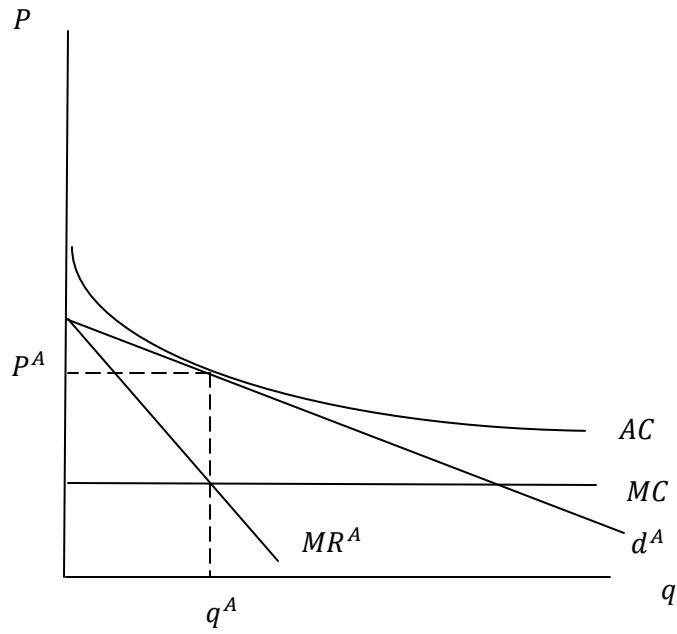
Figure 4.9. The Effects of International Trade

As with the cheese example illustrated previously in this chapter, the gains from trade come from two sources. The first is the standard gains from trade due to the fact that prices are lower and quantities are higher. The second is due to the fact that households have access to a larger variety of goods, which has value in and of itself.

Additional References

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