

# ADDITIONAL TOPICS CHAPTER 17

## Gains from expanded markets

In the introduction to this chapter and in the discussion of Adam Smith's writings, we stressed the gains from trade that come from larger-sized markets. Having discussed the principle of comparative advantage, we now examine this other source of the gains from trade.

### An example of gains from trade through expanded markets

Let us start with a simple example. Consider two countries such as France and Germany that are similar in resources, capital and skilled labour. Suppose there is a market in Germany and France for two medical diagnostic products: magnetic resonance imaging (MRI) machines and ultrasound scanners. Suppose the technology for producing each type of diagnostic device is the same in each country. We assume that the technology is identical because we want to show that trade will take place without differences between the countries.

Figure 17.1 illustrates the situation. Without trade, both Germany and France produce 1000 MRIs and 1000 ultrasound scanners. This amount of production meets the demand in the two separate markets. The cost per unit of producing each MRI unit is €300 000 (300 000 euros), while the cost per unit of producing each ultrasound scanner is €200 000. Again, these costs are the same in each country.

### Effects of a larger market

Now suppose that the two countries trade. Observe in figure 17.1, and this is very important, that the *cost per unit* of producing MRIs and ultrasound scanners *declines as more are produced*. Trade increases the size of the market for each product. In this example the market is twice as large with trade than without it: 2000 MRIs rather than 1000 and 2000 ultrasound scanners rather than 1000. The production of MRIs in France can expand, while the production of ultrasound scanners in Germany can contract. Similarly, the production of ultrasound scanners in Germany can expand and the production of MRIs in Germany can contract. By specialising production of MRIs in France, the cost per unit of MRIs declines to €150 000. Similarly, the cost per unit of ultrasound scanners declines to €150 000. France exports MRIs to Germany so that the number of MRIs in Germany can be the same as without trade, and Germany exports ultrasound scanners to France. The gain from trade is the reduction in cost per unit. This gain from trade has occurred without any differences in the efficiency of production between each country.

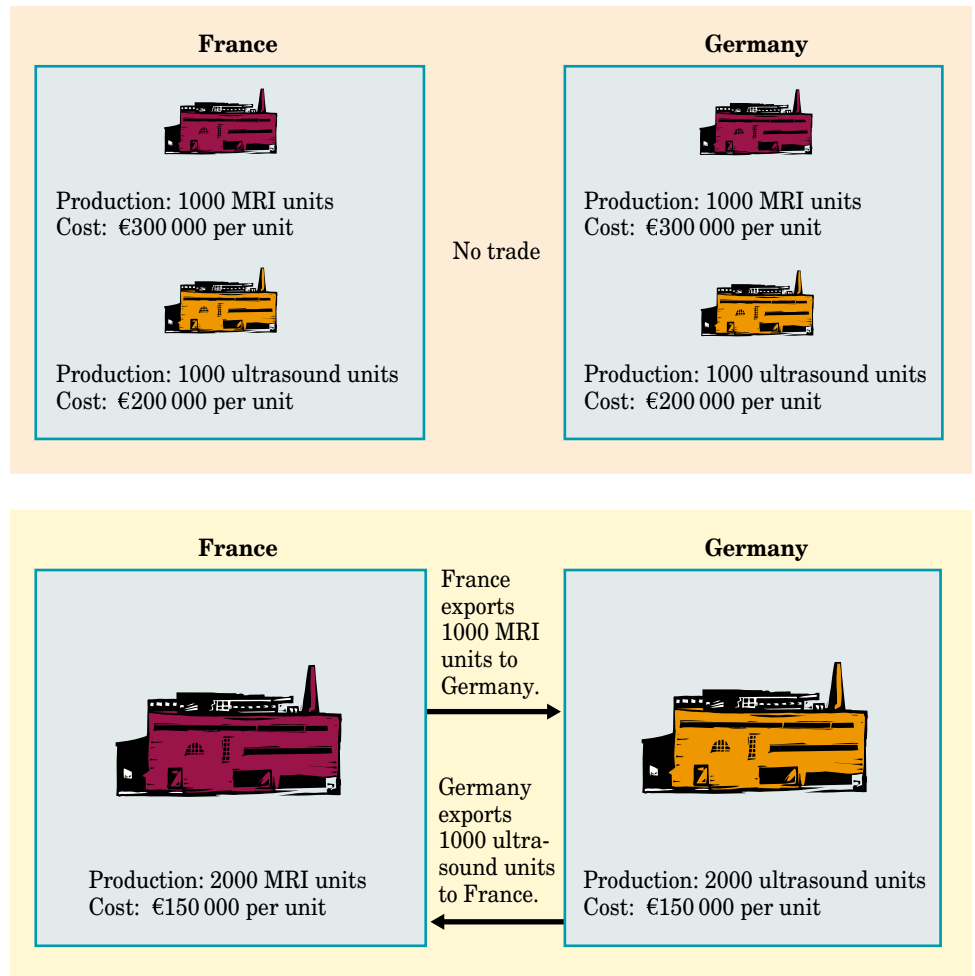
Note that we could have set up the example differently. We could have had Germany specialising in MRIs and France specialising in ultrasound scanner production. Then France would have exported ultrasound scanners and Germany would have exported MRIs. But the gains from trade would have been exactly the same. Unlike the comparative advantage motive for trade, the expanded markets motive cannot alone predict what the direction of trade will be.

**FIGURE 17.1**

**Gains from expanded markets**

In this example, the technology of producing magnetic resonance imaging (MRI) machines and ultrasound scanners is assumed to be the same in France and Germany. In the top panel, with no trade between France and Germany, the quantity produced is low in each country and the cost per unit is high.

With trade, the French firm increases its production of MRIs and exports to Germany; the German firm increases its production of ultrasound scanners and exports to France. As a result, cost per unit comes down significantly.



**Intra-industry trade versus inter-industry trade**

MRIs and ultrasound scanners are similar products; they are considered to be in the same industry, the medical diagnostic equipment industry. Thus, the trade between Germany and the France in MRIs and ultrasound scanners is called intra-industry trade, which means trade in goods in the same industry.

In contrast, the trade that took place in the example of comparative advantage was inter-industry trade, because vaccines and television sets are in different industries. In that example, the exports of vaccines from Australia greatly exceed imports of vaccines, producing an Australian industry trade surplus in vaccines. Imports of television sets into Australia are much greater than exports of television sets, producing an Australian industry trade deficit in television sets.

These examples convey an important message about international trade. Trade due to comparative advantage tends to be inter-industry and trade due to expanded markets tends to be intra-industry. In reality, a huge amount of international trade is intra-industry trade. This indicates that creating larger markets is an important motive for trade.

## Measuring the gains from expanded markets

The medical equipment example illustrates how larger markets can reduce costs. To describe the gains to trade from larger markets, we need to consider a model.

### A relationship between cost per unit and the number of firms

Let us first establish the principle exemplified in the medical equipment example: as the number of firms in a market of a given size increases, the cost per unit at each firm increases because each firm produces less. This is shown in the graph on the left of figure 17.2, where four identical firms are shown. With one firm in the market, cost per unit is \$10, but cost per unit rises to \$30 when four firms are in the market.

Next observe the situation in the graph on the right of figure 17.2. This graph represents the same four firms, but now the size of the market is larger. By comparing the graph on the left (smaller market) with the graph on the right (larger market) we see that an increase in the size of the market reduces cost per unit at each firm, holding the number of firms constant in the industry. For example, when there is one firm in the market, cost per unit is \$5 for the larger market compared with \$10 for the smaller market. Or with four firms, cost per unit is \$25 for the larger market compared with \$30 for the smaller market. Compare the little tables in figure 17.2. As the market increases in size, each firm produces at a lower cost per unit.

**FIGURE 17.2**  
Cost per unit: the number of firms and market size

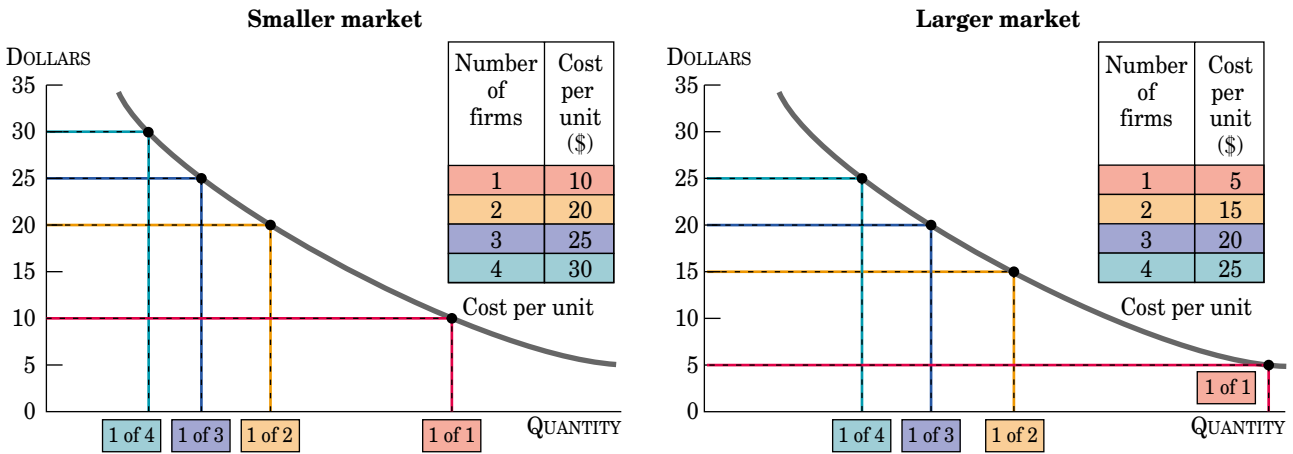
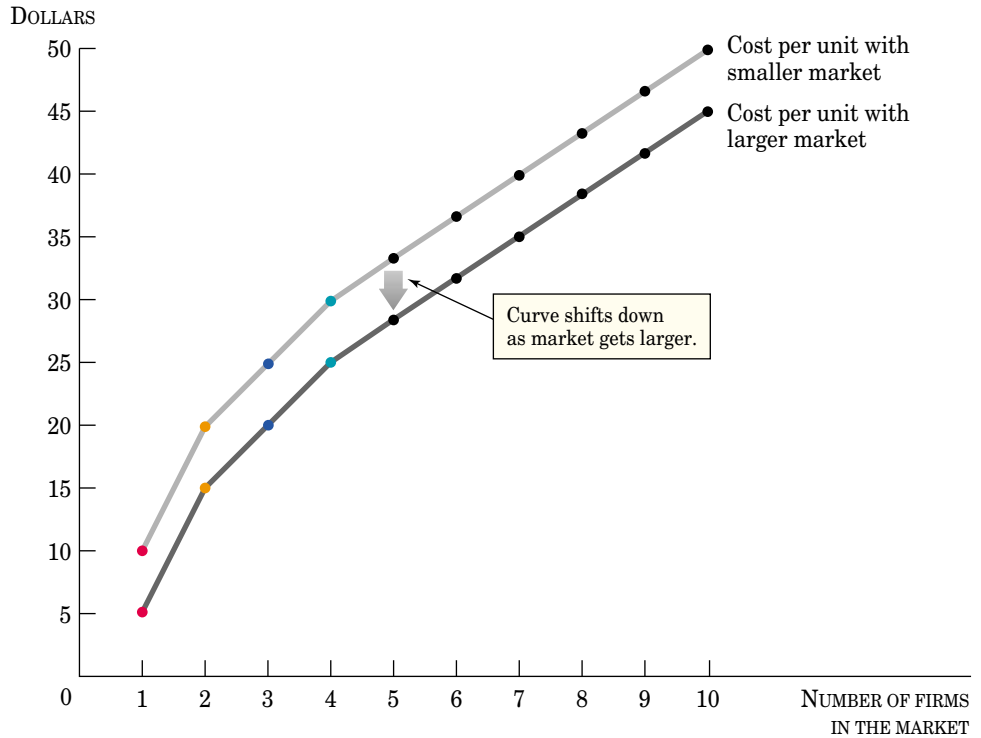


Figure 17.3 summarises the information in figure 17.2. It shows the positive relationship between the number of firms in the market, shown on the horizontal axis, and the cost per unit at each firm. As the figure indicates, more firms mean a higher cost per unit at each firm. (Be careful to note that the horizontal axis in figure 17.3 is the *number* of firms in a given *market*, not the quantity produced by a given firm.) When the size of the market increases, the relationship between the number of firms in the market and the cost per unit shifts down, as shown in figure 17.3. In other words, as the market increases in size, cost per unit declines at each firm if the number of firms does not change.

**FIGURE 17.3**  
*The relationship between cost per unit and the number of firms*

The first four points on each curve are plotted from the two tables in figure 17.4 for 1 to 4 firms; the other points can be similarly obtained. Each curve shows how cost per unit at each firm rises as the number of firms increases in a market of a given size. The curve shifts down when the size of the market increases.

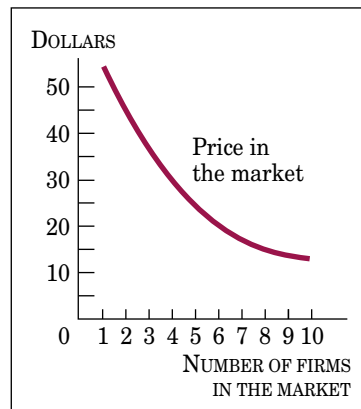


### A relationship between the price and the number of firms

A general feature of most markets is that as the number of firms in the market increases, the price at each firm declines. More firms make the market more competitive. Thus, there is a relationship between the price and the number of firms, as shown in figure 17.4. As in figure 17.3, the number of firms is on the horizontal axis. The curve in figure 17.4 is downward-sloping because more firms mean a lower price.

**FIGURE 17.4**  
*The relationship between the price and the number of firms*

As the number of firms increases, the market price declines. This curve summarises this relationship.



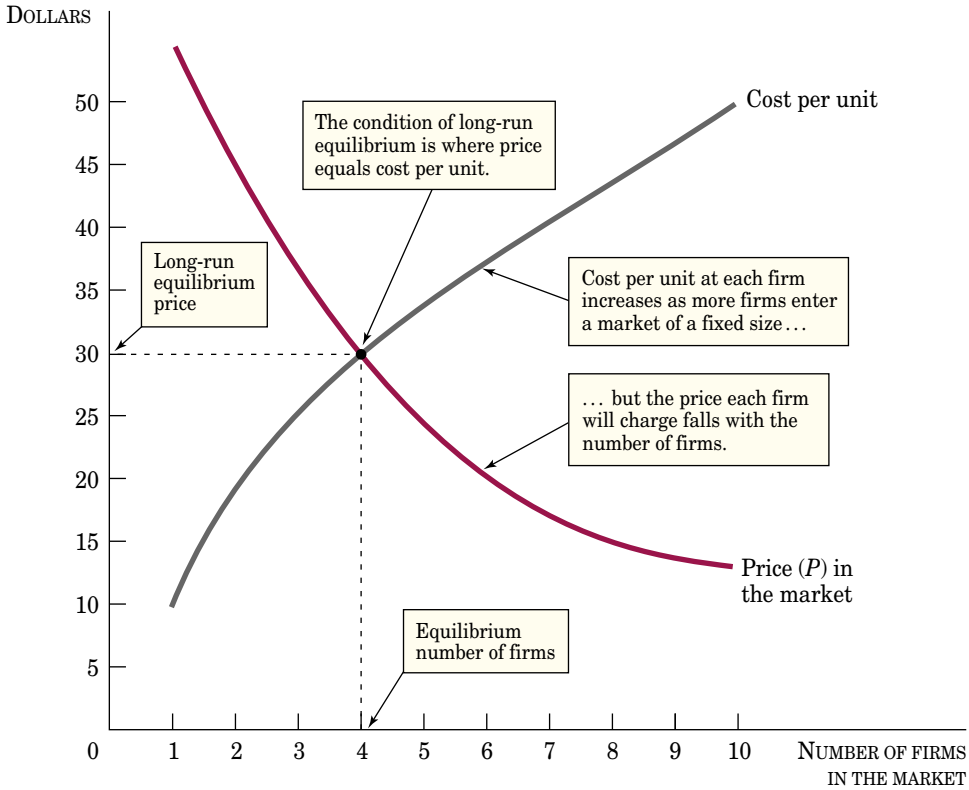
### Equilibrium price and number of firms

In the long run as firms either enter or exit an industry, price will tend to equal cost per unit. If the price for each unit were greater than the cost per unit, then there would be a profit opportunity for new firms; the number of firms in the

industry would rise. If the price were less than the cost per unit, then firms would exit the industry. Only when price equals cost per unit is there a long-run equilibrium. Because price equals cost per unit, the curves in figures 17.3 and 17.4 can be combined to determine the price and the number of firms in long-run equilibrium. As shown in figure 17.5, there is a long-run equilibrium in the industry when the downward-sloping line for figure 17.4 intersects the upward-sloping line (for the smaller market) from figure 17.3. At this point, price equals cost per unit.

Corresponding to this long-run equilibrium is an equilibrium number of firms. More firms would lower the price below cost per unit, causing firms to leave the

industry; fewer firms would raise price above cost per unit, attracting new firms to the industry. Figure 17.5 shows how the possibility of entry and exit results in a long-run equilibrium with price equal to cost per unit.



**FIGURE 17.5**  
**Long-run equilibrium number of firms and cost per unit**  
 A condition for long-run equilibrium is that price equals cost per unit. In this diagram this condition is shown at the intersection of the two curves.

**Increasing the size of the market**

Now let us see how the industry equilibrium changes when the size of the market increases due to international trade. In figure 17.6 we show how an increase in the size of the market, due perhaps to the creation of a free trade area, reduces the price and increases the number of firms. The curve showing the cost per unit of each firm shifts down and out as the market expands; that is, for each number of firms the cost per unit declines for each firm. This brings about a new intersection and a long-run equilibrium at a lower price. Moreover, the increase in the number of firms suggests that there will be more product variety, which is another part of the gain from trade.

**The North American car market**

The gains from trade due to larger markets arise in many real-world examples. Trade in cars between Canada and the United States now occurs even though neither country has an obvious comparative advantage. Before 1964 trade in cars between Canada and the United States was restricted. Canadian factories thus had to limit their production to the Canadian market. This kept costs per unit high. When free trade in cars was permitted, the production in Canadian factories increased, and the Canadian factories began to export cars to the United States. By producing more cars, cost per unit declined. The term new trade theory refers to the models of international trade that emphasise the size of the market and its effect on cost per unit.

**FIGURE 17.6**

**Gains from trade due to larger markets**

When trade occurs, the market increases from the size of the market in one country to the combined size of the market in two or more countries. This larger market shifts the upward-sloping line down because cost per unit for each firm is lower when the market is bigger. In the long-run equilibrium at the intersection of the two new curves the price is lower and there are more firms. With more firms, there is more variety. Lower price and more variety are the gains from trade.

