

CHAPTER 2

THE ECONOMIC ANALYTIC FRAMEWORK

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The economic analysis of the competitive effects of market conduct antitrust law has is based on a simple idea: competition is good and market power is bad. The goal of antitrust law is to interdict and deter (anticompetitive) conduct that harms consumers, workers, and suppliers by allowing a firm (or group of firms) to achieve, maintain, or exercise market power. At the same time, the law has the companion goal of permitting and encouraging (procompetitive) conduct that benefits these participants and leads to efficient and innovative economic markets.

Market power can be achieved, enhanced, or maintained by a group of firms acting in concert to eliminate competition among themselves. It can also arise from a single firm taking actions to deny competitors' access to critical inputs or customers its rivals need to compete efficiently. But market power can also arise from a single firm or group of firms acting in concert and engaging in conduct that reduces their costs, raises the quality of their product, or increases their investments and innovation. The goal of antitrust law is to set standards that encourage the latter while discouraging the former.

This monograph explains the economics behind the goals of antitrust law to interdict and deter harmful anticompetitive conduct. It shows how economic analysis—which seeks to determine how likely it is that market restraints artificially raise or maintain market power and how and why it would be profitable for firms to engage in the challenged conduct—can deepen and enrich lawyers' understanding of anticompetitive conduct.

This chapter sets out the economic framework typically applied to antitrust legal analysis. That framework involves the basic concepts of market competition, market power, and entry barriers, and the distinction between procompetitive and anticompetitive conduct and effects. It draws a distinction between collusive and exclusionary anticompetitive conduct. The annex provides a technical discussion of the concepts and analysis.

I. The Market Economy

Most of the world's economies are based on decentralized markets rather than full command and control by a central authority. In a market economy, buyers and sellers transact to exchange products at a price. These exchanges allow individuals to improve their welfare and obviate the need for each person to be self-sufficient in production, a process that would be highly inefficient.

Market prices have an important informational function. They transmit information to consumers about the relative cost of different items, allowing them to allocate their budgets across products to purchase them in a rational way. They transmit information to sellers about the value buyers place on items, which can lead sellers to produce more of the items that are valued in excess of the seller's cost of production. Markets provide this information for free, obviating the need for a vast bureaucracy to oversee the production, purchase of inputs for, and prices of these products.¹

¹ Setting prices that properly allocate products is difficult. When governments do so, fixed prices often lead to shortages or excess inventories. Price controls can have a place in a market economy (most countries have minimum wage laws), but their effect is not straightforward. On the one hand, they can countervail the employment-reducing monopsony power of employers, leading to higher employment and raising worker income. On the other hand, they can reduce the demand for labor, cutting employment. There has been significant evolution among economists. Economists traditionally believed that the minimum wage harmed employment. However, well designed recent empirical studies have shown that the minimum wage generally increases employment in concentrated markets or has only very small negative employment effects. For discussion of the seminal study of fast food workers by Card and Krueger, see David Card and Alan B. Krueger, *MYTH AND MEASUREMENT: THE NEW ECONOMICS OF THE MINIMUM WAGE* (1995). See also Arindajit Dube and Ben Zipperer, *Own-Wage Elasticity: Quantifying the Impact of Minimum Wages on Employment*, NBER Working Paper (September 2024), https://www.nber.org/system/files/working_papers/w32925/w32925.pdf.

A. The Panoply of Markets and Market Structures

A modern market economy consists of many different types of markets. There are markets for the economy's building blocks, such as land, natural resources, physical and intellectual labor, finance, and so on. These building blocks are used as inputs to produce outputs, which are then divided into products and services. (For simplicity, they are referred to hereafter as *products*.) These inputs and outputs can be either physical products, digital products, or services; they can be used for either consumption or investment. The market for a given product may be further differentiated by geography. One can also distinguish between retail markets (in which purchases are made for consumption) and wholesale markets (in which products are purchased as inputs to produce other products or for resale).

Markets can be structurally distinguished by conditions that affect the intensity of competition among sellers or buyers. At one end of the spectrum are *perfectly competitive* markets. An idealized perfectly competitive market on the sell-side features many small sellers of a homogeneous product, easy entry, and buyers who are well informed about the prices being charged. These markets involve a high degree of competition because purchasers face many choices and each seller is too small to exert any influence over prices (if one seller charges more than others, it will not be able to sell any output at all). The only way in which sellers in these markets can achieve any power over price is through collective action. In many cases, such action leads to regulation that restricts their competition. In some cases—agricultural cooperatives, labor unions, Major League Baseball—antitrust exemptions have been created that permit them to achieve and exercise market power.

If the products sold are differentiated or the production process limits the number of firms, each seller can have some market power to affect prices. Where production conditions and consumer preferences create room for a substantial number of sellers and entry by new firms and products is easy, the market for such products is termed *monopolistically competitive*. Examples of such markets are restaurants, apparel, and law firms. Thanks to their differentiation, these firms have a modest amount of power to control prices. This power does not normally raise antitrust concerns, although mergers between such firms reduce competition within a niche market. Such firms may also attempt to push for regulations that lead to harmful competitive results.

Antitrust has a greater role to play in *oligopoly markets*—markets with a small number of competitors and barriers to entry. An oligopoly market may arise when the number of firms is limited by a production process with high entry or recurring fixed costs relative to the demand for the products, a high degree of product differentiation, or some combination of both. The behavior of oligopolists and the competitiveness and economic performance of oligopoly markets depend on numerous factors related to the firms' technology, customer demand, and information.

A small number of sellers increases the chance that each seller will have some degree of power over price. Examples of oligopoly markets include airlines; farm input products, such as chemicals and seeds; and wireless phone services. In a market with a small number of sellers, firms have the ability and incentive to make decisions that take account of the likely responses of their rivals, possibly

allowing them to avoid a type of prisoner's dilemma game in which each player's individual response would not lead to higher prices and profits but collective action would.

Buyer-side markets can also be oligopolistic. Market power and monopoly power by buyers are called *monopsony* power.² Companies that purchase meat, chicken, and eggs at scale; large health insurers that contract with doctors and hospitals; and local hospitals that purchase labor services from nurses and medical technicians all have oligopolistic characteristics and may involve significant monopsony power.

Antitrust concerns are most prevalent in oligopoly and *dominant-firm markets* (markets in which a leading participant has a large market share). Antitrust refers to these dominant firms as monopolists even if they have some smaller competitors if potential entrants face barriers to entry that support the existence of market or monopoly power. In oligopoly markets, antitrust concerns often involve the risk that the firms will engage in joint price-setting to achieve noncompetitive prices. Global price-fixing conspiracies have been uncovered in lysine (an agriculture input),³ citric acid,⁴ and vitamins.⁵ Several airlines were found to have fixed the price of air cargo.⁶ Examples of collective monopsony power include the purchase of specialized athletic services by the National College Athletic Association (NCAA)⁷ and major professional sports leagues.⁸ McDonald's and its franchisees likely have monopsony power over their experienced workers.⁹

Some markets are dominated by a single firm. In these markets, the firm has the ability to set supra-competitive prices that substantially exceed the competitive price. Firms can become dominant by holding patents or being the first-mover or innovator in a market in which there are economies of scale. These economies of scale may lead to lower average costs as volume increases. There can also be economies of scale on the demand side from consumers wishing to purchase the same product as others, such that the quality of the product increases with volume, through what economists call

² Monopsony power is the power to profitably reduce the price paid for an input below the competitive level. See John B. Kirkwood, *Market Power and Antitrust Enforcement*, 98 B.U. L. Rev. 1169 (2018); Thomas G. Krattenmaker and Steven C. Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 Yale L.J. 209 (1986).

³ *In re Amino Acid Lysine Antitrust Litigation*, 918 F. Supp. 1181 (N.D. Ill. 1996).

⁴ *In re Citric Acid Litigation*, 191 F.3d 1090 (9th Cir. 1999).

⁵ *In re Vitamins Antitrust Litigation*, 198 F.R.D. 296 (D.D.C. 2000); *In re Vitamins Antitrust Class Actions*, 327 F.3d 1207 (D.C. Cir. 2003).

⁶ *In re Air Cargo Shipping Services Antitrust Litigation*, 697 F.3d 154 (2d Cir. 2012).

⁷ See, for example, *NCAA v. Alston*, 594 U.S. 69 (2021).

⁸ See, for example, *Smith v. Pro Football, Inc.*, 593 F.2d 1173 (D.C. Cir. 1978).

⁹ *Leinani Deslandes v. McDonald's USA LLC*, 81 F.4th 699 (7th Cir. 2023).

network effects. Historical examples of monopoly firms include Standard Oil,¹⁰ U.S. Steel,¹¹ AT&T,¹² and Alcoa.¹³ More recent examples of do

minant firms on the sell-side include Google's position in search advertising¹⁴ and online advertising exchanges,¹⁵ Live Nation/Ticketmaster's position in concert ticket sales,¹⁶ and possibly Amazon's position in online retail sales.¹⁷

B. Market Power and Competitive Effects

Competitive markets create substantial economic benefits. For consumers, these benefits include lower prices, increased quality, and a wider range of choices that are responsive to consumer desires. On the seller side, competition leads to greater efficiency (lower costs of production, distribution, and transacting). Competition generally also fosters faster and better innovation.

The enemy of competition is market power—the ability of and incentive for one or a group of market participants (generally firms) to set supra-competitive prices to the detriment of market efficiency and the counterparties with which they transact. Market power by sellers involves setting higher prices, which leads consumers to purchase less of the product. *Monopoly power* is substantial and durable market power.

Monopoly power on the seller side leads to higher prices charged to customers; monopsony power on the buyer side leads to lower prices paid for inputs (including lower wages). Both reduce the volume of product transacted.

1. Collusion and exclusion

Market power on the seller side or the buyer side can be achieved or maintained by a single firm (termed *unilateral*) or a group of firms (termed *coordinated*). Anticompetitive conduct can be either *collusive* or *exclusionary*. Collusive conduct can be characterized as “marrying” or “dating” competitors. Exclusionary conduct involves “killing” or “maiming” competitors.

Collusive conduct is intended to benefit a group of firms by reducing competition among them. Such groups of firms are sometimes referred to as *cartels*. Exclusionary conduct is intended to benefit a single firm or a group of firms by destroying, disadvantaging, or deterring competition by one or more actual or potential competitors. Collusive and exclusionary conduct can achieve or maintain

¹⁰ *Standard Oil Co. v. United States*, 221 U. S. 1 (1911).

¹¹ *United States v. United States Steel Corp.*, 240 U.S. 442 (1916).

¹² *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983).

¹³ *United States v. Aluminum Co. of America (Alcoa)*, 148 F.2d 416 (2d Cir. 1945).

¹⁴ *United States v. Google LLC*, 747 F. Supp. 3d 1 (D.D.C. 2024).

¹⁵ *United States v. Google LLC*, No. 1:23-cv-00108 (E.D. Va. Apr. 17, 2025) [mem. op.].

¹⁶ *United States v. Live Nation Ent., Inc.*, No. 1:24-cv-03973 (S.D.N.Y. filed May 23, 2024).

¹⁷ *FTC v. Amazon.com, Inc.*, No. 2:23-cv-01495 (W.D. Wash. filed Sept. 26, 2023).

market power. These types of behavior can be employed together in complementary ways. Both can generate supra-competitive profits for the firm or firms.

The simplest form of anticompetitive collusive conduct involves joint pricing or the allocation of customers by competing firms with the purpose of raising prices. The simplest form of exclusionary conduct involves actions by one firm to raise the costs or otherwise disadvantage rival firms with the purpose of raising or maintaining prices. Colluding firms may engage in exclusionary conduct to maintain their market power. Exclusionary conduct may be implemented unilaterally by a single firm or in coordination with other firms (competitors or trading partners).

Both collusive and exclusionary conduct can generate procompetitive benefits as well as harms. The anticompetitive effects of collusive and exclusionary conduct have much in common. Jonathan Baker describes exclusion as essentially creating an involuntary or coerced cartel.¹⁸ Both collusive and exclusionary conduct can lead to or support cartels, single-firm monopolies, or market power. Cartels regularly engage in exclusionary conduct.¹⁹

Both collusive and exclusionary conduct can be used by groups of firms with an agreement. Collusive conduct involves a horizontal restraint, such as a tacit or express agreement between a firm and its competitors to jointly raise prices. An analogous form of exclusionary conduct would involve that firm making an agreement with one or more input suppliers to raise the prices they charge to the firm's rivals, in order to force them to reduce output or raise their output prices, thereby providing the firm with incremental market power it can exploit.²⁰

The sidebar below addresses some possible confusion over the different ways in which economics and law use some of these terms.

¹⁸ Jonathan B. Baker, *Exclusion as a Core Competition Concern*, 78 ANTITRUST L.J. 527, 556-58 (2013).

¹⁹ Margaret, C. Levenstein and Valerie Y. Suslow, *How do Cartels use Vertical Restraints? Horizontal and Vertical Working in Tandem*, 83 ANTITRUST L.J. 15 (2020). For an excellent case law example, see *JTC Petroleum Co. v. Piasa Motor Fuels, Inc.*, 190 F.3d 775 (7th Cir. 1999) (Posner, C.J.).

²⁰ As a vertical restraint can involve cooperation or an agreement, it might be termed collusive; but using the term collusive to refer to nothing more than an agreement is not common in antitrust law.

Differences between terms used in economics and antitrust

This monograph uses economic terminology to describe conduct and effects. That terminology can be confusing, because the terms are often used differently in law and economics.

Economists loosely refer to a monopoly market as having a single seller, but with the understanding that the monopolist's price is constrained by the availability of other "outside" products sold in other markets. By contrast, antitrust law refers to a monopolist as a firm with monopoly power. Economics uses the terms *monopoly power* and *market power* interchangeably. By contrast, antitrust law refers to monopoly power as a substantial and durable degree of market power. One economic model of monopoly power that bridges this gap involves a dominant firm that has monopoly power but is constrained by a weaker competitive fringe of small sellers.

Economists and lawyers may also use the terms *collusive* and *exclusionary conduct* differently. This monograph uses the term *collusive* to refer to conduct undertaken in parallel by a group of competitors. That conduct may arise from a formal contract, informal cooperation, or simply firms' recognition of their interdependence in a market (i.e., tacit collusion). Collusive conduct may be anticompetitive, procompetitive, or neutral.

Some legal commentators or courts use the term *collusive* to refer only to anticompetitive collusive conduct. Some use the term *collusive* only to refer to conduct with the sole or primary purpose of reducing or eliminating competition, using the term *coordinated* conduct in other situations

This monograph uses the term *exclusionary* to refer to conduct undertaken by a single firm or group of firms that disadvantages rivals by raising their costs or reducing their revenues. Such conduct may be anticompetitive, procompetitive, or neutral. Confusion can arise because some legal commentators or courts use the term *exclusionary* to refer only to anticompetitive exclusionary conduct.

2. Procompetitive conduct

Collusive and exclusionary conduct can lead to harmful market power, but anticompetitive outcomes are not inevitable. Indeed, both exclusionary and collusive conduct may create procompetitive benefits, including lower prices and higher output on the sell side and higher input prices and purchases on the buy side. They can also lead to lower costs, improved product quality and variety, and faster and better research and development (R&D) and innovation. These benefits may flow from integration of production facilities and enhanced competitive incentives that occur from joint decision making by the firms to eliminate free-riding or failure to take account of beneficial spillover effects. It is possible that these procompetitive effects more than offset the harms, leading to increased competition and greater overall economic welfare.

II. Connecting the Economic Analysis to Antitrust Law

Antitrust law is designed to support and protect competitive markets. It seeks to deter and interdict interference with competition on the sell or buy side, by preventing collusive agreements (including mergers) that lead to market power and preventing exclusionary or otherwise anticompetitive conduct that can allow a firm to achieve or maintain market power.

A. The Role of Economic Analysis in Antitrust

Economic analysis is used to evaluate the effect of firms' conduct on market outcomes (prices, output, product variety, investment, innovation, and so on). It can be used to evaluate the impact of anticompetitive activities on the welfare of purchasers or suppliers who are directly targeted by the alleged restraints; the effects of the restraints on the efficiency (i.e., cost) of production; the impact of the conduct on the total economic welfare of all market participants, including the defendants and their rivals, who may be benefited or harmed; and the impact on the distribution of income and wealth.

Most antitrust cases involve market power issues on the sell side. In recent years, however, concerns about monopsony power and anticompetitive conduct directed at workers have increased.²¹ Such conduct includes fixing the wage rates paid to employees or contractors or agreeing not to compete with workers at other firms. Examples include the “no-poach” agreements between McDonalds and its franchisees²² and between Google and its Silicon Valley competitors.²³ A merger that lead to buyer-side monopsony power by health insurers can give the merged firm monopsony power over hospitals or doctors.²⁴

Antitrust concerns can also involve an intermediary firm that simultaneously gains market power over sell-side customers and monopsony power over buy-side suppliers. In a 2023 antitrust case brought against Google, for example, the government argued that Google's control of the display advertising exchange gave it power over newspapers selling display ads and the advertisers purchasing them.²⁵ Similar concerns have been raised about the ability of a monopoly ride-share firm to exercise monopsony power over drivers and market power over consumers. Similarly, a monopoly

²¹ See, for example, Suresh Naidu et al. *Antitrust Remedies for Labor Market Power*, 132 HARV. L. REV. 536 (2018).

Eric A. Posner, *The New Labor Antitrust*, 86 ANTITRUST L.J. 503 (2024).

²² See *Deslandes v. McDonald's USA, LLC*, 81 F.4th 699 (7th Cir. 2023).

²³ See *United States v. Adobe Sys., Inc., Apple Inc., Google Inc., Intel Corp., Intuit, Inc. & Pixar*, Civ. Action No. 1:10-cv-01629 (D.D.C. Sept. 24, 2010) (complaint filed); *United States v. Adobe Sys., Inc.*, Civ. Action No. 1:10-cv-01629 (D.D.C. Mar. 17, 2011) (Final Judgment); *In re High-Tech Emp. Antitrust Litig.*, 856 F. Supp. 2d 1103 (N.D. Cal. 2012).

²⁴ See *United States v. Anthem, Inc.*, 236 F. Supp. 3d 171 (D.D.C. 2017), *aff'd*, 855 F.3d 345 (D.C. Cir. 2017); *United States v. Aetna Inc.*, 240 F. Supp. 3d 1 (D.D.C. 2017).

²⁵ *United States v. Google LLC*, No. 1:23-cv-00108 (E.D. Va. Jan. 24, 2023) (complaint filed); *United States v. Google LLC*, No. 1:23-cv-00108 (E.D. Va. Apr. 17, 2025) (Mem. Op.).

sports league like Major League Baseball can exercise market power over video streaming networks and monopsony power over players.

It is important to reiterate that integration or cooperation by competitors can sometimes be beneficial. Agreements among competitors may reduce or eliminate competition between them but lead to increased competition with others, such that competition increases overall. Agreements among firms producing complementary products or firms at adjacent vertical levels of production that mandate or incentivize exclusivity can lead to anticompetitive effects but also to cost savings, higher-quality products, and/or enhanced competitive incentives that lead to procompetitive effects on balance.

Interesting antitrust issues arise when firms attempt to reduce competition with what might be called good intentions. Suppose, for example, that the cigarette companies agreed to stop advertising directed at teenagers or that all the restaurants in a city reached an agreement through their trade association to levy a common surcharge to be divided among the kitchen workers and wait staff. The elimination of price and advertising competition would likely violate the antitrust laws, because these restraints would harm the competitive process and consumer welfare by leading to higher prices. However, the Supreme Court did choose not to per se ban dental price advertising by an association of dentists, on the grounds that it might benefit consumers by reducing deception.²⁶

Antitrust faces a difficult conflict when beneficial innovations that create new products or lower costs lead the innovator to achieve substantial market power. Under antitrust law, a firm that gains monopoly power as a result of innovations—or even just luck—is permitted to exploit that power by charging high prices. Antitrust liability occurs only when the achievement or maintenance of monopoly power is caused or aided by exclusionary restraints on competition. More difficult antitrust concerns arise when innovations are aided by restraints on competition or restraints are essential to obtaining the innovation.

B. The Consumer Welfare Standard

Section 1 of the Sherman Act prohibits agreements “in restraint of trade.” Section 7 of the Clayton Act prohibits mergers that may substantially reduce competition. Early on, courts recognized that all contracts, by their very nature, restrain trade and added the qualifier “unreasonably.”

These legal standards do not automatically imply unique economic standards. The sense in which an agreement or other restraint is unreasonable depends on the definition of the economic goal. The term *competition* can take on multiple meanings, including a perfectly competitive outcome, a market process in which no firm has monopoly power or dominance, or simply the process by which some firms prosper and others fall behind.²⁷

²⁶ *California Dental Association v. FTC*, 526 U.S. 756, 757, 770 (1999).

²⁷ Robert H. Bork, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 58-61 (1978).

Antitrust law aims to prevent harm to consumer welfare. In economics, the term *consumer welfare* refers to *consumer surplus*, defined as the value consumers place on a purchased product over and above the price they pay for it. Consumer surplus and the consumer welfare standard in antitrust do not directly include concerns about income distribution, hierarchical power, maintenance of a small business economy, or other possible economic goals. Most contemporary courts and commentators state that the overarching goal of antitrust law is to prevent conduct that reduces competition (i.e., rivalry among sellers) in ways that reduce the welfare of consumers (or trading partners/counterparties more generally).

The legislative histories of the antitrust laws are consistent with this formulation.²⁸ They also show that the principal motivation of the legislators who passed them was not to promote economic welfare but to protect consumers from exploitation. Those legislators objected to trusts and monopolies principally because they raised prices and appropriated the wealth of consumers for themselves. Members of Congress repeatedly compared this conduct to robbery and extortion.

Congress had an equally strong desire to protect small suppliers, such as farmers and workers, from exploitation in the form of conduct that suppressed rivalry, created market power on the buying side, lowered wages and other payments to small suppliers, and transferred their wealth to powerful buyers.²⁹ However, it did not want to interfere with the basic notion of unregulated private markets.

Robert Bork proposed that the goal of antitrust should be “consumer welfare.”³⁰ But he used the term to mean what economics would call *total welfare*. Total welfare includes *producer surplus*, defined as producers’ profits, where producers include both the defendant(s) and rivals who may benefit or be harmed by the restraint. Conduct that increases the seller(s)’ profits (producer surplus) by more than it reduces consumer surplus would thus not be considered anticompetitive.³¹ A similar view would balance the harms suffered by the consumers in the market against any benefits achieved by consumers in other markets.³²

²⁸ See Robert H. Lande, *Wealth Transfers as the Original and Primary Concern of Antitrust: The Efficiency Interpretation Challenged*, 34 HASTINGS L.J. 65 (1982); Frank H. Easterbrook, *Workable Antitrust Policy*, 84 MICH. L.J. 1696, 1702-03 (1986).

²⁹ Robert H. Lande, *Chicago's False Foundation: Wealth Transfers (Not Just Efficiency) Should Guide Antitrust*, 58 ANTITRUST L.J. 631 (1989); John B. Kirkwood and Robert H. Lande, *The Fundamental Goal of Antitrust: Protecting Consumers, not Increasing Efficiency*, 84 NOTRE DAME L. REV. 191 (2008); John B. Kirkwood, *Antitrust's Fairness Goal*, MEMPHIS L. REV. (forthcoming 2026).

³⁰ Robert H. Bork, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 107-110 (1978).

³¹ *Id.*

³² Louis Kaplow, *Out of Market, Out of Mind*, 87 ANTITRUST L.J. 427 (2026). Kaplow would seem to treat the benefits achieved by the firms within the market as amounting to out-of-market benefits, because the firms could invest their supra-competitive profits in activities in other markets.

Bork's policy prescriptions did not consistently apply the concept of total welfare. In analyzing exclusionary conduct, his analysis counted only the benefits accruing to the defendant firm(s), not the loss of producer surplus from the conduct suffered by rivals disadvantaged by the conduct.³³

Use of the term *consumer welfare* raises other definitional complications. Consider, for example, an agreement by crude oil producers to raise their prices. One interpretation of *consumer* is the direct purchasers that are the sellers' counterparties—that is, the refineries that produce gasoline and other petroleum products. Another can mean *final consumers*—that is, the people who use gasoline to power their vehicles and purchase the plastic products made from petrochemicals. Antitrust generally focuses on direct purchasers, making the assumption that the higher prices paid by these direct purchasers will lead to higher prices, lower quality, or other harms suffered by final consumers.

Antitrust also applies to conduct by purchasers that harms their counterparty sellers. For example, collusion by a group of firms to reduce the prices paid for agricultural products or other inputs can involve lower wage rates paid to their workers—a violation of Section 1. This behavior can be incorporated into the standard by treating the welfare of any set of counterparties as analogous to consumer welfare. A better term might therefore be *trading partner* or *counterparty* welfare.

The consumer welfare standard raises yet another complication. Suppose that the collusive agreement among employers who hire labor at low wage rates reduces their costs, which then lead them to reduce the prices or increase the quality of the products they sell.³⁴ Antitrust case law has evolved on this issue. At one time, courts approved such collusive agreement, under the view that only the welfare of downstream consumers matters.³⁵ Modern antitrust has moved in the direction of condemning conduct that benefits final consumers while harming workers or other input suppliers.³⁶

III. Market Power and Barriers to Entry

The analysis of market power is central in antitrust economics and law. Antitrust harms to consumer (or other counterparty) welfare from anticompetitive conduct are associated with what can be termed *increased market power*, defined as the achievement, enhancement, or maintenance of market power. Establishing competitive harm normally requires direct evidence of anticompetitive harm

³³ Steven C. Salop, *Question: What Is the Real and Proper Antitrust Welfare Standard? Answer: The True Consumer Welfare Standard*, 22 LOYOLA CONSUMER L. REV. 336, 344-45 (2010). However, Bork did endorse *Lorain Journal*, and he represented Netscape in *Microsoft*. See Harry First, *Bork and Microsoft: Why Bork Was Right and What We Learn About Judging Exclusionary Behavior*, 79 ANTITRUST L.J. 1017 (2014).

³⁴ Collusive purchasing of inputs usually leads to higher prices of the output sold to customers, because the lower input prices lead to less of the input being supplied and less output being produced, which raises output prices. The hypothetical example in the text is sometimes observed, however.

³⁵ See, for example, *Kartell v. Blue Shield of Mass., Inc.*, 749 F.2d 922 (1st Cir. 1984); *Addamax Corp. v. Open Software Found., Inc.*, 152 F.3d 48 (1st Cir. 1998).

³⁶ See, for example, *Knevelbaard Dairies v. Kraft Foods, Inc.*, 232 F.3d 979 (9th Cir. 2000); *Todd v. Exxon Corp.*, 275 F.3d 191 (2d Cir. 2001).

from the alleged anticompetitive conduct, indirect evidence of likely harm in light of a finding of the defendant's market power in the relevant market, or both.

Causing such harm requires the defendant firm(s) to achieve, enhance, or maintain market power. Market power is supported by barriers to entry. This section examines these two economic building blocks.

A. Market Power

The economic definition of market power is the ability and incentive to profitably charge a price above the competitive level. In economics, the competitive level is marginal cost. Antitrust law is most concerned with durable (as opposed to transitory) market power. Market power on the buyer side is the ability and incentive to profitably lower prices below the competitive level, commonly referred to as having *monopsony power*. For market power to be durable, it is also necessary that the market has barriers to entry.

The legal definition of monopoly power set out in *Du Pont* was expressed as “the power to control price or exclude competition.”³⁷ The power to control price may be viewed as referring to single-firm and collusive direct price increases; the power to exclude competition may be viewed as referring to exclusionary conduct.³⁸ Part III of this monograph examines the importance of the distinction between these two routes to monopoly power. The focus here is on the power to control price.

In antitrust cases, market (or monopoly) power can be established with direct evidence or indirect evidence. Indirect evidence based on market shares in a relevant market is commonly used, although economists consider direct evidence more reliable when available and probative, as market shares provide only circumstantial evidence.

1. Indirect evidence of market power: Market definition and market shares

The calculation of the market share of a single firm or group of firms requires a relevant market to be defined.³⁹ It is sometimes characterized as the *area of effective competition*. This definition is imprecise and inherently subjective. It is also not responsive to the reason for defining a relevant market in an antitrust case—that is, the potential that the conduct will lead to consumer harm from increased market power. The economic function of market definition is the identification of constraints on the ability and incentive of the defendant firm(s) to exercise increased market power by the conduct at issue in the case.

Du Pont suggested that the relevant market includes products that are “reasonably interchangeable” with one another. Reasonable interchangeability is normally based on the ease and willingness of purchasers to substitute among products, what is termed *demand substitution*. *Brown Shoe* listed a

³⁷ *United States v. E. I. Du Pont de Nemours & Co.*, U.S. 377, 391 (1956).

³⁸ Thomas G. Krattenmaker, Robert H. Lande, and Steven C. Salop, *Market Power and Monopoly Power in Antitrust Law*, 76 GEO. L.J. 241 (1987).

³⁹ For discussion of practical and policy issues arising in market definition, see Jonathan B. Baker, *Market Definition: An Analytical Overview*, 74 ANTITRUST L.J. 129 (2007).

number of “practical indicia” (qualitative factors) that might be useful evidence of this substitution.⁴⁰ The “hypothetical monopolist” test (HMT)—originally developed by economists for merger analysis—is a quantitative methodology for evaluating reasonable interchangeability. *Du Pont* refers to the cross-elasticity of demand as the key quantitative economic measure; the HMT is conceptually based on the related concept of own-elasticity of demand. Its modern form also uses cross-elasticity. (The sidebar below explains these elasticities.)

Own- and cross-elasticity of demand defined

The market definition concept set out in *Du Pont*⁴¹ flagged the cross-elasticity of demand, defined as the percentage reduction in demand for one product when another product raises its price by 1 percent. Since the 1982, the Merger Guidelines issued by the Department of Justice and Federal Trade Commission have used the Hypothetical Monopolist Test (HMT). This test is based on the own-elasticity of demand, defined as the percentage reduction in the quantity demanded when a firm (or group of firms) raises prices by 1 percent. It is connected to (but not the same as) the slope of the demand curve (the absolute reduction in the number of units demanded from a \$1 increase in price). The market definition concept set out in *Du Pont* flagged the *cross-elasticity of demand*, defined as the percentage reduction in demand for one product when another product raises its price by 1 percent.

To see how the concepts of own- and cross-elasticities are related, suppose that a firm raises the price of its product by 5 percent. This increase will reduce this firm’s demand by a certain percentage, which is gauged by its own-elasticity. If, for example, the 5 percent price increase leads to a 10 percent demand reduction, the own-elasticity is 2 (10/5).

The increase in the price of this product will also increase the quantity demanded of each of the substitute products, which is gauged by their cross-elasticities. If, for example, the price of one substitute product rises by 2 percent, its cross-elasticity is 0.4 (2/5). If another product’s demand rises by 15 percent, its cross-elasticity is 3 (15/5).

Because the magnitude of the sales gained by the substitutes are connected to the sales lost by the first product, the own-elasticity and the various cross-elasticities are linked. Own-elasticity is a type of weighted-average of the cross-elasticities, where the weights depend on the relative sales of the various substitutes.

Products that are used together (e.g., ice cream and cones) are called *complements*. The cross-elasticity of demand for complementary products is negative: (an increase in the price of ice cream reduces demand for cones).

The HMT gauges the magnitude of substitution, the recipients of the substitution, and the profitability of a small but significant nontransitory increase in price (SSNIP) of a set of products proposed to comprise the relevant market. For example, suppose that BMW were to raise its prices. How many customers would it lose, and which vehicles would consumers choose instead? If all the luxury vehicle brands raised their prices simultaneously—by, say, a uniform percentage—what fraction of all their

⁴⁰ *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 (1962).

⁴¹ *United States v. E. I. Du Pont de Nemours & Co.*, 351 U.S. 377 (1956).

customers would shift to nonluxury brands? Taking account of the price/cost margins of these brands, what would be the effect on profits?

For the purposes of the HMT, these products are assumed to be owned and operated by a hypothetical monopolist, and the substitute firms are assumed not to raise their prices in response. The possibility of price increases by these substitutes (which are assumed to be outside the market) is normally accounted for as part of the competitive effects analysis, not the market definition.

The HMT does not lead to a unique market definition; multiple products or groups of products can satisfy it. For example, a proposed market consisting of all brands and types of beer may satisfy the HMT, but so might a market comprised of all alcoholic beverages or a narrow market restricted only to light beer brands. Indeed, a market of all potable liquids would satisfy the HMT.⁴² This non-uniqueness raises the contentious question of which of the panoply of possible market definitions satisfying the HMT is the appropriate one for a particular antitrust case.⁴³

The fact that the HMT does not define a unique relevant market is not a flaw, as its goal is to identify sets of purchasers that are vulnerable to the exercise of market power by the firm(s). If allegedly anticompetitive conduct permits the defendant to achieve, enhance, or maintain market power and lead to anticompetitive effects in any relevant market (or markets), it can violate the antitrust laws.

Once a relevant market is defined, market shares can be calculated. The shares are typically based on the share of revenues, but volume shares might sometimes be considered a useful or even a better measure of market power. Capacity shares might also be useful, in that price increases by some firms might lead to substitution to others without price increases only if those other firms have excess capacity.

Antitrust law treats monopoly power as a “substantial” amount of market power; a finding of monopoly power also requires a showing that that power is durable over time as well as substantial at every moment of time. Section 2 analysis of monopoly power also appears to involve a concern with dominance, which is also a measure of substantial power.⁴⁴ Courts generally require a market share of at least 50 percent (if not 60–70 percent or more) for establishing monopoly power.⁴⁵ For this reason, it is common for the plaintiff in a monopolization or merger case to propose a narrow

⁴² In the *Coca Cola/Dr. Pepper* merger litigation in the 1980s, Coca Cola proposed a similar broad market definition of all beverages. This gambit was jokingly characterized as the “Lake Erie” defense.

⁴³ The 1982 Merger Guidelines initially proposed the application of a “smallest market principle,” under which the relevant market is the narrowest market including the product of at least one of the merging firms that satisfies the HMT. There is no economic basis for preferring the smallest market; its relevance has been weakened over the years.

⁴⁴ Article 102 of the European competition law outlaws “abuse of dominance.” This statute can find violations for some exploitative conduct as well as exclusionary conduct. See European Commission, Guidelines on Exclusionary Abuses of Dominance, https://competition-policy.ec.europa.eu/public-consultations/2024-article-102-guidelines_en.

⁴⁵ *Broadway Delivery Corp. v. United Parcel Serv., Inc.*, 651 F.2d 122, 124 (2d Cir. 1981). See also *United States v. Microsoft Corp.*, 253 F.3d 34, 70 (D.C. Cir. 2001) (en banc); *United States v. Microsoft Corp.*, 87 F.Supp.2d 30, 52 (D.D.C. 2000).

market in which the defendant's share is large and for the defendant to offer a broader market definition in which its share is small.

2. Direct evidence of market power

Direct evidence of market power can involve market effects that are consistent with the existence or exercise of market power but inconsistent with firms that lack market power. It can also involve evidence of the impact of exclusionary conduct.

Direct evidence can be both a substitute for and a complement to indirect evidence based on market shares in a relevant market. As explained in *Indiana Federation of Dentists*, direct "proof of actual detrimental effects, such as a reduction of output" can obviate the need for an inquiry into market power, which is but a "surrogate for detrimental effects." The Court concluded that "the finding of actual, sustained adverse effects on competition in those areas where IFD dentists predominated, viewed in light of the reality that markets for dental services tend to be relatively localized, is legally sufficient to support a finding that the challenged restraint was unreasonable even in the absence of elaborate market analysis."⁴⁶ The 2010 Merger Guidelines also note that direct evidence is normally considered more reliable than circumstantial evidence based on market shares.⁴⁷

In *American Express*, by contrast, the Court rejected reliance on direct evidence in a case involving an exclusionary vertical restraint.⁴⁸ Its majority argued that "vertical restraints often pose no risk to competition unless the entity imposing them has market power, which cannot be evaluated unless the Court first defines the relevant market."⁴⁹ Direct evidence of anticompetitive effects in the American Express record led Justice Breyer's dissent to quote *Indiana Federation*.⁵⁰ Ironically, the Court cited an article written by Judge Easterbrook as support for its position,⁵¹ despite the fact that the article explicitly stated that "an inquiry into market power does not entail the definition of a 'market,' a subject that has bedeviled the law of mergers. Market definition is just a tool in the investigation of market power."

In light of the traditional economic definition of market power as pricing above marginal costs, one might treat a price that exceeds marginal cost as the best evidence of market power.⁵² However, by themselves high price/cost margins may not be considered sufficient evidence. There is a mismatch between this technical economic definition and the focus of antitrust concerns. A single firm's price above marginal cost indicates the existence of some degree of pricing discretion, but it does not automatically imply that collusive or exclusionary conduct is at play. For example, a patent license

⁴⁶ *FTC v. Ind. Federation of Dentists*, 476 U.S. 447, 461 (1986).

⁴⁷ See Horizontal Merger Guidelines § 4 ("Such evidence also may more directly predict the competitive effects of a merger, reducing the role of inferences from market definition and market shares").

⁴⁸ The Court conceded the role of direct evidence in horizontal restraint cases like *Indiana Federation of Dentists*.

⁴⁹ *Ohio v. American Express Co.*, 585 U.S. 529, 544 n.7 (2018).

⁵⁰ *Id.* at 564.

⁵¹ Frank H. Easterbrook, Vertical Arrangements and the Rule of Reason, 53 ANTITRUST L.J. 135, 160 (1984).

⁵² See John B. Kirkwood, *Market Power and Antitrust Enforcement*, 98 B.U. L. Rev. 1169 (2018); see also Thomas G. Krattenmaker and Steven C. Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power over Price*, 96 Yale L.J. 209 (1986).

normally allows a firm to price above the zero or *de minimis* marginal cost of another license holder, but there may be sufficiently close substitutes for each of two patents that a merger between the two patentholders would not lead to a profitable price increase.

Similarly, even a firm with a small market share in a differentiated product market that seems vigorously competitive may have a substantial price/cost margin. Consider, for example, the monopolistically competitive market for shampoo, in which numerous brands with somewhat different characteristics charge prices above marginal costs and attract loyal customers. If consumers are imperfectly informed about the prices of identical products charged at various stores and there is a cost of information or search across stores, even atomistically competitive firms will have the power to raise prices above the competitive level, perhaps even substantially so.⁵³

i. Barriers to entry

Monopoly power and durable market power require the existence of entry barriers. Absent barriers, an anticompetitive price increase may lead to entry that will render the price increase unprofitable; even a firm with a market share of 100 percent may be unable to maintain a price above its marginal cost. To see why, consider a monopolist that can produce a good at a constant marginal cost of \$10 per unit and no fixed costs. Suppose the monopoly price is \$100. If potential entrants exist that can produce a product of the same quality at an identical marginal cost, without incurring fixed costs or facing other costs of entry, and there are so many potential entrants that collusion would be impossible, the monopolist's attempts to charge a price of \$100 would cause entrants to swarm in, undercutting its price and immediately capturing the entire market. In fact, entry would occur at any price materially above \$10. At the price of \$10, the incumbent monopolist would maintain its 100 percent market share, but it would earn zero profits, because it would be forced to charge a price equal to marginal cost.

One might think that this model of a "contestable market" is a powerful reason to permit a laissez-faire policy. In fact, the result is actually very weak. To see why, suppose that entrants have to bear some trivial magnitude of entry costs, as the monopolist did when it entered, and suppose that these entry costs are "sunk"—that is, unrecoverable if the competitor exits from the market. This slight perturbation in the assumption has the dramatic effect of totally deterring entry, permitting the incumbent monopolist to charge the monopoly price of \$100 without fear of entry.

The economic analysis is simple. Suppose the monopolist charges \$100. Potential entrants realize that entry would immediately lead to intense price competition that would continue until the price lands at the competitive price of \$10. At that point, the entrant would earn zero profits on its sales. As the entrant would have borne the sunk entry costs, its entry would be unprofitable. Thus, it would not enter.

This combination of sunk entry costs and post-entry competition is discussed in more detail below. It serves as a cautionary tale about relying on entry to deter monopoly power and support laissez-faire antitrust policy.

⁵³ See Peter A. Diamond, *A Model of Price Adjustment*, 3 J. ECON. THEORY 156 (1971); Steven Salop and Joseph Stiglitz, *Bargains and Ripoffs: A Model of Monopolistically Competitive Price Dispersion*, 44 REV. ECON. STUD. 493 (1977).

Barriers to entry may be natural or strategic. *Natural barriers* arise from the production technology or demand characteristics. *Strategic barriers* arise from the exclusionary conduct of one or more incumbent firms.

There are numerous sources of natural entry barriers, some of which involve sunk costs. Regulations and monopoly grants can prevent new firms from entering a markets. Entry barriers arise when potential entrants have higher costs than established firms. These cost disadvantages can include technological disadvantages and limited access to essential inputs, including natural resources, personnel, know-how, or channels of distribution. New entrants may face higher costs of establishing a reputation than incumbent firms did. This disadvantage may lead the potential entrant to have higher variable costs, which can permit a cartel or a real or hypothetical monopolist to charge supra-competitive prices.

Even potential entrants with the same or lower costs than the incumbent firms can face entry barriers, if technological economies of scale or scope or substantial capital costs require a significant scale of production in order to earn profits. This need to enter at a significant scale can lead to post-entry price reductions by established firms that will make it even harder for the entrant to achieve viability. When the entrant faces sunk costs of entry, the anticipation of this post-entry price competition can lead to entry barriers that permit established firms to charge supra-competitive prices without attracting entry from equally efficient entrants.

Network effects can have a similar impact. Network effects amount to “demand-side” economies of scale, because they involve increased demand for the firm’s product when its volume increases.⁵⁴ They can arise when consumers communicate with one another. A communication network like telephony or email with only one user obviously has no value; the more people one can call, the more valuable the network becomes. These effects are known as *direct network effects*.

Network effects can also arise because the existence of more consumers buying the product leads other firms to produce complementary products, which increases the value and demand for the first product. For example, an increase in the number of internal combustion engine vehicles increases demand for gasoline. These effects are termed *indirect network effects*.

In the past, economists disagreed about the definition of barriers to entry, as discussed in the sidebar. This disagreement has since subsided; the concept now includes all impediments to entry that permit incumbent firms to charge prices above the perfectly competitive level.

How the definition of *barriers to entry* affects antitrust action

The definition of entry barriers as factors that can permit a monopolist to maintain supra-competitive prices was first introduced by American economist Joe Bain. In response, University of Chicago economist George Stigler limited the definition of entry barriers solely to situations in which the entrant has higher costs or faces entry costs than the incumbent monopolist did not. This definition can overlook the deterring impact of any first-mover advantages of the monopolist (e.g., consumer switching costs that it did not face when it entered). It also ignores the powerful entry-

⁵⁴ Supply-side economies of scale involve lower average or marginal costs when the firm’s production volume increases.

detering impact of post-entry price competition when there are sunk costs, as discussed below. Both of these factors can deter the entry of equally efficient entrants and give the incumbent monopolist the ability to continue to charge the monopoly price without the fear of such entry. Use of this definition would lead to less antitrust enforcement—an intended result of the Stigler definition. In defending the Stigler definition, some economists distinguished between these “Stiglierian” barriers to entry and other “impediments” to entry. Today, all of them are considered entry barriers.

Sources: Joe S. Bain, *BARRIERS TO NEW COMPETITION* 1,3 (1962); George J. Stigler, *Monopolistic Competition in Retrospect*, in *THE ORGANIZATION OF INDUSTRY* 67 (1968). Harold Demsetz, *Barriers to Entry*, 72 *AM. ECON. REV.* 47, 47-48 (1982). For further discussion and criticism of Stigler’s approach, see Herbert Hovenkamp & Fiona Scott Morton, *Framing the Chicago School of Antitrust Analysis*, 168 *U. PA. L.R.* 1843, 1861-63 (2020).

ii. Economies of scale

Economies of scale cause average total cost (ATC) to fall, potentially leading to a concentrated market. This concentration results because the scale economies create cost disadvantages and barriers to entry for firms producing low volumes. Producing multiple related products (e.g., cars and light trucks) can also create economies of scale.

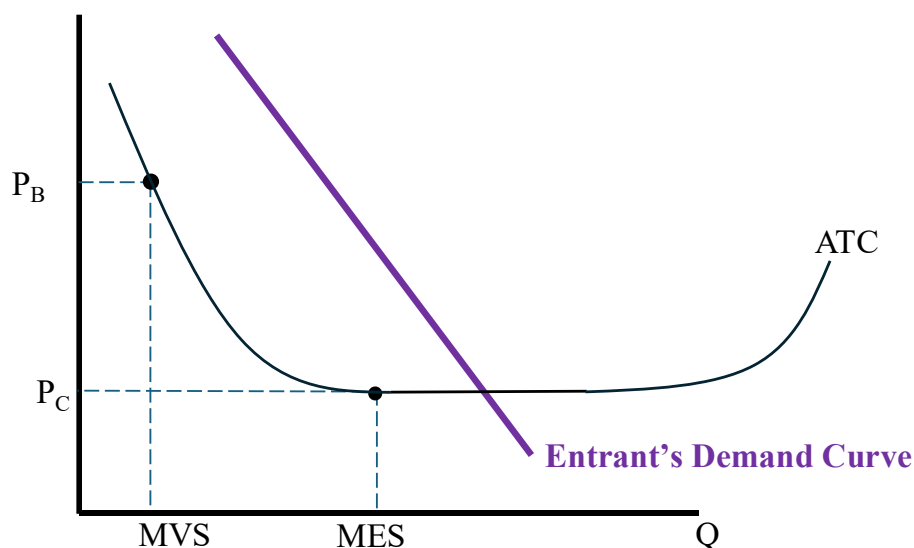
Economies of scale and scope can lead to entry barriers if entry is profitable only with large scale or scope. Large-scale entry is more likely to create a substantial price reduction by the incumbent firm(s), which can make entry even less profitable, as discussed below.

Two key economic concepts are *minimum efficient scale* (MES) and *minimum viable scale* (MVS). MES is the scale of production that minimizes ATC. When there are economies of scale, the MES can involve a substantial level of production.

MVS is the scale of production at which a firm earns only a competitive rate of return on investment given a specific price. If this competitive rate of return is treated as an opportunity cost and included in the firm’s cost curve, the MVS amounts to a break-even scale of production. The competitive profit level is measured as economic profits, which may differ from accounting profits.⁵⁵

In Figure 2.1, the ATC declines until it reaches the MES, at which point it is constant until a much larger volume is reached. After that point, production efficiency declines and ATC begins to rise. (The level of cost at the MES is often considered to be the perfectly competitive price, as denoted by P_c . However, for some technologies, the ATC may never bottom out, even if the firm has a market share of 100. For example, a song has a fixed cost of creation. Once it is created, however, it can be reproduced on fixed media or streamed at a low and constant marginal cost. As a result, the average total cost of listening to it continues to decline with volume.

⁵⁵ For example, advertising and investment costs might be debited as costs in the year in which they are incurred. Because they have long-lasting effects, economic profits would amortize them over their lifetimes.

Figure 2.1 Minimum efficient scale and minimum viable scale

Note: MVS = minimum viable scale; MES = minimum efficient scale; P_c = competitive price; P_B = break-even profit price; ATC = average total cost.

The MVS is the break-even profit sales level for a given price. It can be high when fixed costs are large. Fixed costs include the sunk costs of entry. Sunk costs are particularly important in creating entry barriers when there is post-entry competition, as discussed below.

If the market price exceeds the perfectly competitive price, the MVS is lower than the MES. At this higher price, entry can be viable even if the entrant's output falls short of the MES, as illustrated in Figure 2.1.

Natural entry barriers from economies of scale arise when there are fixed costs. They lead to a high MES, which may cause an entrant to have an average-cost disadvantage. A high MVS indicates that the entrant cannot profitably enter at a very small scale. A high MVS relative to market size is also likely to lead to price competition, which will cause prices to fall and raise the MVS, as discussed below.

In the limit, a market may be a *natural monopoly*, meaning there is room for only one firm to earn a profit. Natural monopolies occur when the combination of limited market demand and substantial scale economies make a duopoly unprofitable even at the monopoly price. Historical examples include local telephone, electrical, water, and postal services. It was sometimes suggested that services such as computer languages, computer operation systems, transcontinental rail transport, and airline service to small cities as well as production of goods such as aluminum were natural monopolies because of the large scale needed to enter and the inability of the market to support more than one participant. However, thanks to technological change, market growth, and product differentiation, most markets are now able to support multiple brands. Consumer demand and technology may not be able to support a large number of brands, however: "Winner take all" markets are rare, but some markets may be described as "winner take most." Antitrust monopolization cases such as *Google (search)* and *Live Nation/Ticketmaster*, discussed in Part III,

must determine whether technology and demand are the sole causes of market dominance or anticompetitive exclusionary conduct also contributed.

If the quality of the product can be determined only through experience, new entrants must bear a “reputational” cost. They may need to offer lower prices (or even free samples) to new customers to induce them to try a new product. This need acts like a higher variable production cost until the new firm’s reputation is established. Even at the lower price, it may take the entrant time to grow its sales. The cost and time needed to establish a track record of a good-quality product or service serves as a barrier to entry. If entry or growth in sales takes a long time, it will take longer for an entrant to achieve MVS and profitability.

Regulations can delay entry by increasing the time between the creation of capacity and marketing. This delay increases the cost of entry, because expenditures on capacity must be financed before revenue is generated. These delays will give the monopolist a longer time in which to respond aggressively to the entry, which can reduce the profitability of and thus deter entry. Anticipation of such post-entry competition is a natural entry barrier when the entrant has sunk costs, as discussed below.

Long-term contracts that tie up customers for a period of time reduce the ability of entrants to grow sales quickly. They can extend the time required to reach MVS. If all long-term contracts expired at the same time, they would merely delay the moment of competition, and consumers might not be harmed if the long-term contracts have a low fixed price. In contrast, long-term contracts with staggered expiration dates can act as a permanent entry barrier, because staggered expiration dates limit the amount of business an entrant can obtain each year, potentially making entry unprofitable.

To see why, suppose an entrant needs to sell 100 units a year to break even at the pre-entry current price. This break-even scale can be denoted as the MVS. Suppose that the incumbent monopolist is selling 1,000 units per year under 10-year contracts, 10 percent of which come up for renewal each year. The entrant can reach MVS in the first year only if it captures 100 percent of customers whose contracts expire—an achievement that seems unlikely. Even if the entrant captured a third of the available customers, it would take three years to reach MVS. The entrant’s anticipated losses until it reaches MVS represent entry costs.

An incumbent firm with monopoly power might adopt long-term contracts with staggered expiration dates to increase the entrant’s cost of entry. Such contracts are a strategic barrier to entry, as discussed below.

iii. Sunk costs

Sunk costs of entry are costs an entrant must incur that cannot be recovered in the event that entry fails. They include the cost of designing, marketing, and advertising a new product. If the coding done to create a new operating system for mobile phones and tablets cannot be applied to other products if the operating system fails, the costs spent on it are sunk.

Variable as well as fixed labor costs during the pre-entry phase can also be sunk. If entry or reaching MVS takes time, the interim losses are sunk costs. These costs create additional fixed costs that lead to or increase economies of scale.

Not all entry costs are sunk. Airplanes or trash trucks used to service a particular city might easily be transferred to another route or city. Forklifts, ladders, and office furniture can be sold after entry fails; only the depreciation would constitute sunk costs. Although literally sunk in the ground, a crude oil pipeline might be quickly switched over to transport refined petroleum products, such as gasoline, or liquid ammonia.

In other situations, most or all entry costs may be sunk. When a steel mill shuts down, some of its equipment can be sold for scrap, but most of its capital costs will be sacrificed. It might be impossible to convert an automobile assembly line into a one that produces tractors or heavy-duty trucks, but it might easily be converted into one producing light trucks. (If there is a conversion cost, those costs would be sunk.)

Entry into some markets may have relatively low sunk costs. For example, if an airline with a hub in one city decides to begin to serve a new destination, it might be able to rent gate space on a short-term lease; if entry fails, it could use the space for other routes. Aircraft can be used for other routes or leased to others if entry fails. Perhaps the most significant sunk costs in this case would be the advertising of the new route and the losses borne during the period before the entrant airline exits the route.

A key but sometimes misunderstood issue is the role of post-entry competition in affecting barriers to entry. It used to be suggested that the intense competition that occurs in an unconcentrated market itself serves as a barrier to entry and that this observation shows that the harmful competitive effects of entry barriers are overstated. But intense competition is not a true entry barrier, in that it does not support durable monopoly power (i.e., it does not permit a firm to charge above marginal cost for a significant period of time).

Economic analysis reveals a deeper point. In making its entry decision, a rational entrant would focus on the likely post-entry price, not the pre-entry price.⁵⁶ Unless the entrant's likely sales are very low, an incumbent monopolist would have the incentive to reduce its own price in response to entry rather than accommodate the entrant's sales. This competition would reduce the profits of the entrant. Anticipation of this post-entry competition may cause the entrant to fear that it will be unable to cover its costs and will lose its sunk costs when it exits, deterring its entry. Fear of competition is thus a barrier to entry that can permit an incumbent monopolist to maintain supra-competitive prices.

A rational entrant would be willing to incur sunk costs only if it expected to be able to sell sufficient output at a sufficient price to earn break-even profits (i.e., achieve MVS). In estimating whether it is likely to be able to do so when entering a market served by a monopolist, it would not assume that the pre-entry price would continue after its entry occurs if it enters at a significant scale. Instead, it would assume that the incumbent monopolist might respond by cutting its price. The entrant would also estimate the demand for its product and the extent to which it could divert customers away from the incumbent monopolist.

⁵⁶ Joe Bain's seminal 1949 monograph recognized this point. It also introduced the concepts of limit pricing and dynamic demand. Joe S. Bain, *A Note on Pricing in Monopoly and Oligopoly*, 39 AM. ECON. REV. 448 (1949).

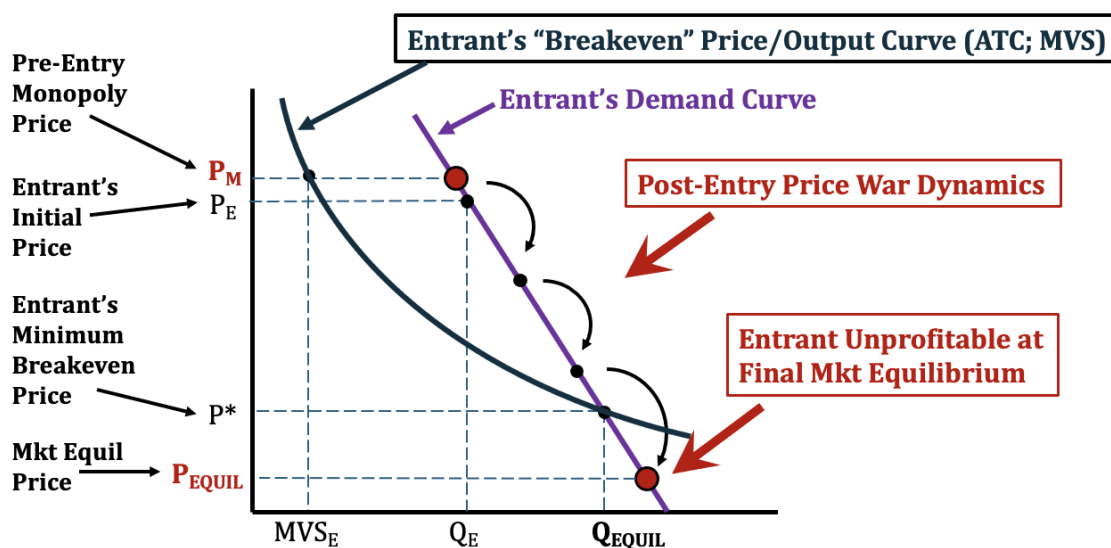
The need to anticipate and take account of post-entry price competition is a key factor in understanding entry dynamics. The entrant's MVS will be higher when the market price is lower, because the entrant's margin of price over cost will be lower. That decrease in the post-entry competitive price increases the entrant's MVS and its need to produce more output to earn a profit.⁵⁷

The dynamic does not stop there. The entrant's increased output in attempting to achieve MVS can lead to further post-entry competitive price reductions by the incumbent monopolist. The upshot may be a post-entry price war that the rational entrant anticipates will ultimately render its entry unprofitable, causing it to lose its sunk costs. If those sunk costs are substantial and there is a significant risk that they will be lost, a rational firm may not attempt entry.

The obvious bottom line is that larger sunk costs increase the risk of a substantial price war, which would lower the entrant's profits and thus reduce its likelihood of entry. It is in this sense that the anticipation of post-entry price competition can be a barrier to entry.

Figure 2.2 illustrates this competitive dynamic. The pre-entry monopoly price is P_M . Initially, the entrant sets a slightly lower entry price, P_E , and sells an entry level output Q_E . If its production significantly increases market output, it may lead to a price response by the monopolist to recover its lost sales. Whether it does or not, the result could be a significant post-entry price reduction. At the post-entry prices, the entrant's MVS is indicated by its ATC. MVS also increases when price falls. When the market settles down and reaches a market equilibrium price (P_{EQUIL}) and quantity (Q_{EQUIL}), P_{EQUIL} may be below the entrant's minimum breakeven price. A price war thus becomes a death spiral for the entrant.

Figure 2.2 Post-entry competition as an entry barrier: Price war death spiral



If a rational entrant were to anticipate this competitive dynamic and the outcome were anticipated, it would recognize that its entry would be unprofitable and that it would not be able to recover its

⁵⁷ Steven C. Salop, *Measuring Ease of Entry*, 331 ANTITRUST BULL. 551 (1986).

sunk costs when it exited. As it would therefore not make economic sense to attempt to enter the market, the monopolist would be able to maintain its monopoly price and profits.

This post-entry competition dynamic explains how a monopolist can maintain supra-competitive prices without attracting entry. This sunk cost barrier to entry can deter entry even by a more efficient entrant, because the entrant's need to bear sunk costs creates financial risk.⁵⁸ The monopolist has a key advantage in the price war, because unlike potential new entrants, it has already borne its sunk costs.

This fear of post-entry price competition can be a very powerful—indeed, prohibitive—barrier to entry. To see why, consider the case of a technology with some sunk initial entry costs, some annual fixed costs, and a marginal cost that is constant over the relevant range of output in the market. Suppose the market is served by a monopolist at the monopoly price. Consider an equally efficient potential entrant with an identical product and technology that has the same technology and costs as the monopolist. Assuming the entrant and monopolist do not collude or reach a mutually advantageous tacit understanding, the fact that the products are identical implies that there would be intense and rapid post-entry price competition all the way down to a market equilibrium price equal to marginal cost. But at that price, both firms would be losing money.

Of course, if this outcome were anticipated, a rational entrant would have no incentive to attempt enter, as it would realize that it would end up losing its fixed costs until it exited and its sunk costs even after exit. In short, where price competition would be most intense and lead to the greatest consumer benefits if it occurred, entry would be deterred and the monopolist would remain unthreatened. And the level of sunk costs does not need to be large to deter entry in this situation.⁵⁹

iv. Entry counterstrategies

The barrier to entry from an anticipated price war might be circumvented if the entrant can obtain enough customers to reach the price and volume for viable production at an MVS (or gain a significant foothold) before bearing its sunk costs. In this situation, it has less to fear from post-entry price competition. This counterstrategy involves gaining advance commitments from some customers to provide a baseload level of sales.

The *U.S. v. Waste Management, Inc.*⁶⁰ merger case involved entry by a Dallas trash collection firm into the adjacent Fort Worth market. The district court suggested that as customer contracts could be

⁵⁸ As the monopolist is already established, its sunk costs of entry are no longer relevant to its behavior.

⁵⁹ For the technical economic models, see Martin L. Weitzman, *Contestable Markets: An Uprising in the Theory of Industry Structure: Comment*, 73 AM. ECON. REV. 486 (1983); Joseph E. Stiglitz, *Technological Change, Sunk Costs, and Competition*, 3 BROOKINGS PAPERS ECON. ACT. (SPECIAL ISSUE ON MACROECON.) 883 (1987). These analyses were originally made to show that the broad “contestable market” claims of William Baumol and his co-authors applied only to the very narrow circumstance in which the entrant could gain its customers before the incumbent could respond and before bearing its sunk costs. The model may have been applicable to the trash collection competition depicted in the Waste Management merger case and perhaps some airline competition but not generally. William Baumol et al., *Contestable Markets: An Uprising in the Theory of Industry Structure*, 72 AM. ECON. REV. 1 (1982); William Baumol et al., *CONTESTABLE MARKETS AND THE THEORY OF INDUSTRY STRUCTURE* (1982).

⁶⁰ *U.S. v. Waste Management, Inc.* (Waste Management), 743 F.2d 976 (2d Cir. 1984).

obtained in advance of entering the market, the cost of leasing additional trucks or obtaining garage space would not have to be borne until the firm obtained sales commitments.

This example points to a more general phenomenon. The risks entailed by the existence of sunk costs give potential entrants the incentive to attempt to obtain future “lead” customers to act as “entry sponsors” before bearing those costs. These lead customers may then commit to purchasing a certain base of output that permits the entrant to begin production. The fact that an important large firm is willing to become a lead customer may give other potential customers the confidence to sign purchase contracts with the entrant. A customer might be willing to become a lead customer to disrupt the market power of a supplier with such power. The Federal Trade Commission’s *Ethyl* case revealed that oil companies sponsored two entrants, Nalco and PPG, to increase competition faced by the initial duopolists, Ethyl and Du Pont.⁶¹

Another entry counterstrategy involves minimizing sunk costs by relying on outside vendors to supply services and other inputs rather than producing them themselves, thereby converting fixed costs into variable costs. In the *McWane, Inc. v. FTC*⁶² monopolization case discussed in Part III, for example, the entrant (Star) purchased a limited number of products from contract manufacturers while its sales were low during the entry phase.

v. The “judo economics” counterstrategy

Another possible counterstrategy would be to enter in a less threatening way—by, say, sharply limiting its capacity or significantly differentiating its product while setting a materially lower price. The combination of the lower price and the fact that its entry would cannibalize fewer sales from the incumbent monopolist can alter the incumbent’s post-entry pricing incentives in a way that is favorable to the entrant. It can give the monopolist the incentive to passively accommodate the entry and accept the loss of a small number of marginal customers rather than significantly reduce the prices charged to all its customers.

This “judo economics” entry strategy can allow the entrant to survive,⁶³ without significantly dissipating the incumbent firm’s monopoly power. After its initial survival, the entrant cannot take the risk of growing beyond this fringe status, because doing so would induce a loss-creating price reaction by the incumbent.⁶⁴ This limited entry and accommodation is possible evidence of monopoly power.

This situation presents an entrant with a dilemma. If it restricts its capacity and ability to challenge the incumbent, it is more likely to be accommodated and survive but less likely to earn substantial profits. If it enters on a larger scale, it can earn higher profits but faces a higher risk of intense price competition—or worse. For example, when Netscape entered the browser market, its founder, Marc

⁶¹ *E.I. Du Pont de Nemours & Co. v. FTC*, 729 F.2d 128 (2d Cir. 1984).

⁶² *McWane, Inc. v. FTC (McWane)*, 783 F.3d 814 (11th Cir. 2015).

⁶³ See Judith R. Gelman and Steven C. Salop, *Judo Economics: Capacity Limitation and Coupon Competition*, 14 BELL J. ECON. 315 (1983); Drew Fudenberg and Jean Tirole, *The Fat-Cat Effect, the Puppy-Dog Ploy, and the Lean and Hungry Look*, 74 AM. ECON. REV. 361 (1984).

⁶⁴ If multiple entrants attempt the same strategy, their cumulative effect will lead to a response that can push them all into negative profit territory.

Andreesen, apparently bragged that his company would reduce Windows to a “poorly debugged set of device drivers.”⁶⁵ This approach poked the bear: After failing to purchase Netscape, Microsoft crushed it.

B. Strategic Entry Barriers

Strategic barriers to entry are barriers erected by incumbent firms to achieve or maintain their market power. They can be created with a wide array of exclusionary conduct, including extreme conduct such as inducing the government to exclude entry, burning down the entrant’s factories, and threatening to murder potential entrants. The exclusionary conduct can also include a variety of other actions that have been alleged in antitrust cases, including the following:

- exclusive contracts with key input suppliers, distributors, and/or customers
- tying arrangements, loyalty discounts, and conditional rebates
- predatory pricing to customers or predatory overbidding for inputs
- the creation of low-cost excess capacity or incompatible products
- most-favored nation and meeting competition contractual provisions

These types of conduct can also be used to create barriers to expansion facing nascent entrants or fringe competitors. Part III discusses various types of strategic entry barriers.

⁶⁵ <https://web.archive.org/web/20060812205515/http://www.ianmurdock.com/>.

Annex 1.A Basic Economics Concepts

This annex outlines the economic concepts that serve as the foundation for analyzing anticompetitive conduct throughout the remainder of this monograph. It presents the tools economists use to analyze how business conduct affects competition. These concepts are not abstract theory. They help practitioners analyze how exclusionary conduct harms rivals, affects competition, and either harms or benefits consumers.

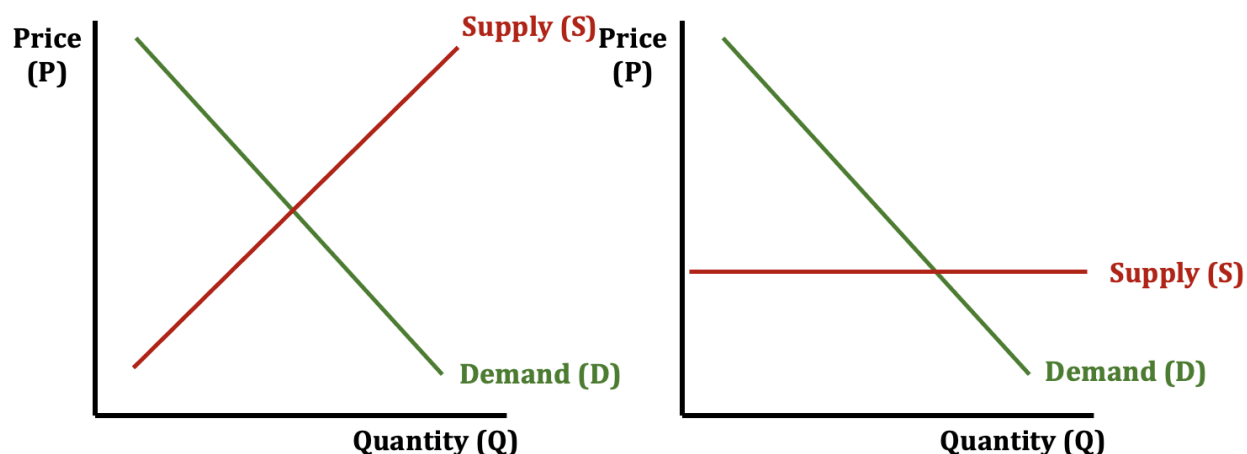
The annex uses simple examples to develop and review the basic economic analysis of consumer willingness to pay, sellers' costs of production and supply, profit maximization, competition, market power, and collusion and exclusion from the bottom up. It also highlights how consumer demand and firm behavior influence each other. This relationship is central to understanding how collusion and exclusion can distort competitive outcomes.

The Economics of Demand and Supply

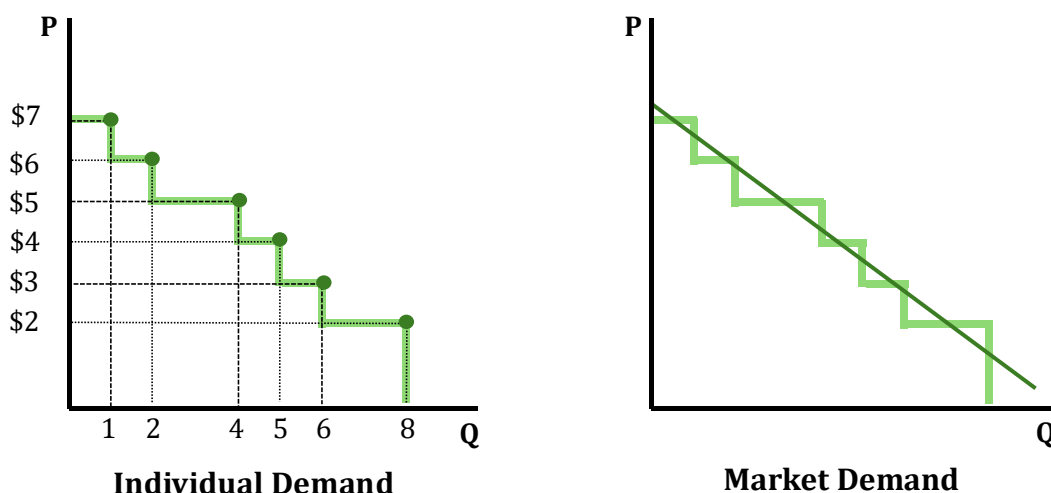
Economics is based on demand and supply, which determine the relationship between price (P) and quantity (Q). Because the "law" of demand indicates that, everything else equal, buyers buy more of a good when the price is lower, the demand curve slopes downward.

Supply curves slopes upward (as in the left-hand panel) when the marginal costs of production increases as more output is produced. If marginal cost is constant, the supply curve is flat (as in the right-hand panel).

Figure 2A.1 Demand curves and supply curves, with upward-sloping and flat supply curves



The market demand curve may look very different from the demand curve of a single individual. Individuals do not reduce their purchases continuously for every small price increase, as suggested by the smooth downward-sloping demand curve. When price rises by a small amount, purchases tend to stay the same until the price rises by a critical amount, at which point purchases fall somewhat. The demand curve is thus actually a series of steps, as shown in the left-hand panel of Figure 2A.2. The smooth demand curve in the right-hand panel reflects what happens when demands by a large number of consumers in a market are summed into a market demand curve.

Figure 2A.2 Individual and market demand curves

An individual's demand curve is a series of steps because it is based on the concept of *willingness to pay* (WTP). The WTP for one unit of a product is the maximum price a consumer would pay rather than forgo that unit of the product and purchase a substitute. Each step in the left-hand panel represents a different WTP for that unit. Together, they show the declining nature of WTP. WTP is assumed to be lower for a larger number of units purchased because pleasure (what economists call *marginal utility*) declines with the volume of a good consumed (the first scoop of ice cream tends to give more pleasure than the second or third; a consumer might therefore be willing to pay \$3 for the first scoop but only \$2 for the second).

A consumer's WTP depends on the prices and qualities of other products available as the next-best alternative. For example, suppose a consumer is shopping for a new car and prefers the Honda to the similar Toyota model. For the Toyota, the consumer prefers the red version over the silver one. Suppose that a consumer prefers to pay \$32,000 for the red model rather than \$30,000 for the silver one. The WTP for the preferred color may change if the price levels are higher. For example, if the price of the silver model is \$35,000 and the red model costs \$2000 more, the consumer might prefer the less expensive silver model.

A key concept in economics is *consumer surplus*. If consumers pay a price that is less than their WTP, they obtain a "net value" equal to the difference between the WTP and the price charged. Say, for example, that a consumer was willing to pay \$150 for a concert ticket. To her delight, she finds a ticket for just \$80. As the ticket was worth \$150 to her and she paid just \$80, she enjoyed consumer surplus of \$70. If the price of the product is equal to the WTP, the consumer is indifferent between purchasing and not purchasing it, because the consumer surplus is zero.

Demand curves normally slope downward. A vertical demand curve means that whatever price is charged (up to some maximum, at which point demand is choked off), purchasers will buy exactly the same quantity. Such a demand curve is referred to as *perfectly inelastic*. Although an individual consumer's demand may be perfectly inelastic, market demand is unlikely to be: A heroin addict in

withdrawal might be willing to pay all the money in his pocket rather than forgo a dose, but all the addicts in a city would have different WTP, so that market demand would not be perfectly elastic.

Producers' Costs and Short-Term Supply

Firms face the costs of production and entry. Some costs are fixed; they must be paid regardless of the level of production. Fixed costs include rent; interest payments on capital costs of entry; salaries to personnel on fixed contracts (managers, executives, and workers that must be hired full time regardless of the firm's level of production); and R&D expenditures.

Other costs vary with the level of production. They include the costs of raw materials; hourly wages of workers whose hours and employment are adjustable or who are paid on a piece-rate basis, energy costs tied to production, shipping costs, and most maintenance. Equipment depreciation is a variable cost if it depends on usage but a fixed cost if it depends on time.

Costs include not only out-of-pocket expenditures but also *opportunity costs*—the cost of a forgone opportunity. To grasp the notion of opportunity cost, suppose that a café called CoffeeStop contracted with its coffee supplier in Brazil to purchase a certain quantity of beans at \$10 per pound, which works out to about \$0.40 per cup. Now suppose that a coffee shortage or tariff doubles the cost of coffee to \$20 per pound. CoffeeStop should now view the opportunity cost of its coffee as \$0.80 per cup, because it now has the opportunity to sell those beans for \$20 per pound rather than use them itself. Every cup of coffee it sells represents a lost opportunity to sell the beans instead.

Suppose that CoffeeStop's variable cost of making a latte includes the cost of the beans and milk, the time it takes the barista to make the drink, the payment card fees charged by the bank, and the cost of maintenance of the machine (which, in this example, depends solely on the number of lattes made) is \$1 per unit. This variable cost does not change with the number of lattes made per day, because each latte uses the same ingredients and takes the same amount of time, credit card fees, and depreciation from the use of the espresso machine. Economists commonly use the term *marginal cost* to refer to the variable cost of each incremental (marginal) unit. In this example, the marginal cost is a constant \$1.

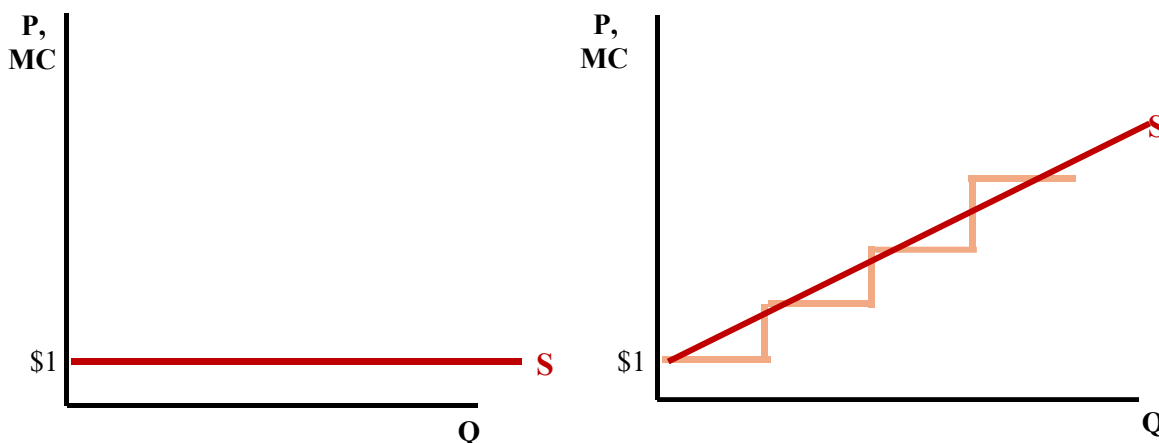
This marginal cost may not be constant at \$1; it may rise or fall as it sells more coffee. If, for example, the shop gets busier, the barista will need to work faster and the café may need to pay the barista an hourly wage premium. The café may also need to hire an additional worker to wash the cups and clean the tables. These additional charges would yield a marginal cost that increases with production, perhaps as a series of rising steps.

Just as a consumer will purchase a unit if its price does not exceed its WTP, a seller facing a constant price will increase its profits by supplying any unit at a price above or even equal to its marginal cost.⁶⁶ If the café had constant marginal costs of \$1, its supply curve would be a flat horizontal line at \$1, as shown in the left-hand panel of Figure 2.A.3. If its marginal cost increases as it sells more, its supply curve would slope upward, as shown in the right-hand panel. Marginal costs may rise in a series of steps as production rises, as shown in the right-hand panel of Figure 2.A.3. If there are multiple sellers in a market, the steps in the market supply curve can result from the differential costs

⁶⁶ The assumption that the firm can sell as much it wants at a constant price is correct only if the firm lacks market power, as discussed below.

of multiple suppliers each of which has a limited capacity captured by the span of its step. As with demand, this stepped industry supply curve is commonly smoothed out as an upward-sloping curve in economics texts, as shown in the right-hand panel. The *elasticity of supply* is the percentage increase in marginal cost (MC) arising from a 1 percent increase in production (Q).

Figure 2A.3 Marginal cost and supply curves



CoffeeStop's supply curve based solely on its marginal (variable) costs represents its short-run supply situation. If it is to maintain short-term variable profits, the market price will need to be at least as high as its marginal cost.

At a price of \$1, CoffeeStop breaks even in terms of variable cost, but it is unable to cover its fixed costs. It would therefore lose money at a price of \$1 and go out of business. Pricing at marginal cost is thus not viable even in the short run when marginal cost is constant and a firm also has fixed costs.

Measuring Profits

A firm's total profit is equal to its total revenue minus its total cost. Revenue is the price times the quantity sold. (Calculating revenue is more complicated if a firm charges non-uniform "discriminatory" prices to different consumers.)

Firms report a number of measures of profit in their accounting statements:

- The *variable profit margin*—commonly used in antitrust—subtracts only variable costs from revenue. It is sometimes expressed as a percentage of revenue, which is then referred to simply as the *price/cost margin*. If a café has monthly revenue of \$18,000 and variable costs of \$12,000, its dollar variable profit margin would be \$6,000 and its price/cost margin 33.3 percent (\$6,000/\$18,000).⁶⁷
- *Gross profits* subtracts fixed as well as variable costs of production but excludes executive salaries and other administrative costs, R&D, and interest.
- *EBITDA* measures earnings before interest, taxes, depreciation, and amortization.

⁶⁷ Accounting statements may also report a profit measure that subtracts fixed production costs like rents and salaries of executives. Another measure might subtract the accounting measures of depreciation costs and R&D costs. Other measures may also be reported or used internally.

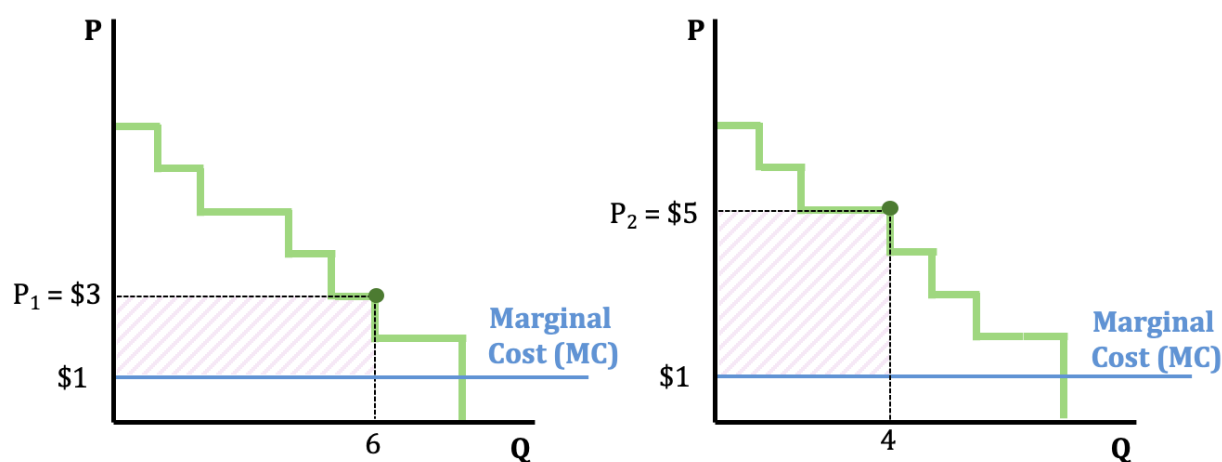
Economic profit equals total revenue minus all economic costs, including the interest on borrowed funds and the opportunity cost of self-financed funds. It is the appropriate measure for assessing whether a firm is viable in the long run or earning supra-competitive returns.

The various measures of accounting profits generally differ from economic profits, for several reasons:

- Economic profits take account of the opportunity costs of capital—the return that could have been earned by using the capital equipment to produce a different product or using it in another way. They also include the opportunity cost of cash invested in the business for working capital to finance production until the goods are sold. This opportunity cost is the financial return the owner would have earned from investing elsewhere (say, in government bonds).
- Accounting profits use measures for the depreciation of equipment that may differ from actual economic depreciation.
- R&D costs may be treated as annual expenses rather than amortized as long-term investments.
- Accounting profits treat all interest payments the same, even though interest paid to finance equipment and other capital expenditures is a fixed cost and working capital used to finance the lag between paying the costs of production and obtaining payment is a variable operating cost.

Economists calculate profits by focusing on the per unit margin of price over variable costs. They then multiply the margin times the number of units sold to calculate variable margin (gross profits). The left-hand panel of Figure 2A.4 adds a line indicating the \$1 marginal (variable) cost (denoted by *MC*). Gross profits are illustrated as the area of the shaded rectangle between the prices $P_1 = \$3$ and \$1 and output between 0 and 6 for a total of \$12 ($6 \times \2). If the café's fixed costs are \$5, the resulting measure—the “net” profit margin—would be \$7 ($\$12 - \5).

Figure 2A.4 Profits and profit-maximization



Maximizing Profits

Antitrust economics and law are generally premised on the notion that firms choose to maximize their profits, by producing the level of price and output that yields the largest possible economic profit.

If a firm had complete information about consumer demand, it would charge every consumer a price equal to the consumer's WTP for that unit of consumption. Economists refer to this scenario as *perfect price discrimination*. At the other extreme, firms may charge a uniform price to all consumers for all units purchased.

In the scenario of uniform prices, the firm must take account of the fact that if it wants to sell more units, it needs to reduce its price on all the units it could have sold at the higher price. As a result, its additional revenue (marginal revenue) will be less than the price it receives for that the marginal unit. The firm's profit will rise if the marginal revenue exceeds its marginal cost.⁶⁸

In Figure 2.A.4, CoffeeStop earns a profit at a $P_1 = \$3$ price. Could it earn even more by charging more? Suppose it raised its price to \$5 a cup, as indicated in the right panel of Figure 2A.3. This price would exceed some customers' WTP, causing them to take their business elsewhere, leading output to fall to four units. Customers whose WTP exceeded \$4 would stay. The shaded rectangle indicates gross profits of \$16 ($4 \times \4), which exceeds the gross profits when price is \$3. Fixed costs are the same at both levels of output. Between these two prices, the profit-maximizing price is \$5.

Market Power, Competition, and Anticompetitive Conduct

A single seller with market or monopoly power can exercise that power to the detriment of consumers by unilaterally raising its price and reducing its output.⁶⁹ A single firm or group of firms may achieve additional market power to raise or maintain supra-competitive prices through collusive or exclusionary conduct.

Market Power and Monopoly Power

In the example above, CoffeeStop had some pricing discretion. When it raised its price from \$3 to \$5, it retained some customers. The ability and incentive to profitably raise or maintain price above the competitive level is known in economics as *market power*. In a market with perfect competition, a firm could not profitably raise its prices. If it did, it would lose 100 percent of its sales. If a firm does not lose all of its sales when it raises its prices, it is said to have some market power. This market power may be very small or very substantial.

Antitrust cases often use the term *competitive price* loosely, to refer to the lower, more competitive price that would result absent an anticompetitive restraint. Microeconomics defines the competitive

⁶⁸ When the firm's demand curve is downward sloping, its marginal revenue declines the more units it sells. A profit-maximizing firm will sell more units (and reduce the price) until it reaches the output level at which marginal revenue is equal to marginal cost.

⁶⁹ A single buyer (or cooperating group of buyers) with monopsony power in an input market (including the labor market) can exercise that power to the detriment of input suppliers (including workers) by unilaterally reducing its price and input purchases. This monopsony conduct will normally lead to less output and higher prices.

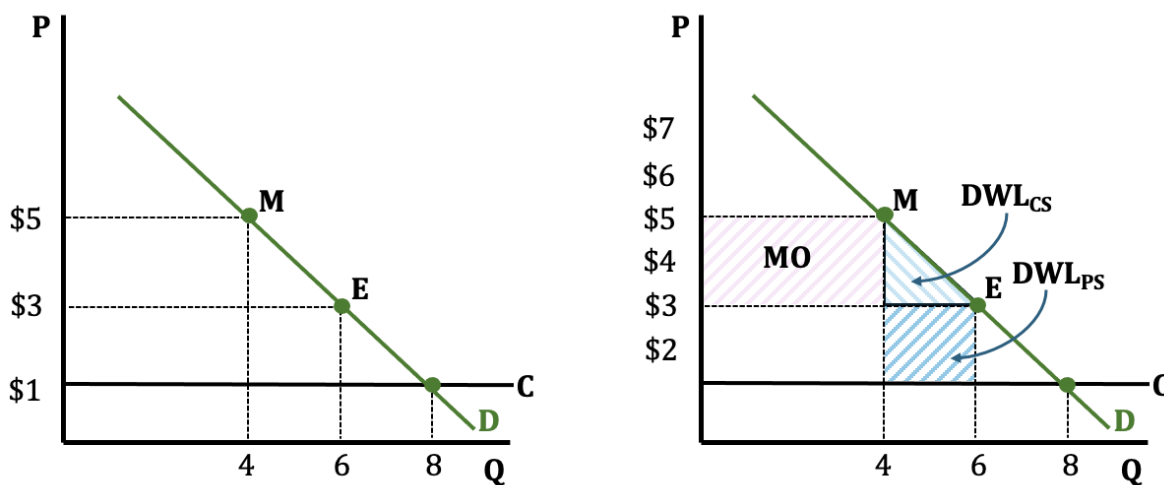
prices as the market price that occurs in a perfectly competitive market that is made up of small (atomistic) sellers who lack any discretion to control the market price. If all firms are identical, the competitive price is equal to the firms' common marginal cost.⁷⁰ Each firm earns a zero price/cost margin on the last (marginal) unit it produces; firms with lower costs earn positive competitive profits on their other consumers with higher WTP. Those consumers are termed *infra-marginal*, because they are not at the margin.

Few markets are perfectly competitive. Antitrust cases involve the conduct of firms that have some degree of market power as a result of scale economies or other technological factors. A firm does not automatically violate the antitrust laws simply by having market or even monopoly power. Antitrust analysis instead focuses on the impact of the defendant's conduct on its market (or monopoly) power and profit-maximizing price, not the defendant's degree of market (or monopoly) power absent the allegedly anticompetitive conduct.

Harms Caused by Market Power

Market (or monopoly) power directly harms consumers in two direct ways, as illustrated by the following example. Suppose that CoffeeStop initially charges \$3 a cup, because it faces competition from another café and fears that some of its patrons would go there instead if it raised its prices. After CoffeeGo goes out of business, CoffeeStop's profitably raises its price to \$5, as shown in Figure 2A.5.

Figure 2A.5 Effect of market power on consumers



Note: E = initial competitive outcome; M = monopoly outcome; C = cost; DWL_{CS} = deadweight loss in consumer surplus; DWL_{PS} = deadweight loss in producer surplus; MO = monopoly overcharge.

⁷⁰ If the firms' marginal costs differ, the competitive price is equal to the marginal cost of the least efficient firm in the market. The lower-cost firms then earn some profits, which are considered competitive profits, not market power profits. Historically, such profits were termed rents or quasi-rents, to distinguish them from supra-competitive profits earned by a firm with market power. That usage has generally disappeared.

The price increase from the initial equilibrium price of \$3 to the monopoly price of \$5 causes output to fall from six units to four, because the new price exceeds some customers' WTP. These two points on the demand curve are labelled E and M in Figure 2A.5.

The right-hand panel of Figure 2A.5 provides a deeper dive. Consumers whose WTP exceeds the new price of \$5 continue to purchase coffee, but they now pay more coffee than they used to. Economists refer to the increase as a *monopoly overcharge*. It is represented by the rectangle labelled *MO*. It has an area of \$8 ($4 \times \2). These consumers' losses are CoffeeStop's gains. For this reason, economists sometimes refer to overcharge as a *monopoly transfer* of consumer surplus.

The two consumers with WTP above \$3 but below \$5 no longer purchase at the price of \$5. They no longer obtain the consumer surplus they obtained at \$3. This *deadweight loss in consumer surplus* (DWL_{CS}) is represented by the cross-hatched triangle. It is called a deadweight loss because it is not captured as higher profit the way the *MO* is. The two units lost have different WTP. With this rising demand curve, the DWL_{CS} is a triangle with height of \$2 and width of two units. Its area is thus \$2 ($\frac{1}{2} \times 2 \times \2).

Given its marginal cost of \$1, when CoffeeStop raises its price from \$3 to \$5, it forgoes the profits it had been earning on the two units that are no longer purchased. This profit-sacrifice is equal to \$4 ($\2×2). It is illustrated as the cross-hatched rectangle labelled DWL_{PS} . It is called a *deadweight loss in producer surplus (profits)* because it is not captured by anyone.

When CoffeeStop raises its price from \$3 to \$5, its profits rise from \$12 ($6 \times \2) to \$16 ($4 \times \4 profit on each), an increase of \$4. The increase in profits is equal to the *MO* of \$8 less the DWL_{PS} of \$4. But consumers lose \$10 in all (the *MO* of \$8 plus the DWL_{CS} of \$2). The \$6 difference between the increase in CoffeeStop's profits and the loss to consumers represents a loss of total surplus equal to the DWL_{CS} of \$2 plus the DWL_{PS} of \$4.

That DWL_{PS} occurs because CoffeeStop charges a single price to all its consumers. If it had been able to charge every customer a price equal to that customer's WTP (perfectly price discriminate), its profits would have been higher. With perfect price discrimination, CoffeeStop would extract all the consumer surplus from its customers. Total surplus would be maximized, but all the wealth would flow to CoffeeStop and none to consumers.

Competition, Collusion, and Coordination

Suppose that a new café, CoffeeGo, opens across the street from CoffeeStop and that there are no other cafés nearby, so that these two firms comprise a duopoly café market. Suppose that when each charges \$3, each sells three lattes and earns variable profits of \$6. If both of them simultaneously raise their prices to \$5, neither would lose sales to the other, but consumers would purchase fewer lattes. Suppose each would sell two lattes a day, earning gross profits of \$8 ($2 \times \4). If they could legally and practically cooperate, they would agree to charge \$5 instead of \$3.

Suppose they do so. CoffeeStop might then realize that if it lowered its price back to \$3 while CoffeeGo continued to charge \$5, it would capture all five units and its profits would rise to \$10 ($5 \times \2). CoffeeGo's sales would fall to one unit and its profits to \$4 ($1 \times \4). CoffeeGo would reach the same conclusion.

Figure 2A.6 sets out the profits for the two companies for the different price combinations. It has the configuration of the famous prisoner's dilemma. The left-hand panel shows CoffeeStop's profits for the different combinations of its price (the rows) and CoffeeGo's price (the columns). The right-hand panel shows CoffeeGo's profits. The best outcome occurs when both cafés charge \$5 and earn profits of \$8. They would like to avoid the competitive outcome when both charge \$3 and earn \$6. The off-diagonal outcomes explain why it can be hard to achieve the high price outcome.

Figure 2A.6 Competition, coordination, and the prisoner's dilemma

		C-Go	
		\$5	\$3
C-Stop	\$5	\$8	\$4
	\$3	\$10	\$6

CoffeeStop Profit Matrix

		C-Go	
		\$5	\$3
C-Stop	\$5	\$8	\$10
	\$3	\$4	\$6

CoffeeGo Profit Matrix

Suppose they do. CoffeeStop would be tempted to cut its price to \$3, which would increase its profits to \$10. At that point, CoffeeGo would feel like the sucker, as its profits fall to \$4. It would therefore have the incentive to match the price reduction to \$3, which would raise its profits to \$6. Even if CoffeeStop resisted the temptation to cut its price, CoffeeGo would be similarly tempted, which would drive the two firms to the competitive outcome. For this reason, the \$5, \$5 outcome might be termed “win/win,” the \$3, \$3 outcome termed “lose/lose,” and the \$3, \$5 outcome termed “temptation” for the low-price firm and “sucker” for the high-price firm.

How can the two firms achieve the win/win outcome that maximizes their joint profits and avoid the profit-dissipating competitive outcome? One possibility is for CoffeeStop to call or email CoffeeGo and try to reach an explicit agreement in which they agree to raise prices to \$5. But doing so would raise the risk that the Justice Department would detect the price fix and file a criminal case that would potentially subject them to fines and private actions to recover treble damages for the \$2 overcharge.

Alternatively, CoffeeStop might adopt a strategy in which it raises its price to \$5 but then quickly drops it back to \$3 if CoffeeGo does not match. But if CoffeeGo takes the hint and raises its own price to \$5, CoffeeStop would quickly follow. As their prices are public and can easily be changed every day, the repetitive back-and-forth pricing choices might lead them to reach a stable equilibrium at the “win/win” price of \$5. For example, this outcome might be achieved simply by one café following a tit-for-tat pricing strategy of charging whatever price the other does. This would not involve an agreement so it would not comprise illegal price fixing. However, certain announced strategies might be treated as facilitating a tacit agreement, as discussed in Part II.

Anticompetitive Exclusion

As an alternative way to get prices up to \$5 and increase its profits, CoffeeStop might try to design and implement an exclusionary conduct strategy against CoffeeGo that would allow it to raise its own prices without losing sales to CoffeeGo. Suppose, for example, that the cousin of CoffeeStop's owner is an organized crime member who demands that CoffeeGo pay him a \$2.50 "tax" on each cup of coffee for "insurance protection" from being firebombed. If CoffeeGo pays up, its marginal cost would increase by \$2.50, which would lead it to increase its price, in order to pass on at least part of the cost increase to its customers. Suppose its profit-maximizing strategy is to raise its price by \$2 (to \$5) to partially compensate for its \$2.50 higher marginal costs. CoffeeStop might stick with the \$3 price and earn profits of \$10, or it might decide to match the \$5, which would yield more profits for the cousin and incentivize him to continue bearing the risk of arrest for the extortion. The higher prices would harm customers, and output would fall.

Noncriminal exclusionary conduct can sometimes achieve the same outcome. CoffeeStop might raise CoffeeGo's costs by striking an exclusive supply contracts with the major coffee suppliers or even paying them not to sell to CoffeeGo. It might engage in deceptive advertising that attacks the quality or purity of CoffeeGo's drinks. It might buy the building that houses CoffeeGo and refuse to renew its lease. Part III analyzes such exclusionary conduct in detail.