Monopoly and Dominant Firms: Antitrust Economics and Policy Approaches

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Abstract

This chapter addresses issues in antitrust economics that related to the exercise of market power by a monopoly or by a dominant firm. We start by presenting the standard textbook treatments of monopoly and the dominant firm and then discuss the non-trivial issues of what constitutes a real-world monopoly (or dominant firm) and how to identify it. With that as a basis, we discuss five categories of antitrust actions that can be used to limit the exercise of market power by a monopoly or dominant firm.

Key words: Monopoly; dominant firm; market power; antitrust; Lerner Index; predation; exclusion

JEL codes: D41; D42; D43; L12; L13; L41; L42

I. Introduction.

The primary purpose of antitrust – at least, modern antitrust – is to limit the exercise of market power.[1] By market power we mean the ability of an enterprise/firm to maintain the price at which it sells its product at a level that is significantly above its average (unit) costs, when "costs" are understood to encompass "opportunity costs" and thus to include a competitive return on the investment that has been made in the enterprise.[2] In this chapter we will specifically be focusing on a "monopoly" or a "dominant firm" as the enterprise that can exercise its market power.[3]

There are at least seven ways that government policy can limit the ability of an enterprise unilaterally to exercise market power:

1) Prevent/stop agreements among firms that restrict competition among them and that thereby allow the individual firms to continue to exercise unilateral market power. An example of such an agreement would be an understanding between two firms that Firm A would refrain from trying to sell to customers in Firm B's geographic territory (or to Firm B's particular category of customers), and vice versa.

2) Prevent/stop mergers that would otherwise allow the merged firm to exercise market power (where the separate entities previously did not exercise market power) or that would otherwise allow a firm with market power to enhance that power.

[1] This chapter will have an unavoidable United States orientation, since U.S. antitrust policy is what the author knows best. Indeed, we will use the word "antitrust", rather than the phrase "competition policy": The former is a more common U.S. usage; the latter is more commonly used outside of the U.S. Nevertheless, the basic ideas that are developed in this chapter have widespread applications in the international contexts that this Handbook encompasses, although the specific instances discussed in the chapter will be U.S.-oriented.

[2] By using this definition, we will try to sidestep what – at least to this author – appears to be an uninteresting discussion as to whether there is a useful distinction between "market power" and "monopoly power".

[3] We will thus leave the discussion of the collective exercise of market power by a group of firms – whether they are explicitly colluding or, in the case of a small number of firms ("oligopoly"), implicitly recognizing their interdependence – to other chapters in this Handbook. In addition, most of the concepts that are developed with respect to "monopoly" in this chapter would apply in a similar fashion to an enterprise that acts as a single buyer – a monopsonist – that exercises its market power vis-à-vis the sellers that it faces. But, again, we will leave that discussion to other chapters in this Handbook.

3) Prevent/stop predatory behavior by a firm that can enhance its market power by driving rivals out of the market.[4]

4) Prevent/stop exclusionary behavior by a firm that can enhance its market power by thereby disadvantaging its rivals; such behavior is often described as "raising rivals' costs".[5]

5) Dismember the firm, so as to create multiple competitive entities where there was a single seller before, so that the competitive behavior of the created firms reduces or eliminates the original firm's market power. This is often described as a "structural" approach to addressing issues of market power.

6) Regulate the firm that possesses market power – e.g., by specifying a maximum price that approximates the firm's average costs and/or limiting the extent to which the firm charges different prices to different customers for essentially the same item (i.e., price discrimination).

7) Replacing the firm with a public enterprise that would charge a price that is closer to the firm's average costs (on the assumption that the government enterprise's costs would be the same as the private firm's costs).[6]

The first five of these alternatives are part of antitrust policy and will be discussed in this chapter. Discussions of regulation and of government enterprise will be left to other Handbooks, although there are chapters in this Handbook that address the intersection of antitrust and these other two policies.[7]

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[4] Although, in principle, a firm that previously lacks market power might engage in predatory or exclusionary behavior and thereby acquire market power, by far the most common allegations are that a firm that already has market power has engaged in predatory and/or exclusionary actions so as to enhance its market power (or to prevent its erosion).

[5] See Salop and Scheffman (1983, 1987).

[6] A variant on this approach would be to establish a public enterprise that would compete with the firm.

[7] In principle, "antitrust" could be broadly defined to encompass judicial decisions that would cause judges to become the regulators of the prices that firms with market power are allowed to charge. But, for the most part, U.S. antitrust policy has not gone in that direction. One exception might be Section 2 of the Clayton Act, which, after its strengthening in the 1930s, has come to be known as the Robinson-Patman Act. The Robinson-Patman Act attempts to restrict the ability of firms to practice price discrimination. However, enforcement of the Robinson-Patman Act

This chapter will proceed as follows: First, we will present the standard textbook treatments of monopoly and the dominant firm and discuss the non-trivial issues of what constitutes a real-world monopoly (or dominant firm) and how one would go about identifying it. With that as a foundation, we will then address the five categories of antitrust policy that were listed above. A brief conclusion will follow.

II. Monopoly and the dominant firm: conceptual and real-world issues.

A monopoly is the sole seller of a distinctive product (or service). Note that a monopolist need not be the sole seller of everything in an economy; it only needs to be the sole seller of something that is sufficiently distinctive (and that it is sold in large enough volumes that it is worth noticing[8]). There may be partial or imperfect substitutes for the item; but it does need to be distinct. For example, if a single enterprise was the sole producer and seller of all beef in the U.S., then it is likely that most observers (except, perhaps, the owners of the firm, and their antitrust lawyers) would consider this enterprise to be a monopoly, even though lamb and pork and chicken, as well as non-meat foodstuffs, would be considered to be partial substitutes for beef.

A. A simple monopoly framework.

Perhaps the easiest way to conceptualize the ability of a monopoly to exercise market power is to start with a distinctive item that has no substitutes, as in the following: Suppose that there are a 10 million potential customers for a distinctive item that will be called a "gadget". Each customer is willing to buy, at most, a single gadget each week; and each customer has a maximum willingness to pay (each week) for a gadget of $10.00. At a price of even $10.01, all

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by the federal antitrust enforcement agencies has effectively disappeared; and even private suits under the Act today are relatively rare.

[8] This is an issue to which we will return below.

10 million customers would refuse to buy; at a price of $10.00 or less per gadget, all 10 million customers will each buy one gadget (per week). The "demand curve" for gadgets in this example is portrayed in Figure 14-1, where the quantity of gadgets per week is measured on the horizontal axis and dollar amounts (prices and costs) are measured on the vertical axis.

Suppose that the unit costs (including a normal profit[9] on the investment in the firm) of producing gadgets – regardless of the volume produced per week – are $6 per gadget. These are also represented on Figure 14-1.

If there is a single producer/seller of gadgets that wishes to maximize its profits, then it is clear that the price that will do so is $10/gadget; this is represented in Figure 14-1 as P_M. The monopolist would sell 10 million gadgets per week; and, since its unit costs are $6/gadget, the monopolist's (above-normal) profits would be $40 million per week; in Figure 14-1 these profits are represented by the rectangle $P_M y x P_C$. Any higher price would cause all of the customers to refrain from buying; any lower price would "leave money on the table," since no additional customers would be induced to buy. At $10/gadget, the monopolist would be "charging what the market would bear."[10]

By contrast, if there were multiple firms that each produced identical gadgets[11] and that competed on the basis of price, the equilibrium price would be only $6 per gadget (which is represented as P_C in Figure 14-1). At any higher price, one or more of the competitive firms would find it worthwhile to charge a price that was closer to $6, in the hopes of attracting all of the customers while still charging a price that yielded profits that were above those that were already embedded in the unit costs; any price that was lower than $6 per gadget would not be

[9] By this we mean the profit on the investment in the firm that could otherwise be earned in a competitive industry.
[10] In more technical terms, at a price of $10, the demand relationship experiences infinite elasticity with respect to price at any higher price and zero elasticity at any lower price.
[11] Note that a gadget is still distinct from all other goods and services; but, since each producer/seller's gadget is identical to all other producer/sellers' gadgets, they are all selling "commodity" gadgets.

worthwhile, since a seller would not thereby be covering its full costs (again, including full opportunity costs), unless the seller hoped that it could thereby permanently drive out its rivals and emerge as an unchallenged monopolist (which could charge $10 per gadget, etc.); so long as it is easy for firms to enter and exit the gadget industry, this last expectation would be unlikely to be held.[12]

It is clear, then, that the monopolist's profits have come at the expense of consumers. If competition prevails, consumers would be able to buy at a price of $6 the gadgets that they value at $10, and they enjoy a "consumer's surplus" of $4/gadget, which aggregated across all consumers would be represented by the rectangle $P_M yx P_C$ in Figure 14-1; if monopoly prevails, consumers pay the full $10/gadget, and the consumers' surplus that they enjoyed under competition is transferred to the monopolist and is the source of the latter's profits.

Further, it is clear that if consumers valued gadgets at $12 each, the monopolist's profits would be yet higher; if consumers' valuation of gadgets were only $8, the monopolist's profits would be lower; but at either valuation, the competitive price would still be $6/gadget. Thus, while the monopolist is able to charge "what the market will bear" (i.e., the maximum that consumers are willing to pay), the competitive price will be anchored at the competitive industry's costs (so long as the supply of gadgets can be expanded at the constant unit costs of $6/gadget).

B. The "Lerner Index".

One convenient way of measuring and representing the market power of an enterprise is provided by the so-called "Lerner Index",[13] which is written as:

[12] We will discuss below the issues that surround "predatory pricing", where the claim is that a firm has deliberately tried to drive rivals out of the market.

[13] Since Lerner (1934) was the first to popularize this formulation of market power, this is often called the Lerner index; for some historical perspective, see Elzinga and Mills (2011). Lerner also popularized the relationship by

$$L = (P - MC)/P, \qquad (14.1)$$

where L is the indicator of market power, P is the price at which the firm sells its output, and MC is the marginal cost of the firm for the volume of output that the firm is selling.[14] For the monopolist, L will always be a positive number that approaches 1.0 as P gets larger relative to MC. In the example above, when the monopolist charges \$10/gadget, L = 0.67; whereas, for the competitive firms discussed above, L = 0.

C. A somewhat more complex monopoly example.

Let us now suppose that the demand structure for gadgets is more complex than the simple example above. Suppose instead that various buyers have different willingnesses to pay for their single gadget per week and/or some buyers may be willing to buy larger numbers of gadgets per week when the price of gadgets is lower. Thus, at higher prices fewer gadgets would be bought, while at lower prices more gadgets would be bought. A linear representation of this "sloped" demand relationship (designated as D) is provided in Figure 14-2.[15] Again, we will assume that the costs of producing gadgets involve constant unit costs, regardless of volume.

The monopolist's problem is now more complex: There is no single price that represents "what the market will bear". If the monopolist again seeks to maximize its profits and can charge only a single price to its customers – i.e., it cannot practice price discrimination by charging a high price to some of its customers (who have a high willingness to pay for gadgets) while simultaneously charging a lower price to other customers (who have a lower willingness to pay) – then it faces a tradeoff: The monopolist could sell gadgets at a very high price (and have

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showing that $L = (P - MC)/P = -1/\varepsilon$, where ε is the own-price elasticity of demand for the firm's product. This last relationship can be derived from the first-order condition for a firm to maximize its profits. It is worth noting that it appears that Lerner's derivation was apparently preceded by a similar derivation of this relationship by Amoroso (1930); see Keppler (1994) and Giocoli (2012).

[14] In the numerical example above, the firm's marginal costs are equal to its average or unit costs.

[15] This is the standard diagrammatic representation of monopoly, which appears in virtually all microeconomics textbooks.

high per-unit margins), but would sell comparatively few per week; or the monopolist could sell gadgets at a comparatively low price and sell many more per week, but its margins would be slim.

The quantitative solution to the monopolist's problem – what price to charge (or, equivalently, what quantity to sell), so as to maximize its profits – requires the use of simple calculus: If the monopolist's profits are represented by π, its price by P, the quantity produced/sold by Q, and its costs of producing the requisite gadgets as C, then:

$$\pi = PxQ - C \quad ; \qquad (14.2)$$

and taking the derivative of this equation with respect to the quantity to be sold (or with respect to the price to sell it at) yields the result that the monopolist should sell a quantity of gadgets each week such that the marginal revenue (MR) from selling a slightly larger (or slightly smaller) quantity is equal to the marginal cost (MC) of producing that quantity; or

$$MR = MC \quad . \qquad (14.3)$$

This outcome is shown geometrically in Figure 14-2, where Q_M represents the quantity at which MR = MC, and P_M represents the price at which that quantity can be sold. The monopolist's (maximized) profits can again be represented by the rectangle $P_M y x P_C$.

Further, it is straightforward to demonstrate that an implication of MR = MC is that the monopolist's profit-maximizing price bears the following relationship to its marginal costs and to the elasticity of demand (ε):[16]

$$P_M = MC/(1 + 1/\varepsilon) \quad . \qquad (14.4)$$

[16] Where elasticity of demand is defined as the percentage change in quantity that accompanies a given percentage change in price; this is expected to be a negative number, since a price increase will cause a quantity decrease, and conversely.

Thus, the monopolist's profit-maximizing price will be higher when its marginal costs are higher and when its demand is less elastic (i.e., the quantity demanded is less responsive to price changes). The monopolist will thereby be interested in reducing its costs and in undertaking actions (e.g., advertising and other forms of marketing and promotion) that expand the demand for gadgets but also that make the demand less elastic (e.g., that instills in buyers a stronger sense of "Gotta have it!").[17]

Also, as was noted above, from equation 14.4, the Lerner Index can be shown to be equal to:

$$L = (P - MC)/P = -1/\varepsilon \quad . \qquad (14.5)$$

The Lerner Index thus indicates that the monopolist is exercising more market power when its demand curve is less elastic.

In contrast to the monopolist, a competitive group of sellers that each sold identical gadgets and faced the same aggregate demand for gadgets and the same cost structure as does the monopolist would sell gadgets at an equilibrium price of P_C. and would sell (in aggregate) a quantity Q_C. These are illustrated in Figure 14-2 as well. Thus, the competitive industry sells at a lower price (again, anchored to its costs of production) and sells a larger aggregate volume. Further, the loss to consumers from the replacement of competition with monopoly is now more complex: In addition to the transfer of consumer surplus from buyers to the monopolist (rectangle $P_M yx P_C$), there is also the loss of consumer surplus by buyers who would have bought gadgets at the competitive price P_C but whose willingness to pay for gadgets is less than P_M. These gadget purchases (represented in Figure 14-2 by the distance $Q_C - Q_M$) simply aren't made; the buyers instead buy other (lesser valued) things; and the aggregated lost value to these

[17] However, as Eq. 14.4 makes clear, so long as the monopolist's marginal costs are positive, the profit-maximizing price-quantity combination will be in the "elastic" portion of the firm's demand curve; i.e., where $|\varepsilon| > 1.0$.

shut-out buyers – the social inefficiency of monopoly – can be approximately represented by the area of the triangle yzx.

And, again, the Lerner Index will show a positive value for the monopolist, while showing a value of L = 0 for the competitive group of sellers.

D. The dominant firm and the reactive fringe.

There appear to be industries where there is not a single-firm monopoly, but there is nevertheless a dominant firm with an apparent market share that exceeds 50% and a number of smaller firms that account for smaller shares.[18] Modern examples would appear to be Google in on-line search; Intel in microprocessors; Apple in tablets; eBay in on-line auctions; and Microsoft in personal computer operating systems. Older examples would include AT&T in long-distance telephone service; Alcoa in aluminum; IBM in mainframe computers; Xerox in photocopy machines; and Kodak in film and cameras.

If the other firms in the industry are few and have noticeable market shares, then strategic behavior among them is likely to prevail; and that puts the structure of the industry into the category of "oligopoly," which is not the topic for this chapter. However, if the other firms are small and reactive (rather than strategic), a model that retains the basic features of monopoly can emerge.[19] That dominant firm model can be described as follows:

Suppose that there is a enterprise that has a special production advantage – say, exclusive access to a superior technology – that allows it to produce a distinctive product (that we will again call a "gadget") at lower costs than can other firms. In Figure 14-3 we represent the (sloped) market demand for gadgets per week and the enterprise's costs of producing gadgets

[18] What constitutes the "market" and hence how to measure "market shares" is an important but subtle point to which we will return below.

[19] This model is generally attributed to Stigler (1940), with revivals by Saving (1970) and Landes and Posner (1981); for a discussion, see Elzinga and Mills (2011). However, it appears that Amaroso (1938) preceded even Stigler; see Giocoli (2012).

(which we again portray, for the purposes of expositional simplicity, as a horizontal line of constant unit costs, regardless of volume).

If the firm were the sole seller of gadgets, then the analysis would revert to that of Figure 14-2. However, there are a number of other firms that can also produce (identical) gadgets, but at higher costs than is true for the enterprise with the special technology (which, from this point forward, we will describe as the "dominant" firm). We will assume that these fringe firms are reactive, in the following sense: Rather than acting strategically, these firms simply react to a perceived price in the marketplace by supplying a quantity of gadgets that is consistent with simple (non-strategic) profit-maximizing behavior: the quantity at which their marginal costs (MC) are equal to their marginal revenue (MR), which in turn is equal to the price; i.e., the quantity at which P = MR = MC. The aggregate supply of gadgets that would be available from the reactive fringe firms at various prices is also portrayed in Figure 14-3.[20]

In order to maximize its profits, the dominant firm has to take the fringe's reactive supply into account in formulating its pricing decision.[21] One possibility would be to practice "limit pricing": to set a price that is just below the level that would begin to induce a supply response by the fringe. In Figure 14-3, this would be price P_L, and the consequent profits would be represented by rectangle $P_L wv P_C$.[22]

However, as a general matter, a superior strategy for the dominant firm is to treat the supply by the fringe as a "given" feature of the market. In essence, the fringe's supply of

[20] We will also assume that entry by the fringe firms (or their equivalents) is sufficiently easy, so that they cannot be permanently driven from the marketplace by a sustained period of low pricing by the dominant firm.

[21] Of course, if the fringe firms' costs were so high that they were not a realistic challenge to the dominant firm (i.e., if point P_L is sufficiently far up the vertical axis), then the dominant firm can simply ignore them, and the analysis reverts to that of Figure 14-2 and the unhindered monopolist.

[22] If the price of P_L would cause the fringe to go out of business and no other firms would replace them, then the dominant firm would subsequently have the entire market to itself and would thus be able to charge the unfettered monopoly price. For the remainder of the discussion of the dominant firm we will assume that the fringe cannot be permanently driven from the marketplace. In Section III we will address the issue of "predatory pricing", whereby a firm is alleged to try to drive rivals permanently out of the market.

gadgets unavoidably subtracts from the demand that is available to the dominant firm. The dominant firm thus has available to it a "residual demand": the aggregate market demand at every price, minus the fringe's supply at that price. It is with respect to this residual demand curve (which is portrayed in Figure 14-3) that the dominant firm should calculate its marginal revenue and thus arrive at the quantity (and price) at which MR = MC. In Figure 14-3 this is indicated by Q_D and P_D, and the dominant firm's profits are indicated by rectangle P_DyxP_C. At the price P_D, the aggregate market demand is larger than Q_D, and the remainder is supplied by the fringe.

Finally, if the dominant firm's production technology were somehow readily available to a group of competitive firms, the outcome would again be P_C and Q_C. So, again, the dominant firm (as a quasi-monopolist) causes the price to be higher and the quantity sold lower than if full competition (using the superior technology) could prevail.

Thus despite the presence of the fringe (or, equivalently, because of the technological limits faced by the fringe), the dominant firm – though technically not a "monopolist", since it is not the sole seller of gadgets – still maximizes its profits on the basis of an unambiguous MR = MC calculation; perhaps "quasi-monopolist" would be an appropriate descriptor. However, what this portrayal does highlight is that the dominant firm's profits are limited by the fringe firms. If the fringe were absent (so that the dominant firm had the entire market demand to itself) or the fringe were weaker (in the sense that the fringe firms' costs were higher, so that the dominant firm had more of the aggregate market for itself), the dominant firm could charge a higher price, its market power (as measured by the Lerner Index) would be greater, and its profits would be larger. Accordingly, the dominant firm would be interested in undertaking activities that would

raise the costs of its fringe competitors or would otherwise make their economic life more difficult.[23] We will return to this point in our discussion of antitrust policy below.

Finally, although the dominant firm model that was described above was based on a the dominant firm's superior cost technology in producing a generic item that is readily replicable (but at higher costs) by other firms, the same intuitive idea should carry over to a model of branded (and thus differentiated) goods or services: There could be a firm with a strong brand that is able to garner a large market share in a particular consumer goods category – say, laundry detergent – and a fringe of smaller firms with weaker brands (and that may or may not have the same production costs as the dominant firm). Based on the relative strength of its brand, the dominant firm would be able to charge higher prices and earn higher profits than could the fringe. And the dominant firm would be interested in measures that could weaken the fringe and thereby strengthen the market power of the dominant firm.

E. How does monopoly arise?

We have already indicated that a monopoly must be selling an item that is distinctive. It would be a contradiction in terms to describe a "monopoly" as one among a number of firms that are all selling the same product. Indeed, for the dominant firm model that was just discussed, we acknowledged that "monopoly" was not quite right and suggested "quasi-monopoly". But more than just distinctiveness is needed.

That "more" – as Bain (1956) recognized – are barriers to entry: Without barriers to entry, the above-normal profits of the monopolist could not persist. Potential sellers of the same or a closely similar product that are otherwise equally situated would be attracted by those above-normal profits, and their additional supply would cause the equilibrium price to fall. So

[23] This would also be true, of course, if the dominant firm faces just a few rivals who act strategically.

long as the prospects of above-normal profits remained, entry would continue to occur. Only when the price was driven down to the level of P_C would entry cease.

There are basically three categories of entry barriers:

1. Ownership of a unique resource. The ownership of a unique resource constitutes one important potential barrier to entry. Examples would include: a) a unique mineral deposit or other natural resource; b) a unique government franchise (e.g., the right to be the sole provider of local taxicab services); c) an especially distinctive patent;[24] or an especially distinctive production technology.[25] This last category is the foundation for the dominant firm model that was discussed above.

2. Economies of scale. If the technology of an industry is such that economies of scale – i.e., that the unit costs of production are always lower at higher rates of production per unit of time than at lower rates[26] – then a single firm (a "natural monopoly") that supplies the market would be able to do so most efficiently from a production cost standpoint (i.e., with the lowest unit costs). Figure 14-4 provides an example of the cost curves that would follow from a production technology that exhibits economies of scale and thus would yield a "natural monopoly": In this example there is an unavoidable (and sizable) fixed cost per period and constant marginal costs over all ranges of production. Since the fixed costs (by definition) do

[24] With respect to patents: There is a long and unfortunate legal history of describing all patents (and other forms of "intellectual property", such as copyrights and trademarks) as "monopolies". Since the U.S. alone currently issues almost 200,000 patents each year (and has issued over seven million patents since the beginning of the U.S. patent system in 1789), "monopoly" cannot be a useful descriptor for all patents. Instead, recognizing them as distinctive pieces of property – of which only some (probably only a relative few) each year are sufficiently distinctive that "monopoly" may be a useful descriptor for those patents – is a superior framework.

[25] This distinctive technology might be based on a specific patent; or it could be based on non-patented but not easily replicated "know how" or trade secrets.

[26] Economies of scale are conceptually distinct from the advantages of being able to exploit a "learning curve" (or "experience curve", or "learning by doing"). The former involves lower unit costs' being associated with higher volumes per period of time and are generally reversible; the latter involve lower unit costs that arise because of *accumulated* production volume over multiple time periods and is generally irreversible (unless the accumulated learning is somehow forgotten). Another way of thinking about the lower costs that occur as a consequence of a learning curve is that they are akin to the lower costs that arise as a consequence of technological innovation with respect to production processes.

not vary with output, the *average* fixed costs (AFC) are lower when volumes are higher (i.e., the fixed costs are "spread" over more units); and thus unit costs (or "average costs" [AC], which are the sum of the constant marginal costs[27] and the falling average fixed costs) are lower when volumes are higher.[28]

3. The size and "sunkenness" of needed investments. If entry into an activity requires a relatively large investment and that investment has no good alternative uses (i.e., the costs are "sunk"), then potential entrants would consider such entry to be quite risky. Examples of such investments include a large investment in specialized machinery; substantial research and development (R&D) expenditures that may not yield useful results; and large advertising and other promotional expenditures that are lost if unsuccessful. By contrast, if the necessary expenditure is modest in magnitude and, if spent on a tangible item, that item has a viable secondary market, the barriers to entry would be low. Monopoly would be more likely to arise in the former circumstance than in the latter.

The ability of the monopoly to exploit its market power (as measured by the Lerner index) would depend, as before, on the monopoly's costs and the elasticity of market demand but now also on the extent to which other firms are disadvantaged by these barriers (e.g., the extent of the cost disadvantage that a firm faces from the dis-economies of smaller scale if it tries to enter at a small scale) as well as (for small numbers strategic situations) the potential entrants' conjectures as to how the monopolist would react to their entry.[29]

F. Does a positive Lerner Index necessarily mean "market power"?

[27] Constant marginal costs, as portrayed in Figure 14-4 imply constant average variable costs of the same magnitude; and it is really the sum of average fixed costs and average variable costs that yield unit costs.
[28] Even if at some comparatively high volume the difficulties of managing a large enterprise might introduce dis-economies of scale, so long as the size of the market is smaller than that volume, a monopoly would still be the most efficient framework for that market.
[29] See, for example, Modigliani (1958) and Sylos-Labini (1962).

As was discussed above, the standard indicator of market power, at least by economists, has come to be the Lerner Index.[30] For the stylized examples that we have employed thus far, the Lerner Index would serve as a good guide for considerations of antitrust policy: The gadget monopolist (and the dominant firm) has a positive Lerner Index; the competitive industry (that is producing and selling commodity gadgets) would have a Lerner Index that is equal to zero.

However, a rigid use of the Lerner Index as an indicator of market power – and thus as an indicator of potential (likely?) antitrust concern – immediately becomes problematic when we move away from a simple world where all of the competitive firms in an industry are selling identical (homogeneous) commodity products; at best, this condition of homogeneity among sellers would roughly apply to sellers for primary agricultural and mineral commodities. Outside of these two areas, products (and services) tend to be non-homogeneous. With non-homogeneity, the product and the seller are distinctive: In deciding from which seller to buy which product, buyers care about more than just which seller has the lowest price. They care about the attributes of the product and of the seller.

The direct implication is that the demand curve that faces each distinctive seller has a negative slope (rather than being horizontal from the perspective of the competitive seller in an industry that is selling a homogeneous product, where only price matters to buyers). In turn, this will mean that the profit-maximizing output for the distinctive seller will be a level of output where $P > MR = MC$; and, thus, for this firm, $L > 0$: The Lerner Index indicates that the firm has market power. But if there are a large number of somewhat similar but still distinctive sellers that are competing with each other (with respect to price and with respect to other attributes) and/or entry by such firms (i.e., somewhat similar but still distinctive) is relatively easy, then the

[30] See, for example, Motta (2004, p. 41), Carlton and Perloff (2005), Perloff et al. (2007), and Tremblay and Tremblay (2012).

typical distinctive firm will earn only normal profits (despite the fact that P > MR = MC and thus L > 0). This outcome was first recognized separately and independently by Chamberlin (1933) and Robinson (1933): Chamberlin described the phenomenon as "monopolistic competition"; Robinson termed it "imperfect competition".

Chamberlin's geometry, which showed this result, is reproduced in modified form in Figure 14-5: The typical distinctive firm has a downward sloping demand curve, denoted as D (and a concomitant marginal revenue curve, denoted as MR), and a cost structure that exhibits economies of scale over at least part of its range of volume (in Figure 14-5, the cost structure of pervasive economies of scale from Figure 14-4 has been used). The figure shows the equilibrium conditions for the typical distinctive firm that faces competition from other distinctive firms: P = AC (the firm is earning normal profits); MR = MC (the firm is maximizing profits); and P > MR = MC (the Lerner Index is positive). If the typical firm were earning above-normal profits (i.e., P > AC), entry would occur, which would encroach on the firm's sales (i.e., its demand curve would shift down and to the left) and push it toward normal profits; if the firm were earning below-normal profits, some firms would exit, leaving more potential customers for the remaining firms (the typical firm's demand curve would move up and to the right) and again push it toward normal profits.

The landscapes of most market economies are dominated by myriad distinctive firms that produce and sell distinctive (branded) products and services – whether as manufacturers or as services providers or as retailers. Although there may be some definitional rigor to the attachment of the concept of "market power" to such firms, it makes little intuitive sense to identify the corner delicatessen or the neighborhood kitchen remodeler or a small machine shop

with the term "market power". To do so risks either trivializing the concept or – in the context of public policy – greatly overstating the realistic domain of public policy concerns.[31]

Consequently, unless otherwise noted, the remainder of this chapter will describe "market power" as applying to instances where the size of the enterprise is large enough to warrant special attention from public policy: i.e., "significant" market power.[32] We will thus remain in the traditional domain of "monopoly" and "dominant firm" that is associated with Figures 14-2 and 14-3.

III. Antitrust Policy with Respect to Monopoly and the Dominant Firm.

As was discussed in the Introduction, there are at least five ways that antitrust policy can limit the ability of an enterprise unilaterally to exercise market power. This section will discuss those policies. Before doing so, however, there is a threshold issue that must be addressed: market delineation.

A. A threshold issue: market delineation.

If "market power" is at issue in an antitrust proceeding, then generally there will need to be some specification of the "market" within which the "market power" has been or will be exercised. The exception is "hard core" price fixing and similar collusive arrangements that are prosecuted under Section 1 of the Sherman Act: These are treated as "per se" violations, in which the plaintiff need show only that the actions occurred and need not show effects (which

[31] See Pepall et al. (2008, pp. 53-54) for similar concerns over the use of the Lerner index as a mis-representation of "market power".

[32] This recognition that there must be some relative size threshold for realistic considerations of "market power" can also be found in Fisher (2008) and Baker (2008). It is possible, however, that even with a size threshold, a large firm with a positive Lerner index might be just a large-scale version of the Chamberlin-Robinson firm of Figure 14-5. Areeda and Hovenkamp (2002, p. 133) state that "Market power need not trouble the antitrust authorities unless it is both substantial in magnitude and durable." However, their subsequent discussion indicates that "magnitude" refers to the deviation between price and marginal cost, and not the size of the enterprise.

would likely require the specification of a market). In all other antitrust cases, a relevant market will need to be delineated.[33]

The needed specification of the market can arise in two broad contexts: a) A proposed action – e.g., a proposed merger – might threaten to create market power where it hadn't previously existed (or it could enhance/exacerbate market power that already exists); or b) An enterprise is accused of actions that are manifestations of its already existing market power. We will address each, in turn.

1. Market delineation to deal with a proposed action. Proposed mergers are the most common context in which the potential creation or enhancement of market power arises, and merger analysis will provide a convenient basis for the discussion of this approach to market delineation.[34]

The goal of antitrust merger enforcement is to prevent mergers that would create or enhance market power. The delineation of a relevant market – in product "space" and in geographic space – is essential for the analysis that should underlie merger enforcement decisions.

Since 1982[35] the U.S. Department of Justice's Antitrust Division (DOJ) and the Federal Trade Commission (FTC) have been using a set of "Merger Guidelines" (which have been updated periodically, the last such revision occurring in 2010) that have at their heart a market delineation paradigm that runs as follows: Suppose that the analyst starts with a "candidate" market that consists of (at least) the two firms that are proposing to merge. The analyst then addresses the following question: If all of the sellers of the candidate market were combined into

[33] Often this is described as "market definition".
[34] Since other chapters in this Handbook deal more extensively with merger policy, the discussion here will necessarily be brief.
[35] An earlier set of Merger Guidelines had been issued by the DOJ in 1968; however, the approach to market delineation those Guidelines did not prove satisfactory or lasting.

a single firm (a "hypothetical monopolist"), could that firm achieve a "small but significant and non-transitory increase in price" (SSNIP) above the current price (or above the level at which the price would otherwise be)? If the answer to this question is "yes", then this is a relevant market; if the answer is "no" (because too many buyers would turn to other sellers of the same or similar items, so as to thwart the attempt to raise the price), then the candidate market must be widened (by including more sellers) until the answer is "yes". Generally, the smallest relevant market will be the one that serves as the basis for further analysis of the merger. Price increases of 5% or 10% have usually been used as the measure of "significant" in SSNIP.

In essence, the paradigm rests on the idea that a relevant market is one in which market power could be exercised (by the "hypothetical monopolist").[36] Then subsequent stages of the analysis – by examining the market shares of the merging parties and of other major sellers in the relevant market, the change in market shares that would occur as a direct (pro forma) consequence of the merger; the conditions of entry; the buyers' side of the market; etc. – try to determine whether the merger that has been proposed is likely to result in the creation or enhancement of market power.

The market delineation paradigm that was just described was originally developed for the analysis of the possible creation of market power through (what is now described as) "coordinated effects"; earlier generations of economists would have described this as implicit "oligopolistic coordination". Thus, the merger analysis was focused on the prevention of the creation or enhancement of market power that would be jointly exercised by a group of oligopolists. Unless the relevant market happened to encompass just the two merging firms (and thus the merger was a "2-to-1" merger), it would not directly address the issue of the creation of

[36] Although this paradigm was first used in the DOJ 1982 Merger Guidelines, the concept appears to have first been developed by Adelman (1959b); see Werden (2003).

market power that could be exercised unilaterally. Nevertheless, the hypothetical monopolist paradigm is valuable for the purposes at hand for the following reason: If one thinks of the group of coordinating oligopolists as trying to emulate a monopolist, then the hypothetical monopolist provides an analytical basis for antitrust enforcement that can limit this emulation.

Since 1992, the Merger Guidelines have also encompassed an analytical approach to addressing problems of "unilateral effects": These problems arise when the two merging firms sell differentiated products that compete with each other. To the extent that there are customers of one of the firms that have considered the merger partner's products to be their best second choice, the merger eliminates the restraint that each firm exercised on the other firm's ability to raise prices. Thus, the merger will allow the merged firm unilaterally to raise its prices.[37]

In principle, a market delineation analysis is not needed for this approach. There only needs to be a finding (which would have to be based on solid empirical analysis) that significant unilateral effects would arise as a consequence of the merger. Or, if it were felt that there must be a delineation of a market for there to be a finding that the post-merger firm would be able to exercise greater market power, then (tautologically) the finding that the merged firm has the ability unilaterally to increase its price (if that increase exceeds a SSNIP threshold) must mean that the two prospective merger partners comprise a relevant market for that product.

2. Market delineation to assess whether a firm already posses market power. In a typical antitrust lawsuit in which a firm is being accused of actions that have monopolized or have attempted to monopolize an industry,[38] the plaintiff has to demonstrate that the defendant possesses market power; without the possession of market power, the defendant's actions would be unlikely to have significant consequences. Consequently, again, a relevant market must again

[37] More detail on this approach will be provided below.
[38] Recall that Section 2 of the Sherman Act does not forbid "monopoly"; instead it forbids actions that "monopolize, or attempt to monopolize…".

be delineated. Not surprisingly, the plaintiff will want to claim that the relevant market is narrow and that the defendant's sales constitute a large share of that market (and that entry is difficult, etc.), which would be a strong indicator that the defendant possessed market power; the defendant, of course, will want to claim the opposite: that the market is quite broad and that the defendant has only a small share (and that entry is easy, etc.) and doesn't/can't exercise market power.

A famous example of this type of issue arose in the antitrust suit by the DOJ against du Pont in the 1950s, alleging monopolization of cellophane.[39] The DOJ alleged that the relevant market was narrow: cellophane; du Pont claimed that the market was much broader and encompassed all flexible wrapping materials. More recently, in the DOJ's monopolization suit against Microsoft in the late 1990s[40] the DOJ argued that the relevant market was operating systems for Intel-compatible personal computers; Microsoft argued for a wider delineation that would have encompassed all software on all platforms for computing (including applications running on servers). Yet more recently, in the DOJ's antitrust suit against Visa and MasterCard in the early 2000s that alleged monopolization of credit card issuance,[41] the DOJ argued for a narrow market of credit and charge cards; Visa and MasterCard argued for a broader payments market that also included debit cards, checks, and cash.

Which perspectives were valid?

Unfortunately, the market delineation paradigm that works well for the Merger Guidelines approach to "coordinated effects" merger cases generally doesn't apply to such monopolization cases. The Merger Guidelines paradigm addresses a prospective merger and the

[39] See U.S. v. E.I. Du Pont de Nemours & Co., 351 U.S. 377 (1956); for discussion, see Stocking and Mueller (1955).
[40] See U.S. v. Microsoft Corp., 253 F.3d 34 (2001); for discussion, see, e.g., Rubinfeld (2009).
[41] See U.S. v. Visa U.S.A., Inc. Visa International Corp., and MasterCard International Inc., 344 F.3d 229 (2003); for discussion, see Pindyck (2009).

possibility that this prospective merger might create or enhance market power as a consequence of the completion of the merger.

By contrast, in the context of a monopolization case, the goal is usually to try to determine whether the defendant currently has market power. The use of the SSNIP test – asking whether the defendant could profitably raise its price from current levels – ought to be useless: If the firm is maximizing its profits, the answer ought always to be "no", regardless of whether the firm does or does not have market power. The defendant's current price should already be its profit-maximizing price; any increase above the current level should be unprofitable, even for a monopolist. [42,43]

If profits were considered to be a reliable indicator of the exercise of market power, they might help address the market power issue.[44] Recall that the monopolist of Figures 14-1, 14-2, and 14-3 is expected to earn above-normal profits, whereas the competitors in those figures, as well as the Chamberlin-Robinson competitor of Figure 14-5 is expected to earn only normal profits. But since the early 1980s most economists have been leery of the use of reported profit rates as evidence that can be used to measure the presence of market power;[45] and the use of

[42] Unfortunately, as White (2008) documents, the uselessness of the SSNIP test has not stopped judges in monopolization cases – and even some expert economists – from asking a SSNIP-type of question in these cases. In the du Pont cellophane case, the U.S. Supreme Court asked it, and the majority concluded that du Pont did not have market power because the company could not increase its price of cellophane profitably from current levels – that du Pont was too constrained by competition from other flexible wrapping materials. This inappropriate use of a SSNIP-type of question has since come to be known in antitrust discussions as the "cellophane fallacy".

[43] As Werden (2000) has pointed out, a SSNIP test would be appropriate if the issue that was under litigation was a prospective action (e.g., a proposed exclusionary action) by the defendant against which the plaintiff was seeking an anticipatory injunction. In that event, the question – "Will this action create (or add to the defendant's) market power?" – could be addressed by SSNIP: "After the proposed action occurs, would the defendant (unilaterally or in concert with other firms) be able to achieve a SSNIP?" But few monopolization cases involve prospective actions.

[44] In their commentary on the *du Pont* cellophane case, Stocking and Mueller (1955) demonstrate that du Pont's profits from selling cellophane were substantially higher than the company's profits from selling rayon, where du Pont faced considerably more direct competition; they argue that this indicates that du Pont was exercising market power and thus that cellophane, and not flexible wrapping materials, was the relevant market.

[45] For critiques of the use of profit data to indicate the presence of market power, see Fisher et al. (1983); Fisher and McGowan (1983); Benston (1985); and Fisher (1987). Carlton and Perloff (2005) and Perloff et al. (2007, ch. 2) offer eight reasons why accounting data on profits are inappropriate and misleading for cross-section studies that would try to reveal the presence of market power.

Lerner Indexes alone won't help, since both the monopolist of Figures 14-1, 14-2, and 14-3 and the Chamberlin-Robinson competitor of Figure 14-5 have Lerner Indexes that exceed 1.0.

Unfortunately, there have been no generally accepted market delineation paradigms for monopolization cases that would solve this conundrum.[46] The development of an appropriate paradigm remains as a serious need for antitrust policy and jurisprudence.

B. Antitrust policies to limit the unilateral exercise of market power.

As was mentioned in the Introduction, there are a least five ways that antitrust policy can limit the unilateral exercise of market power. We will now address these five.

1. Prevent/stop agreements among firms that restrict competition among them and that thereby allow the individual firms to continue to exercise unilateral market power. Agreements among firms that restrict competition among them are often described in terms of "price fixing": agreements to set the price collusively rather than allowing the competitive process and the market to determine the price. To the extent that the goal of the colluders is to approximate the monopoly outcome of Figure 14-2, the analysis that was developed earlier in this chapter is relevant.

However, since this chapter is focused on the unilateral exercise of market power, a different set of agreements will be addressed: market allocation agreements. These might also be

[46] White (2008a) offers some suggestions. Also, for some industries, where good price information is available and prices are known to vary for different localities (e.g., the retail prices for an item that is sold in many different metropolitan areas, or airline fares for many different city-pairs), empirical analyses – e.g., regression analyses where price (as the dependent variable) is regressed on a measure of seller concentration (as an indicator of the likelihood of the exercise of market power) and other control variables – may be able to establish that local markets for that item or service are relevant markets. Many airline fare studies have established local city pairs as relevant markets; see, for example, Borenstein (1989, 1992). When monopolization cases arise that involve airlines, city-pairs are usually accepted as the relevant markets; see, for example, Edlin and Farell (2004) and Elzinga and Mills (2009). Similarly, the FTC was able to establish (on the basis of price information) that "big box" office supply retailers in local metropolitan areas were a relevant market in its successful effort to stop the merger of Staples and Office Depot in 1997 (*FTC v. Staples, Inc.*, 970 F. Supp 1066 [1997]; for discussion, see, for example, Baker, 1999; Ashenfelter et al., 2006; and Dalkir and Warren-Boulton, 2009); this same kind of information could be used to establish the same relevant markets if (hypothetically) a big box office supply retailer were accused of exclusionary monopolistic behavior (e.g., of trying to buy all of the good retail sites in a metropolitan area, so as to restrict entry by rival big box office supply retailers).

described as "live and let live" arrangements: Firms A and B, which produce and sell similar products, agree to sell only within their own specified and separate geographic areas (or to their own specified and separate categories of customers) and not to challenge or encroach upon each other's territories or customer categories. If firms A and B are thereby the sole sellers within their territories (or to their customer categories), then the agreement achieves the monopoly outcome of Figure 14-2 for each firm, as compared with a more competitive outcome that would prevail in the absence of the agreement.[47]

Enforcement of the American antitrust laws has long recognized the anti-social nature of such market allocation arrangements, and judicial opinions have deemed them to be "per se" violations of Section 1 of the Sherman Act, which forbids "every contract, combination…, or conspiracy, in restraint of trade or commerce…"[48]

A recent manifestation of alleged non-compete agreements has arisen in the pharmaceuticals area. A stylized version of such an agreement is as follows:[49] Branded pharmaceutical Company I (for "incumbent") has a patent on an important drug that expires in, say, 2015; after that date generic versions of that drug can be sold. In 2011 generic pharmaceutical Company E (for "entrant") believes that Company I's patent is invalid and files an application with the U.S. Food and Drug Administration to sell a generic version of the drug. Company I sues Company E for patent infringement. Instead of going to trial, the two companies settle the suit on the following terms: Company E agrees to delay its sale of the

[47] If the two firms produce identical products and would otherwise compete directly on price without any effort to behave strategically (i.e., they are "Bertrand" competitors), then the competitive outcome would be that shown in Figure 14-2 as well.

[48] Arguably, the first Supreme Court condemnation of such horizontal allocation arrangements (as opposed to specific price-fixing agreements) came in *Addyston Pipe & Steel Co. v. U.S.*, 175 U.S. 211 (1899). In that case, the manufacturers of pipe agreed not to compete with each other in bidding for municipal contracts. The Court's condemnation of such horizontal non-compete arrangements has been periodically reaffirmed; e.g., in *U.S. v. National Lead Co.*, 332 U.S. 319 (1947); and in *U.S. v. Topco Associates, Inc.*, 405 U.S. 596 (1972).

[49] This version will exclude a great deal of institutional detail. For a more comprehensive analysis of these issues, see, for example, Bigelow and Willig (2009).

generic version until 2013; Company I agrees that it will not challenge Company E at that time and agrees to make a payment of $X million to Company E.

This kind of agreement certainly has the potential to preserve the market power of Company I. If a patent were not involved and this was simply a payment from I to E to delay E's entry into I's market, the agreement would almost surely be condemned as a per se violation of the Sherman Act. Because I's profits as a sole seller (monopolist) will always exceed the joint profits of the two firms selling in the market (and at the limit, the comparison of profits is the monopoly/competition comparison of Figure 14-2), Company I can afford to offer a substantial payment to E for delay, and both companies would be better off than if E entered immediately. But consumers would be worse off.

However, because a patent is involved and the true validity of the patent is a central but unknown feature of the agreement and because the courts have generally viewed settlements of lawsuits as a beneficial activity that represents a mutually agreed outcome that also economizes on judicial resources, the courts have generally not been hostile to these agreements, despite repeated challenges to these agreements by the FTC and by private plaintiffs. Further, there are circumstances – related to the uncertainties that surround the validity of the patent, as well as uncertainties as to how long a trial would take and how much the litigation costs would be – where a "reverse payment"[50] settlement can even make consumers better off as compared with the likely outcome in the absence of the settlement.[51]

In the summer of 2012 the Third Circuit Court of Appeals, in a suit by private plaintiffs that challenged one such agreement, broke with a number of other circuit courts and agreed with

[50] Because plaintiffs do not usually make payments to defendants to settle lawsuits, these types of settlements have come to be known as "reverse payments".
[51] See Bigelow and Willig (2009) for an elaboration of this argument.

the plaintiffs.[52] The difference of opinions among the circuits for a major category of antitrust suit may well cause the Supreme Court to decide that the time is ripe to grant an appeal and establish a clear approach to these kinds of suits.

2. Prevent/stop mergers that would otherwise allow the merged firm to exercise market power or to enhance existing market power. Since 1914 Section 7 of the Clayton Act has empowered the FTC and the DOJ to stop mergers where "in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or tend to create a monopoly." As originally written, the Act stopped only mergers that were consummated through the acquisition of shares of stock of one company by the other; this left a huge loophole in the form of one company's direct purchase of the other company's assets (including its brand name). This loophole was closed in 1950 by the Celler-Kefauver Amendments to the Clayton Act.

As was discussed above, the economic analysis of the possible anticompetitive consequences of mergers has focused on two routes: "coordinated effects", whereby the merger would allow greater oligopolistic coordination among rivals; and "unilateral effects", whereby the merging firms sell competing differentiated products and there are significant numbers of customers of either of the merging firms that consider the products of the other firm to be their second choice. In this latter case, the merged firm would have an incentive to raise its prices (as compared with pre-merger prices), since its partner would no longer be an independent restraint.

This latter price-raising effect is clearest if the firm were able to identify which are the "trapped" customers that meet this condition; it could then practice price discrimination toward

[52] See *In re K-Dur Antitrust Litigation*, 2012-2 CCH Trade Cases ¶77,971 (July 16, 2012)

those customers and just raise its prices toward those customers.[53] But the incentive to raise prices holds generally, even when price discrimination is not possible. The strength of the "upward pricing pressure" (UPP)[54] depends on the extent to which the merged firm is able to recapture the customers that the pre-merger firms would have otherwise lost from a price increase and the profit margins on the "companion" product to which those customers are diverted. Any cost-reduction efficiencies that would accompany the merger and that would reduce marginal costs would offset those demand-driven upward pricing pressures, yielding a net UPP.[55]

Finally, although a unilateral effects analysis that reveals that a significant net UPP would arise from a proposed merger may not track exactly the competition/monopoly comparison of Figure 14-2, it is clearly in the same spirit: For the customers of the merged firm, the merger would be accompanied by a significant increase in prices, which would be the manifestation of the merged firm's increased market power (and that increase in market power would, of course, be registered by a higher Lerner Index for the merged firm).

3. Prevent/stop predatory behavior by a firm that can enhance its market power by driving rivals out of the market. A potential strategy for a firm (the "incumbent") that wants to achieve a monopoly position would be to set its prices temporarily at such low levels that all of its rivals are permanently driven from the market; the firm could then raise its prices to the

[53] Of course, in addition to identifying those "trapped" customers, the firm would also have to prevent arbitrage between other (low-price) customers and these high-price customers and deal with the customer unhappiness that would arise when the discriminated-against customers learn that they are paying higher prices than are other customers.
[54] This is the phrase that Farell and Shapiro (2010) have popularized
[55] Also, to the extent that entry would occur in response to the net UPP or other competing firms would reposition their products so as to attract some of these "trapped" customers, the net UPP would be smaller.

monopoly level that is represented in Figure 14-2. Such a strategy is typically described as "predatory pricing".[56]

The strategy is best described in terms of a necessary "investment" and then a subsequent "return" or "recoupment": The investment is the reduced profits (or actual losses) that the incumbent incurs while it is charging the low prices that will drive its rivals from the market; the return is the larger profits that the incumbent earns after the rivals have exited the market. Thus, as is true for the evaluation of any investment, the size of the investment and the size of the return must be calculated; and, because the return occurs at a later time than the investment, a discount rate must be used.

Finally, it is crucial that the rivals be <u>permanently</u> driven from the market. If instead entry is easy, and potential entrants are not deterred by the possibility that the firm might again aggressively try to drive them from the market – perhaps because the entrants are myopic, or because they are strategic and believe that the incumbent can be deterred by an equal determination by the entrants to stay in the market – then there will be little or no return or recoupment. On the other hand, if the firm can establish a reputation for being aggressive, then this may deter potential future entrants; or – in the case of a firm that is selling multiple products in multiple markets – deter potential entrants in other markets.[57]

Public policy and judicial decisions with respect to predatory pricing have varied over the decades. From the 1930s through the 1960s, a populist theme had a major influence on antitrust:

[56] This discussion will focus on predatory pricing; but, in principle, other activities by the incumbent – excessive advertising or promotion, or flooding the market with capacity, or buying crucial resources in excess of reasonable needs – could fit the "predatory" pattern. For a failed effort by the DOJ to prosecute an instance of alleged predatory flooding of capacity by an incumbent airline, see *U.S. v. AMR Corp.*, 335 F.3d 1109 (2003); for an economics discussion of this case, see, for example, Edlin and Farrell (2004). In addition, the exclusionary actions that are discussed in the following section could also be interpreted through a "predatory" lens.

[57] See, for example, Bolton et al. (2000). Further, even if a reputation for aggressive behavior doesn't deter entrants, to the extent that a firm faces strategic rivals in one or more markets, its reputation for being willing to be aggressive may serve to discipline those rivals and restrain them from competitive initiatives.

Large firms should be discouraged, regardless of efficiencies; and small firms should be preserved – partly for their own sake (the populist theme) and partly be cause of fears that large firms would drive out small firms and then be able to impose monopoly pricing (the predation scenario). During the 1930s amendments to the antitrust laws strengthened the Clayton Act Section 2 restrictions on price discrimination (this became known as the Robinson-Patman Act of 1936) and amended the Sherman Act to allow the states to authorize resale price maintenance (through the Miller-Tydings Act of 1937). In the former case, the intent was to prevent large retailers (the "chain stores") from obtaining better wholesale prices from manufacturers than could smaller retailers; and in the latter case, the intent was to prevent the large retailers from selling at lower prices than could smaller retailers.[58] Antitrust judicial decisions reflected these policy trends.[59]

Beginning in the 1970s, however, the populist streak in antitrust receded, and an emphasis on encouraging competition and limiting the exercise of market power became stronger.[60] There was still a concern that predatory pricing could undo competition and create a monopoly. But there was also a stronger concern that inhibitions on aggressive pricing would simply inhibit vigorous competition, to the detriment of consumers.[61] Reinforcing this concern was the realization that many judicial (and regulatory) determinations of what was "below cost" pricing included (for multi-product firms) arbitrary allocations of fixed and overhead costs into

[58] Simultaneously, economic regulation was broadened, so as to restrict competition in interstate trucking, airlines, and banking, and restrictions on competition in railroads were strengthened. And for a brief period – 1933-1935 – the Sherman Act's prohibition on price fixing was effectively suspended, as the National Recovery Administration (NRA), which was authorized by the National Industrial Recovery Act of 1933, negotiated and enforced codes of "fair competition" for industries, which effectively encouraged price fixing. A Supreme Court decision that declared the NRA to be unconstitutional (*Schechter Poultry Corp. v. U.S.*, 295 U.S. 495 [1935]) ended this "experiment".

[59] See, for example, *Utah Pie Co. v. Continental Baking Co.* 386 U.S. 685 (1967); see also Adelman (1959a) and Levinson (2011).

[60] And, simultaneously, there was greater emphasis on deregulation and an encouragement of greater competition in airlines, trucking, rail, and banking.

[61] This has come to be known as the problem of "Type I errors": the condemnation (as "predatory") of pricing that is simply vigorous but competitive.

the unit costs that were the standard for which lower prices indicated predation. The so-called "Areeda-Turner rule",[62] which established prices that are equal to or greater than marginal costs (with average variable costs serving as a proxy for marginal costs) as a "safe harbor" against charges of predation, provided important guidance for policy and for the judiciary.[63,64]

Starting in the 1980s, Supreme Court decisions have taken an increasingly skeptical view of the likelihood of successful predation.[65] However, what has been missing from those decisions, as well as from lower court decisions, is the recognition that (as was discussed above) the extra benefits of the acquisition of a reputation for being aggressive may make worthwhile an episode of predatory pricing that otherwise appears to lack a positive investment/return profile (and that is thereby likely to be dismissed as merely vigorously competitive, rather than as potentially predatory).[66]

4. Prevent/stop exclusionary behavior by a firm that can enhance its market power. All enterprises rely on "upstream' suppliers to provide them with some of their inputs; and all but end-of-the-chain retailers sell to "downstream" customer firms.[67] Vertical integration by a firm

[62] See Areeda and Turner (1975).
[63] Parallel efforts were being made in the regulatory arena to move pricing decisions away from "fully distributed costs" and toward "incremental costs"; see, for example, Baumol (1968) and Baumol and Walton (1973).
[64] The Areeda-Turner rule is clearly conservative, as a reference to Figure 14-3 demonstrates: By pricing at the level of P_L, the dominant firm eliminates profitable production by the fringe, even though P_L is above the dominant firm's marginal costs. If this could make the fringe disappear permanently, then the dominant firm would have the entire market to itself, even though it would not have violated the Areeda-Turner rule.
[65] See *Matsushita Electric Industrial Corp., Ltd., et al. v. Zenith Radio Corp. et al.*, 475 U.S. 574 (1986); *Brooke Group, Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209 (1993); and *Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co., Inc.* 549 U.S. 312 (2007). For economics commentary on each, see, for example, Elzinga (1999), Burnett (1999), and Rausser and Foote (forthcoming, 2014), respectively. For a case in which the plaintiff convinced an appellate court of the existence of predation, see *Spirit Airlines Inc. v. Northwest Airlines Inc.*, 431 F.3d 917 (2005); for an economics discussion of this case, see, for example, Elzinga and Mills (2009).
[66] Another approach that may well be worth considering is embodied in the concept of "no economic sense": that a price or non-price action should be condemned if it made no economic sense for the firm that was undertaking the action unless the target firm (or firms) disappeared from the market or was otherwise disciplined. See Ordover and Willig (1981, 1999) and Werden (2006).
[67] In the case of firms that produce and then sell finished goods to or through "distributors" (whether wholesale or retail), the particular legal arrangement with respect to who owns the goods at which stage can affect whether one would consider the distributor to be "downstream" from the producer, or whether the producer is purchasing

at one stage into an upstream or downstream stage may bring socially beneficial efficiencies in exploiting production efficiencies and/or overcoming externality problems or informational asymmetries; or a firm that lacks the managerial or production capabilities to integrate vertically into an adjoining stage may still be able to overcome the externalities or asymmetries through vertical contracting practices.[68]

However, a firm that enjoys market power at one stage may also be able to use vertical integration or vertical contracting practices to enhance its market power – essentially by restricting and/or raising the cost to rivals of access to upstream or downstream resources.[69] By raising costs to rivals, a firm is able to deflect demand to itself and thereby increase its prices and its profitability. Recall that the dominant firm in Figure 14-3 benefits from actions that cause the fringe firms' supply curve to shift upward.

The courts – supported by many economists' suspicions about anticompetitive nature of vertical restraints – initially approached vertical restraints and even vertical integration via merger with substantial hostility.[70] At various times, resale price maintenance, territorial exclusivity, exclusive dealing, and tying were branded as "per se" offenses. However, starting in the 1970s, the courts have taken a more nuanced view toward vertical restraints, recognizing their potential efficiencies and essentially judging them under a "rule of reason".[71] However, a

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"distribution services" from the distributors, which would make them (at least conceptually) "upstream" from the producer.

[68] Examples of such practices include resale price maintenance (RPM), territorial exclusivity, exclusive dealing, exclusive dealers, full-line forcing, tying, and bundling. Often, these vertical contracting practices (or vertical integration) are beneficial in dealing with free-riding problems. This is the argument that is often advanced to support resale price maintenance (see, e.g., Telser, 1960), territorial exclusivity, and exclusive dealing (see, e.g., Marvel, 1982).

[69] As Asker and Bar-Isaac (2011) demonstrate, RPM can be seen as an effort by the incumbent to "bribe" its distributors to refrain from distributing a rival's products.

[70] The story of the initial legal and economics hostility to vertical practices, and the eventual softening, is recounted in White (1989, 2010a, 2010b).

[71] An important early decision was *Continental T.V., Inc., et al. v. GTE-Sylvania Inc.*, 433 U.S. 36 (1977); for an economics discussion of this case, see, for example, Preston (1994). The most recent major movement in this direction came in the Supreme Court's decision in 2007 to treat RPM under the rule of reason, in *Leegin Creative*

rule of reason approach does not mean that the defendant always carries the day with efficiency arguments, see, for example, *U.S. v. Visa USA Inc., Visa International Corp., and MasterCard International Inc.*, 344 F.3d 229 (2003);[72] and *U.S. v. Dentsply International, Inc.*, 399 F.3d 181 (2005).[73]

(5) Structural dismemberment. If a firm is found to be exercising market power – because it is found to have a positive Lerner Index (and thus is charging P > MC) and/or it has engaged in predatory/exclusionary acts – then one way to limit that exercise of market power is to dismember the firm: to break the firm into two or more horizontal (and viable) competitors or two or more vertically related entities (if vertical exclusionary acts are seen as the problem). This dismemberment route was the approach that the Supreme Court adopted in 1911 to DOJ monopolization prosecutions of the Standard Oil Company of New Jersey (in *Standard Oil Co. of New Jersey v. U.S.*, 221 U.S. 1 [1911]) and the American Tobacco Company (in *U.S. v. American Tobacco Co.*, 221 U.S. 106 [1911]). In the decade that followed the DOJ succeeded in breaking up other large industrial firms that had large market shares and that appeared to be exercising market power.

By 1920, however, the Supreme Court backed away from this approach, refusing to find that the U.S. Steel Corporation was guilty of monopolization (in *U.S. v. U.S. Steel Corp.*, 251 U.S. 417 [1920]), and for the next two decades the dismemberment approach to addressing market power was largely abandoned.

Leather Products, Inc. v. PSKS, Inc. 581 U.S. 677 (2007). For an economics discussion of this case, see Elzinga and Mills (2014 forthcoming). Tying remains technically a per se offense; but, by insisting that a defendant possess market power before a tying prosecution can succeed, the Supreme Court has greatly weakened the sting of the apparent per se status of tying. See, for example, *Jefferson Parish Hospital District No. 2 v. Hyde*, 466 U.S. 2 (1984); for an economics discussion of that case, see, for example, Lynk (1999).

[72] For an economics discussion of this case, see, for example, Pindyck (2009).

[73] For an economics discussion of this case, see, for example, Katz (2009).

In the 1940s through the 1960s, however, prosecutorial and judicial interest in this approach was revived. The DOJ's successful prosecutions of Alcoa (in *U.S. v. Aluminum Co. of America*, 148 F.2d 416 [1945]), of movie chains and distributors (in *U.S. v. Crescent Amusement Co.*, 323 U.S. 173 [1944]; *U.S. v. Griffith*, 334 U.S. 100 [1948]; and *U.S. v. Paramount Pictures, Inc.* 334 U.S. 131 [1948]), of the United Shoe Machinery Corporation (in *U.S. v. United Shoe Machinery Corp.*, 347 U.S. 521 [1954]),[74] and the Grinnel Corporation (in *U.S. v. Grinnel Corp.*, 384 U.S. 563 [1966] all resulted in some divestitures of either a horizontal or vertical nature; for example, in *Alcoa*, the DOJ succeeded in requiring that Alcoa divest its Canadian subsidiary, Aluminium Ltd., which became an independent competitor to Alcoa.

Simultaneous with this revived prosecutorial and judicial interest in the dismemberment approach to monopolization problems was a rising academic/intellectual interest in this approach, which peaked in 1959 with the publication of a pro-dismemberment monograph by Kaysen and Turner (1959). The Kaysen and Turner intellectual argument for a "no fault" approach to the dismemberment of firms that were exercising market power (which included oligopolies, as well as monopolies and dominant firms) rested on the findings of Bain (1951, 1956), who showed that corporate profits (and thus the exercise of market power) were positively related to seller concentration (Bain, 1951)[75] and that economies of scale were relatively unimportant in explaining the sizes of large oligopolistic firms (Bain, 1956). Also, an important argument for a structural approach was (and remains) that it is largely self-enforcing: Whereas a behavioral remedy requires enforcement by a federal district court judge, a successful structural remedy (i.e., if the additional competitors that are created by the structural remedy are

[74] For an economics discussion of this case, see Kaysen (1956).
[75] Bain's findings were replicated many times, with increasingly sophisticated econometrics, over the next two decades. For summaries of these many studies, as of the early 1970s, see Weiss (1971, 1974).

economically viable) creates the improved competitive conditions that limit the exercise of market power.

By the 1970s and 1980s, however, many economists' faith in the linkage between corporate profits as an indicator of the exercise of market power and seller concentration was substantially weakened,[76] as was the belief that economies of scale were unimportant for explaining the size and profitability of major industrial firms.[77] There was still evidence, based on price data (instead of profit data), that seller concentration and the exercise of market power were still positively associated.[78] Still, the intellectual force that might have continued to sustain the dismemberment approach was clearly weakened.

One final major dismemberment was achieved by the DOJ, in a settlement of a monopolization case against AT&T in 1982.[79] In this case, the DOJ's argument that AT&T's ownership of (regulated) local wire-line telephone service, long distance service, and telephone equipment manufacturing facilities made it difficult for rivals to enter and compete in the latter two areas carried the day, and the local operating companies were separated from the long distance and equipment facilities (and the local operating companies themselves were separated into seven regional companies, so as to reduce the possibility of monopsony power in their purchases of telephone equipment).

In the 1990s, when the DOJ prosecuted Microsoft for monopolization and initially won its case at the federal district court level, it asked for and got the court to agree to the vertical dismemberment of Microsoft into an operating system (OS) company and a browser-plus-

[76] As was discussed, above, during this period substantial doubts were raised about the validity of reported corporate profits as an indicator of true "economic profits" and thus as an indicator of the exercise of market power. In addition, critics raised the possibility that the higher profits that were associated with greater seller concentration were the result of economies of scale; see, for example, Demsetz (1973, 1974) and Mancke (1974).
[77] See, for example, Demsetz (1973, 1974) and Mancke (1974).
[78] See, for example, Weiss (1989) and Audretsch and Siegfried (1992).
[79] See *U.S. v. AT&T*, 552 F. Supp. 131 (1982); for an economics discussion of this case, see, for example, Noll and Owen (1994).

software-applications company;[80] the theory/hope was that the OS company would vertically integrate into browsers and applications, while the browser company would vertically integrate into Oss, and thus competition in both areas would increase. However, when the case was appealed, the appellate court – though supporting the DOJ's claim that Microsoft had engaged in monopolization – refused to endorse the dismemberment remedy and remanded the case back to the district court for further consideration of a remedy.[81] The case was finally settled with only behavioral remedies and no dismemberment.[82]

It seems unlikely that, in the absence of a major change in antitrust economics and legal sentiment, there will be any further calls for dismemberment in future monopolization cases brought by the DOJ.

IV. Conclusion.

Monopoly and the dominant firm continue to be an important and interesting area for antitrust policy and jurisprudence, as well as for antitrust economics. Although the basic concepts of monopoly and the exercise of market power are clear – at least in antitrust economics – the identification of monopoly and the issue of what to do about it when it is identified remain as contentious issues. Especially troubling is the absence of a clearly developed paradigm for the delineation of a market in most monopolization cases; without a paradigm, plaintiffs will always argue for arbitrarily narrow markets, defendants will argue for arbitrarily broad markets, and the judiciary will have little basis for choosing among arbitrary alternatives. Further, the separation of hard-nosed, vigorous competition with respect to price and other attributes from predatory

[80] See *U.S. v. Microsoft Corp.*, 84 F. Supp. 2d 9 (1999); 87 F. Supp. 2d 30 (2000); and 97 F. Supp. 2d 59 (2000).
[81] See *U.S. v. Microsoft Corp.*, 253 F.3d 34 (2001).
[82] See *U.S. v. Microsoft Corp.*, 231 F. Supp. 2d 144 (2002). For an economics discussion of this case, see, for example, Rubinfeld (2009).

behavior, and the tradeoffs between the greater efficiencies that can be brought by vertical restraints and the exclusionary effects of those restraints, will remain as contentious issues for antitrust economics and jurisprudence.

In sum, monopoly and the dominant firm remain as an interesting area for antitrust.

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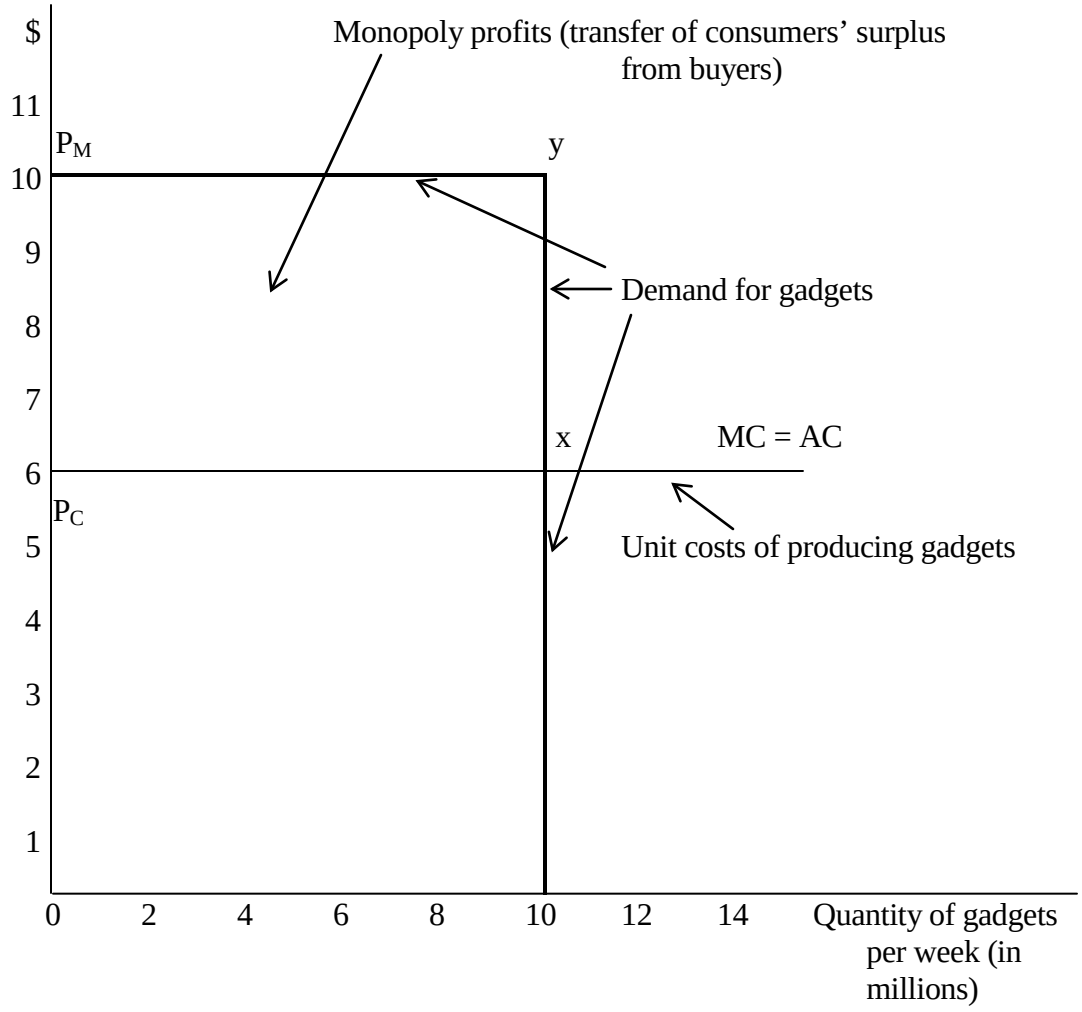
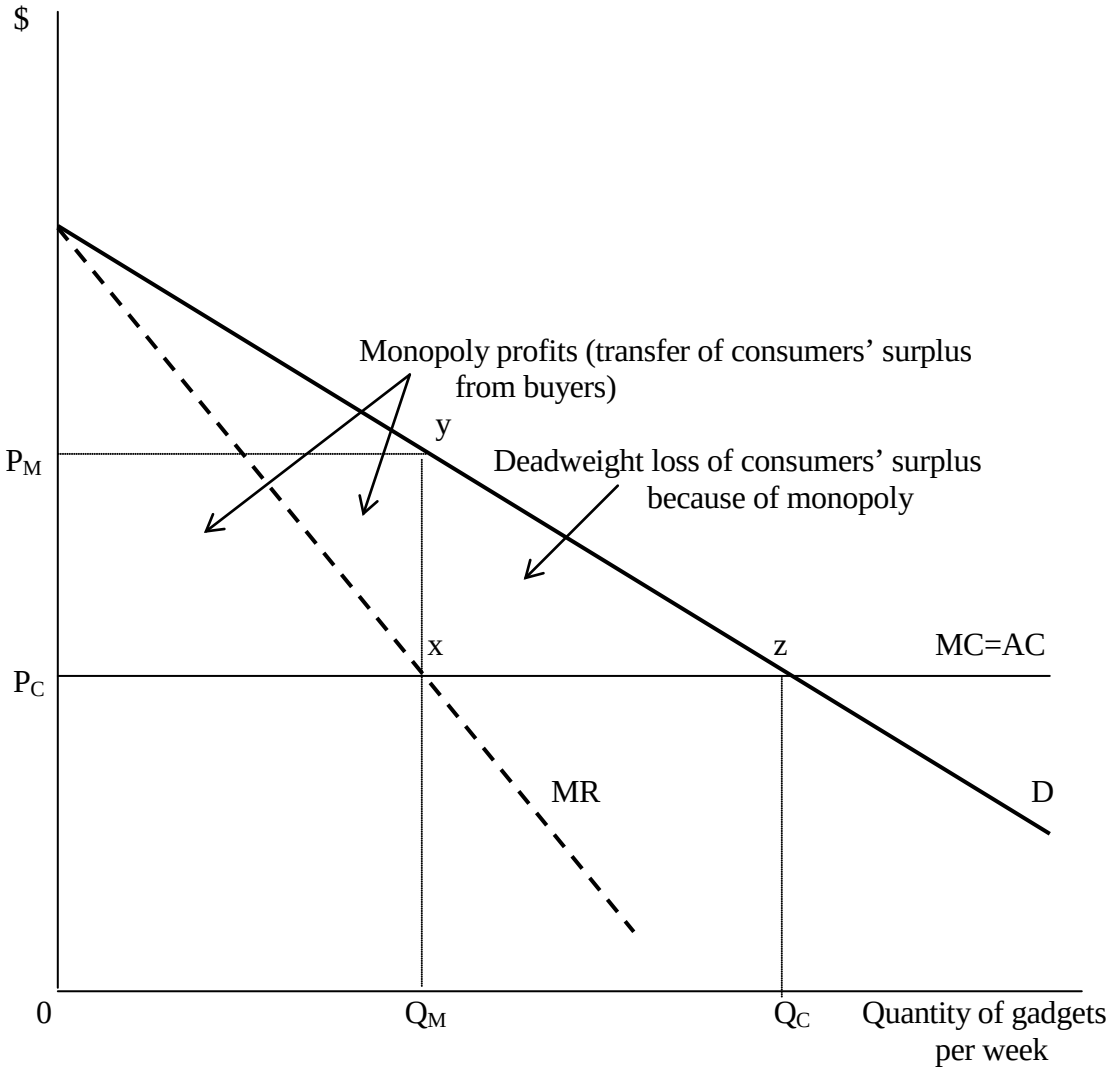
Figure 14-1: A Simple Comparison of Monopoly and Competition



P_M: monopoly price

P_C: competitive price

Figure 14.2: A More Complex Comparison of Monopoly and Competition



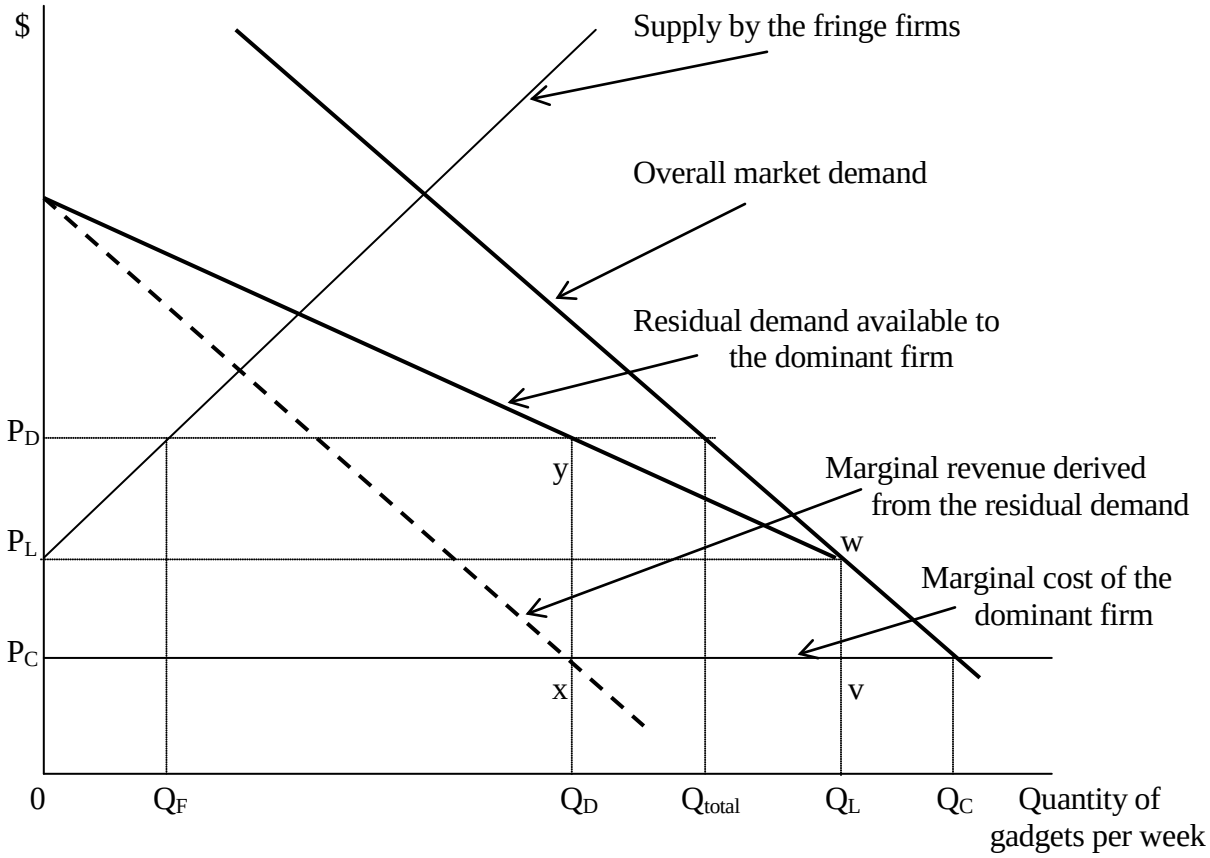
P_M: monopoly price

Q_M: monopoly quantity that is produced/sold

P_C: competitive price

Q_C: competitive quantity that is produced/sold

Figure 14.3: The Dominant Firm and the Reactive Fringe



P_D: price of gadgets sold by the dominant firm and by the reactive fringe firms

Q_F: quantity of gadgets sold by the reactive fringe firms

Q_D: quantity of gadgets sold by the dominant firm

Q_{total}: quantity of gadgets sold by the aggregate of the reactive fringe plus the dominant firm

P_L: price of gadgets if the dominant firm chooses to price at the level that just excludes the most efficient of the fringe firms

Q_L: quantity of gadgets sold at a price of P_L

P_C: competitive price (if superior technology is available to all)

Q_C: quantity of gadgets sold by the competitive industry

Figure 14-4: The Cost Curves for a Technology That Has Economies of Scale

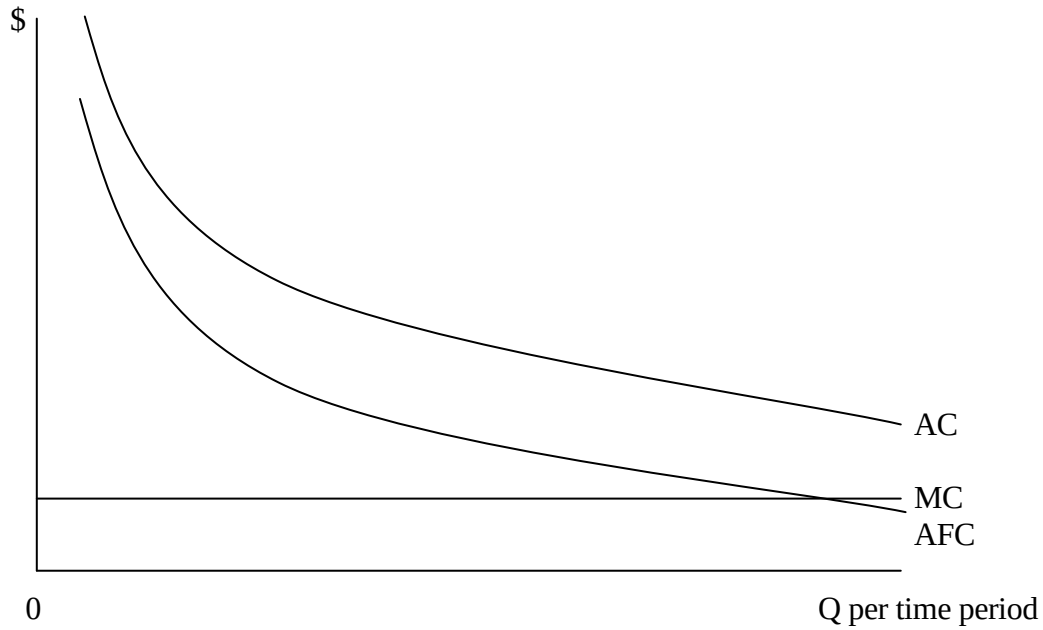
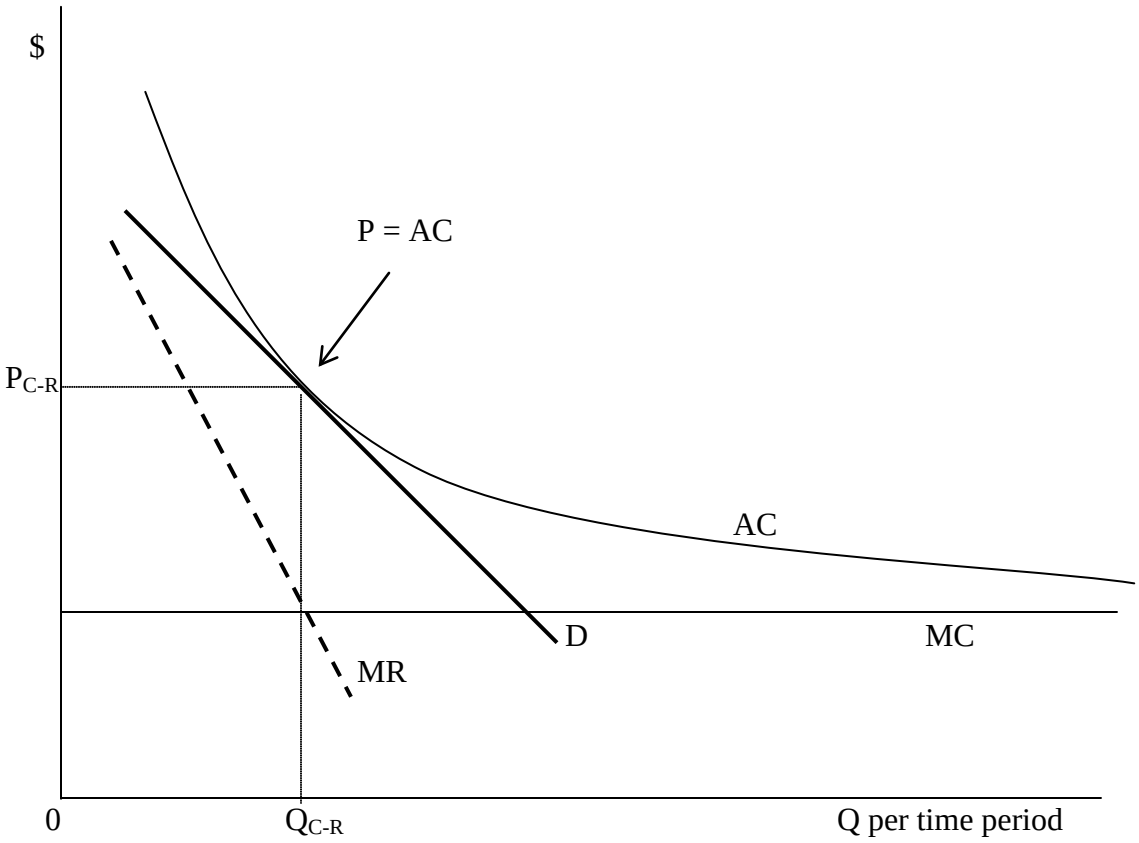


Figure 14.5: The "Tangency" Equilibrium for a Chamberlin-Robinson Competitor



P_{C-R}: price charged by a Chamberlin-Robinson seller

Q_{C-R}: quantity produced/sold by a Chamberlin-Robinson seller