Chapter 8  
Firms in the Global Economy: Export Decisions, Outsourcing, and Multinational Enterprises

1. ◼ Chapter Organization

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  Monopolistic Competition

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Appendix: Determining Marginal Revenue

1. ◼ Chapter Overview

In previous chapters, trade between nations was motivated by their differences in factor productivity or relative factor endowments. The type of trade which occurred, for example of food for manufactures, is based on comparative advantage and is called *interindustry trade*. This chapter introduces trade based on internal economies of scale in production. Such trade in similar productions is called *intraindustry trade*, and describes, for example, the trading of one type of manufactured good for another type of manufactured good. It is shown that trade can occur when there are no technological or endowment differences, but when there are economies of scale or increasing returns in production.

Economies of scale can either take the form of (1) *external economies*, whereby the cost per unit depends on the size of the industry but not necessarily on the size of the firm; or as (2) *internal economies*, whereby the production cost per unit of output depends on the size of the individual firm but not necessarily on the size of the industry. Whereas chapter 7 looked at external economies of scale, this chapter focuses on internal economies of scale. Internal economies of scale give rise to imperfectly competitive markets, unlike the perfectly competitive market structures that were assumed to exist in earlier chapters. This motivatesthe review of models of imperfect competition, including monopoly and monopolistic competition. The instructor should spend some time making certain that students understand the equilibrium concepts of these models since they are important for the justification of intraindustry trade.

In markets described by monopolistic competition, there are a number of firms in an industry, each of which produces a differentiated product. Demand for its good depends on the number of other similar products available and their prices. This type of model is useful for illustrating that trade improves the trade-off between scale and variety available to a country. In an industry described by monopolistic competition, a larger market—such as that which arises through international trade—lowers average price (by increasing production and lowering average costs) and makes available for consumption a greater range of goods. While an integrated market also supports the existence of a larger number of firms in an industry, the model presented in the text does not make predictions about where these industries will be located.

It is also interesting to compare the distributional effects of trade when motivated by comparative advantage with those when trade is motivated by increasing returns to scale in production. When countries are similar in their factor endowments, and when scale economies and product differentiation are important, the income distributional effects of trade will be small. You should make clear to the students the sharp contrast between the predictions of the models of monopolistic competition and the specific factors and Heckscher-Ohlin theories of international trade. Without clarification, some students may find the contrasting predictions   
of these models confusing. The chapter presents the case study of the 1964 North American Auto Pact which lowered trade barriers in trade of automotive products between Canada and the U.S. With trade driven by internal economies of scale, the smaller country tends to gain more from trade. This is supported by the increase in exports of automotive products from Canada to the U.S., rising from $16 million in 1962 to $2.4 billion in 1968.

Another important issue related to imperfectly competitive markets is the practice of price discrimination, namely charging different customers different prices. One particularly controversial form of price discrimination is dumping, whereby a firm charges lower prices for exported goods than for goods sold domestically. This can occur only when domestic and foreign markets are segmented. The economics   
of dumping are illustrated in the text using the example of an industry which contains a single monopolistic firm selling in the domestic and foreign market. While there is no good economic justification for the view that dumping is harmful, it is often viewed as an unfair trade practice.

The chapter concludes with a discussion of foreign direct investment (FDI). FDI may be horizontal or vertical. With horizontal FDI, a firm replicates its production process in multiple locations. With vertical FDI, a firm breaks up its production chain across multiple locations. The decision by a multinational to engage in FDI is driven by a proximity-concentration tradeoff. Internal economies of scale give an advantage to locating all production in one location. However, trade costs increase the cost of exporting from a single location. Thus FDI is more likely when trade costs are high and internal economies of scale are low. Finally, a multinational must decide whether to engage in direct foreign production through a foreign affiliate or to engage in outsourcing. The former is more likely when the multinational has a proprietary technology that it is concerned about losing control over or if foreign firms cannot produce as efficiently as direct production through a foreign affiliate.

1. ◼ Answers to Textbook Problems

1. With internal economies of scale, there is imperfect competition and firms set marginal revenue equal to marginal cost. Unlike the case of perfectly competitive markets, under monopoly marginal revenue is not equal to price. Marginal revenue is always less than price under imperfectly competitive markets because to sell an extra unit of output, the firm must lower the price of all units, not just the marginal one. Furthermore, if internal economies of scale are driven by large fixed costs, then setting price equal to marginal cost would actually lead to negative profit for a firm that needs to set price above marginal cost to cover its fixed costs.

2. To solve this problem, we need to first find the equilibrium number of firms in the three country integrated market by setting average cost equal to price across all markets. We do this by first noting that average cost can be written as *AC = (nF/S) + c* and price can be written as *P = c + (1/bn)*, where *n* is the number of firms, *F* is the fixed cost, *S* is the market size, *c* is the marginal cost, and *b* is a constant. Setting the average cost equal to price yields the following expression:

*(nF/S) + c = c + (1/bn)*

*n2 = (1/b)\*S/F*

*n = [(1/b)\*S/F]1/2*

The numerical problem in the chapter gives us the following values

*F = 750,000*

*SHome = 900,000, SForeign = 1,600,000, SCountry 3 = 3,750,000*

*c = 5,000*

*b = 1/30,000*

Note that the fixed cost *F* is stated in the text to be 750,000,000, but if you look at the solutions presented in Figure 8-5, you will see that *F* must equal 750,000. Finally compute the total market size as the sum of the market sizes in Home, Foreign, and Country 3:

*S = SHome+SForeign+SCountry3 = 900,000 + 1,600,000 + 3,750,000 = 6,250,000*

Now plug in these values to solve for *n*:

*n = [30\*6,250/750]1/2 = [250]1/2 = 15.8*

As we cannot have 0.8 firms enter into a market, we know that there will only be 15 firms that enter this market (the 16th firm knows that it cannot earn positive profits and will not enter). Once we know *n*, then solving for *Q* and *P* is straightforward:

*Q = S/n = 6,250,000/15 = 416,667*

*P = c + (1/bn) = 5,000 + 30,000/15 = 7,000*

3. We are given the following information (with all dollar amounts in thousands):

*F = 5,000,000,000*

*c = 17,000*

*SUS = 300,000,000 SEU = 533,000,000*

*P = c+(1/bn) = 17,000 +(150/n)*

a. The condition we derived in problem #2 was *n =[(1/b)\*S/F]*. Looking at the Price equation above, we see that 1/b = 150. Plug in the relevant parameters to solve for the equilibrium number of firms in the US and the EU:

*nUS = [150\*300,000,000/5,000,000,000]1/2 = [9]1/2 = 3*

*nEU = [150\*533,000,000/5,000,000,000]1/2 = [16]1/2 = 4*

b. Without trade, there will be different prices in Europe and the US:

*PUS = 17,000 + (150/3) = 17,050*

*PEU = 17,000 + (150/4) = 17,037.5*

c. After trade, the new market size is *S = 300,000,000 + 533,000,000 = 833,000,000*

Simply plug this new market size into the equilibrium number of firms expression from part a:

*n = [150\*833,000,000/5,000,000,000]1/2 = [25]1/2 = 5*

*P = 17,000 + (150/5) = 17,030*

d. US prices are lower in part c because of internal economies of scale. After trade, total world automobile production is produced by only 5 firms as compared to 7 firms before trade (3 in the US, 4 in the EU). These 5 firms each produce a larger quantity than the 3 US firms did before trade. Since average costs fall as the quantity of production rises, the price of an automobile will fall as average production per firm rises. As a result, US consumers benefit from free trade through lower prices.

4. a. We can model this decision by defining the technology in the following terms: If a firm invests in the technology, it will face a fixed cost *T*, but face a marginal cost *cT* which is lower than its marginal cost *c* without the technology. Thus we define the firm’s total cost with and without the technology as:

Cost without Technology = *TC = cQ + F*

Cost with Technology = *TC\* = cTQ + F + T*

A firm will choose to adopt this technology whenever *TC\* < TC*:

*cTQ + F + T < cQ + F*

*T < (c – cT)Q*

*Q > T/(c – cT)*

As with most decisions involving fixed costs, the technology is more likely to increase a firm’s profits when the scale of production increases.

Now compare a firm with low marginal costs and one with high marginal costs. The gap *c – cT* will be smaller for a low marginal cost firm than for a high marginal cost firm. Thus, a firm with low marginal cost will need a higher level of output to justify the technology than a firm with high marginal costs. So it is possible that some firms (high cost firms) will choose to adopt the technology while others (low cost firms) do not.

b. Trade costs raise the marginal cost of exporting. A firm that exports faces a higher marginal cost than one that does not export, and will therefore be more likely to use this new technology.

5. a. We know that the number of firms competing in a market increases as the size of the market rises. At the same time, the price charged in a market falls as the number of firms competing in that market rises. Thus, as the number of firms increases, the price charged by exporters (and domestic firms) will fall. This increases the probability that a dumping charge will be filed.

b. A firm exporting from a small country to a large country will experience a larger difference between its domestic price (higher) and its export price (lower) since there will be more firms competing in the larger country. Thus, a firm exporting from a small country to a large country will be more likely to be accused of dumping than a firm exporting from a large country to a small country.

6. a. $10 million of IBM stock is nowhere near 10% of the total market value of IBM. Thus, this is not considered Foreign Direct Investment.

b. A New York apartment building is considered an asset, so its purchase (100% ownership) by a foreign national would be an example of Foreign Direct Investment.

c. This merger would represent more than 10% ownership of the American company by the French company and is therefore Foreign Direct Investment.

d. If the Italian firm retains ownership of the plant in Russia, then this is Foreign Direct Investment. If, however, the Italian firm simply built and managed the plant, but it was owned by the Russian government, this would not be Foreign Direct Investment.

7. a. This would be a horizontal FDI outflow from the U.S. and a horizontal FDI inflow into Europe.

b. This would be a vertical FDI outflow from France and inflow into Cameroon.

c. This would be a horizontal FDI outflow from Germany and inflow into the U.S.

d. This would be a vertical FDI outflow from Switzerland and inflow into Bulgaria.

8. Even with internal economies of scale, there may still be an advantage to producing the same good in multiple production facilities. This is an example of the proximity-concentration trade-off. The advantage of producing in only one location is that economies of scale are maximized. However, producing in only one location exposes this firm to trade costs when it exports from that location. If these trade costs are high enough, it may be more efficient to locate production in multiple locations. The number of locations is limited by the losses from splitting production and losing out on economies of scale.

9. This question relates to the decision by a multinational to outsource production or to engage in direct production through foreign affiliates. A multinational may prefer to use a foreign affiliate if it has a proprietary technology that it is concerned about losing through outsourcing (perhaps due to weak property rights in foreign countries) or if it doubts the ability of other firms to produce as efficiently as it could. Capital intensive industries are more likely to have proprietary technologies or complex production processes that make foreign affiliate production a better choice for a multinational.

10. Intra-firm trade will be higher in industries with a high degree of vertical FDI. As capital intensive industries are likely to have more vertical FDI for the reasons outlined above, we should expect more intra-firm trade in these industries. This is supported by the higher degree of intra-industry trade in capital intensive industries in Table 8-3.