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ECONOMIES OF SCALE: WEIGHING OPERATING EFFICIENCY WHEN ENFORCING ANTITRUST LAW

"[I]t has been the law for centuries that a [person] may set up a business in a country town too small to support more than one, although thereby . . . [intending] to ruin some one already there and [succeeding in that] intent. In such a case [the competitor] is not held to act 'unlawfully and without justifiable cause' . . . The reason, of course, is that the doctrine generally has been accepted that free competition is worth more to society than it costs, and that on this ground the infliction of the damage is privileged."*


Introduction

Economists have long recognized the antitrust dilemma that it is impossible to promote perfect competition when large economies of scale are present. Because economists generally believe that antitrust policy should reinforce the achievement of scale economies, they encourage only workable competition when large scale economies exist. Courts, although traditionally emphasizing populist goals in antitrust enforcement, such as protecting small business, recently...
also have emphasized economic values when interpreting antitrust law, including increased tolerance of aggressive business competition. As a result, courts faced with a choice between limiting the size of a firm to achieve a competitive market structure and preserving and protecting operating efficiency are increasingly likely to protect efficiency.

Even the National Commission for the Review of Antitrust Laws and Procedures, which rejects standard rule of reason analysis, expressly suggests efficiency as the sole defense to a proposed no-fault actual monopolization charge. To be meaningful,
however, legal standards based on efficiency concepts must more carefully consider the work of economists.9

This Note argues that scale economies should be considered when determining liability and relief under section 2 of the Sherman Act.10

complex cases and... proposals for making the remedies available in such cases more effective.'” Id. at 143 (footnote omitted) (quoting Exec. Order No. 12,022, § 2(a)(1), 3 C.F.R. 155-56 (1977 Compilation), as amended by Exec. Order No. 12,032, 43 Fed. Reg. 15,133 (daily ed. Apr. 11, 1978)). The National Commission felt “that doctrinal changes in antitrust should be made primarily on the basis of their relationship to the fundamental goals of antitrust—including economic efficiency, consumer welfare, and dispersion of social, economic, and political power—rather than solely, or even mainly, for purposes of expediting litigation or making relief more effective.” Id. at 143 (emphasis added). The Commission’s no-fault proposal would require divestiture once persistent monopoly power was shown unless divestiture was shown to destroy substantial scale economies or benefits accruing from a patent. Id. at 152.

9. Enforcement of the antitrust laws should be aimed at controlling imperfections in the free market system. R. Bork, supra note 2, at 7 (“[T]he only legitimate goal of antitrust is the maximization of consumer welfare.”); C. Kaysen & D. Turner, supra note 3, at 3-5 (only in the context of a free market system is it worthwhile to emphasize antitrust policy). Rational trade regulation policy mandates the application of sound economic analysis to antitrust cases. See R. Bork, supra note 2, at 4, 7. “[R]ules [of law] that significantly impair both competition and the ability of the economy to produce goods and services efficiently [have been made by the courts based] on demonstrably erroneous notions of the economics that guide the law. . . . Unless the theory of antitrust is understood and the law brought into line with it, the law will [become] even more unnecessarily restrictive of business freedom. . . . A consumer-oriented law must employ basic economic theory to judge which market structures and practices are harmful and which beneficial.” Id. at 4-7. Indeed, economic analysis has taken an increasingly prominent role in antitrust law. L. Sullivan, Handbook of the Law of Antitrust § 1, at 1-2, 8-9 (1977) (“Habits of thought, techniques of analysis, and value preferences derived from economics have come increasingly to play a substantial part in the development and application of the law. Today, one interested in antitrust cannot ignore economics. . . . Increasingly . . . courts have turned toward theoretical economics for insight and aid in the development of antitrust doctrine.”). But see R. Bork, supra note 2, at 4-5 (an irrational argument has been advanced that antitrust law should ignore economics. . . . Increasingly . . . courts have turned toward theoretical economics for insight and aid in the development of antitrust doctrine.”). Note, Potential Production: A Supply Side Approach for Relevant Product Market Definitions, 48 Fordham L. Rev. 1199, 1204 n.22 (1980) (hereinafter cited as Potential Production] (“Judges, not economists, decide antitrust law. Case analysis, therefore, is the proper starting point.”); L. Sullivan, supra, § 1, at 7-8 (“[C]ourts can only function effectively in areas where the applicable values are clearly and authoritatively identified and where critical factual questions are sufficiently determinate so that use of the ordinary devices for judicial inquiry, characterization, rule making and rule application will yield results which are predictable and which demonstrably turn on principles of general application.”).

10. Section 2 of the Sherman Act provides that “[e]very person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony.” 15 U.S.C. § 2 (1976) (emphasis added).
and section 7 of the Clayton Act. The Note begins with a discussion of economic theory relating to scale economy concepts—the relationship of these concepts to economic goals, the various types of scale economies, and the measurement of these economies. This economic theory is next applied in an antitrust context. Scale economy concepts already are controlling in cases in which their economic effect is clear. When their effect is less clear, scale economy concepts are still useful for determining whether a firm has market power, whether aggressive business acts are justified by market structure, and whether an action has a net procompetitive effect.

I. Economic Treatment of Economies of Scale

A. Underlying Economic Theory

Scale economies are decreases in per unit cost resulting from increases in quantity produced or distributed. They are one aspect of

11. Section 7 of the Clayton Act provides that "[n]o corporation shall acquire, directly or indirectly, the whole or any part of the stock . . . other share capital [or] . . . the whole or any part of the assets of one or more corporations engaged in commerce, where in any line of commerce in any section of the country, the effect of such acquisition . . . may be substantially to lessen competition, or tend to create a monopoly." 15 U.S.C. § 18 (1976) (emphasis added). This Note only considers scale economies in the context of § 2 and § 7. Scale economies may also be relevant in cases involving § 1 of the Sherman Act, 15 U.S.C. § 1 (1976) ("Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is . . . declared to be illegal . . . .") (emphasis added)), § 1(f) of the Robinson-Patman Act, 15 U.S.C. § 13(f) (1976) ("It shall be unlawful for any person engaged in commerce, in the course of such commerce, knowingly to induce or receive a discrimination in price which is prohibited by this section." (emphasis added)), § 5 of the Federal Trade Commission Act, 15 U.S.C. § 45 (1976) ("unfair methods of competition in . . . commerce, and unfair or deceptive acts or practices in . . . commerce, are declared unlawful" (emphasis added)), § 3 of the Clayton Act, 15 U.S.C. § 14 (1976)("It shall be unlawful for any person engaged in commerce, in the course of such commerce, to lease or make a sale or contract for sale of goods, wares, merchandise, machinery, supplies or other commodities, whether patented or unpatented, for use, consumption or resale within the United States . . . where the effect of such lease, sale, or contract for sale or such condition, agreement, or understanding may be to substantially lessen competition or tend to create a monopoly in any line of commerce." (emphasis added)).

12. Scherer, Economies of Scale and Industrial Concentration [hereinafter cited as Scherer I], in Industrial Concentration: The New Learning 16, 16 (H. Goldschmid, H. Mann, & J. Weston eds. 1974) [hereinafter cited as Industrial Concentration]; see F. Scherer I, supra note 4, at 81; cf. P. Samuelson, supra note 1, at 28 ("[e]conomies or savings come into full play only when a large enough number of units is being produced to make it worth while to set up a fairly elaborate productive organization" (emphasis omitted)); Stigler, The Economies of Scale, 1 J.L. & Econ. 54, 54 (1958) ("The theory of economies of scale is the theory of the relationship between the scale of use of a properly chosen combination of all productive services and the rate of output of the enterprise.").
what economists term operating efficiencies.  

13. Optimal scale is achieved when size permits long run average total cost to be at a minimum; minimum optimal scale is achieved at the smallest size that permits these average total costs.  

14. Economists define the long run as that period in which plant and equipment are not fixed so that all inputs are variable. E. Mansfield, supra note 1, at 180. The long run average total cost curve shows the minimum cost per unit of producing at each output level. Connecting the minima for each short run average cost curve for each size plant approximates the shape of the long run average total cost curve. Id. at 180-82; P. Samuelson, supra note 1, at 469. Decreases in long run average total cost are due to increasing returns to scale (for example, when a doubling of all inputs leads to more than a doubling of output); increases are due to decreasing returns to scale (for example, when a doubling of inputs leads to less than a doubling of output); constant long run average total costs are due to constant returns to scale. Increasing returns to scale result from the ability to use techniques not possible at smaller scale, benefits of scale that accrue geometrically, and greater specialization. Decreasing returns to scale are generally believed to result from the difficulties of coordinating a large enterprise. E. Mansfield, supra note 1, at 142-43, 184-85; F. Scherer I, supra note 4, at 82.

15. J. Bain, Barriers to New Competition 53 (1956); Scherer I, supra note 12, in Industrial Concentration, supra note 12, at 17.

16. J. Bain, supra note 15, at 57; F. Scherer I, supra note 4, at 104.
confer real resource savings, resulting in an actual welfare benefit to society. 17 "Strictly pecuniary" economies result in monetary savings to a firm with market power but no overall welfare benefits to society because they reflect no physical resource saving. 18

The achievement of real economies is a policy reason for incorporating scale economy concepts into antitrust law. 19 Specifically, because firms will remain viable in a competitive market only if they minimize costs and operate at efficient scale, 20 antitrust law should reinforce competitive market structures to the extent that scale economies permit. 21 Without this reinforcement, resources may be wasted and cost saving techniques may not be vigorously pursued. 22

Scale economy concepts can be used to determine how antitrust enforcement can promote both competition and operating efficiency in markets in which the two goals conflict. Rational trade regulation policy should encourage firms to achieve the efficiencies inherent in operating at minimum optimal scale and avoid creating markets so atomized that scale economies are lost. Economists generally agree that scale economies determine what level of production is efficient, as illustrated by the long run average total cost curve. 23 Some economists argue that average total cost will eventually increase with size (U-shaped curve), while others argue that once minimum optimal scale is achieved, long run average cost is constant over a wide range of output (L-shaped curve). 24 Although greater flexibility in antitrust

![Graph: L-Shaped Curve and U-Shaped Curve]

17. J. Bain, supra note 15, at 57.
18. Id. A large firm may receive quantity discounts in advertising or on other goods purchased, or may have reduced costs of capital. Although real economies, like the ability to bypass intermediaries, may occur, the more pronounced result is strictly pecuniary economies accruing to the firm because of its market power. Such economies do not benefit society.
19. Id.
20. 2 P. Areeda & D. Turner, supra note 1, ¶ 402b2 ("Firms that fail to operate at lowest cost may temporarily break even or even make modest profits when demand is high, but will incur losses and eventually disappear as resources commanded by more efficient firms move into the market."); E. Mansfield, supra note 1, at 265-66 (monopoly markets are scrutinized because they lack natural market forces).
21. 2 P. Areeda & D. Turner, supra note 1, ¶ 408a.
22. 2 P. Areeda & D. Turner, supra note 1, ¶ ¶ 403b, 403c.
23. See note 14 supra and accompanying text.
24. E. Mansfield, supra note 1, at 185; F. Scherer I, supra note 4, at 84-85; Dewey, The New Learning: One Man's View, in Industrial Concentration, supra note 12, at 1, 5-6. This disagreement as to the shape of the long run average total cost curve can be graphically illustrated.
enforcement may result if a market has an L-shaped cost curve, in either case, scale economies would be destroyed by legal constraints that force a firm to operate at less than minimum optimal scale. Thus, scale economies constitute structural limitations on antitrust enforcement because efficiencies are sacrificed when a firm operates at less than minimum optimal scale.

Scale economy concepts also are useful to determine whether a firm has market power. When minimum optimal scale constitutes a large percentage of the market and unit costs rise significantly at less than minimum optimal scale, scale economies constitute a barrier to entry. Because a potential entrant will anticipate either higher

Figure (a) illustrates an L-shaped long run average total cost curve. If this is indeed the shape of the curve, optimal scale would exist over a broad range of output levels. For example, both output Q₁ and Q₄ would be optimal. Figure (b) illustrates a U-shaped curve. Only output level Q₃ is optimal if the curve is U-shaped. For a discussion of how the shape of the curve determines whether a natural monopoly exists, see note 72 infra and accompanying text.

25. See note 14 supra and accompanying text.

26. J. Bain, supra note 15, at 53. Bain states that "[t]his fraction should be considered significant if its addition to going industry output (or the addition of a fraction at which costs are not significantly higher) will result in a reduction of industry selling prices which is notable to established sellers in the sense of being distinguishable from the effects of small random variations in market conditions, which is identifiable as the result of the output increment in question, and which is large enough to be felt." Id.

27. Record at 2332-36, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y. Jan. 17, 1969) (direct testimony of Frederick Scherer); Defendant's Exhibit 7643, at 33-34, id. (deposition of William Baumol); Defendant's Exhibit 7645, at 108, id. (deposition of Sam Peltzman); Defendant's Exhibit 7648, at 47-48, id. (deposition of George Stigler); Mancke Deposition Exhibit 8100-017, Nov. 20, 1980, at 767, id. (analytical narrative of Richard Mancke, defendant's witness); J. Bain, supra note 15, at 53-113. Conditions of entry are defined by Bain as "advantages of established sellers in an industry over potential entrant sellers, [evidenced by the ability of] established sellers [to] persistently raise their prices above a competitive level without attracting new firms to enter the industry." Id. at 3 (emphasis omitted); see G. Stigler, The Organization of Industry 67 (1968) (a barrier to entry exists when insiders have a long-run cost advantage over new entrants). Although barriers to entry should be relevant in antitrust litigation as indicia of market power, courts primarily rely on market share figures to gauge market power. See, e.g., United States v. Grinnell Corp., 384 U.S. 563, 571 (1966); United States v. Von's Grocery Co., 394 U.S. 270, 272 (1966); United States v. Continental Can Co., 378 U.S. 441, 458-62 (1964); United States v. Philadelphia Nat'l Bank, 374 U.S. 321, 363 (1963). See generally Potential Production, supra note 9, at 1199 n.2. Courts considering entry barriers have utilized a practical approach that evaluates whether a "real threat" of entry exists. United States v. Pabst Brewing Co., 384 U.S. 546, 560-61 (1966) (Harlan, J., concurring). A "real threat" of entry exists only if experienced people in the business conclude that the difficulties of entry are not insurmountable. Moreover, a potential entrant must be able to enter easily and become a competitor in the market within a reasonable time. See id. Barriers to entry have also been used to define the relevant market. United States v. Pabst Brewing Co., 384 U.S. 546, 558-61 (1966)
costs or lower prices when these high barriers to entry are present, those already in the market possess significant market power.\(^{25}\)

(Harlan, J., concurring); see Potential Production, supra note 9, at 1211 n.70. Finally, raising entry barriers has been used as proof of anticompetitive conduct. United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 343-45 (D. Mass. 1953), aff’d per curiam, 347 U.S. 521 (1954); see FTC v. Procter & Gamble Co., 386 U.S. 558, 579 (1967); American Tobacco Co. v. United States, 328 U.S. 781, 810-11 (1946); A.C. Spalding & Bros. v. FTC, 301 F.2d 585, 620 (3d Cir. 1962); United States v. Aluminum Co. of Am., 148 F.2d 416, 425-26 (2d Cir. 1945); SmithKline Corp. v. Eli Lilly & Co., 427 F. Supp. 1089, 1120 (E.D. Pa. 1976), aff’d, 575 F.2d 1056 (3d Cir. 1978); FTC v. Procter & Gamble Co., 386 U.S. 568, 579 (1967); American Tobacco Co. v. United States, 328 U.S. 781, 810-11 (1946); A.C. Spalding & Bros. v. FTC, 301 F.2d 585, 620 (3d Cir. 1962); United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 344 (D. Mass. 1953), aff’d per curiam, 347 U.S. 521 (1954); United States v. Hartford-Empire Co., 46 F. Supp. 541, 615 (N.D. Ohio 1942), modified, 323 U.S. 386 (1945); 2 P. Areeda & D. Turner, supra note 1, ¶ 409b, 409c; L. Sullivan, supra note 9, § 23; Disner, Barrier Analysis in Antitrust Law, 58 Cornell L. Rev. 862 (1973); Williamson, Dominant Firms and the Monopoly Problem: Market Failure Considerations, 85 Harv. L. Rev. 1512, 1520 (1972). No distinction will be made between the proof requirements for establishing scale economies as a barrier to entry, or as a defense, under § 2 and § 7. Courts seem more likely, however, to resolve ambiguities in favor of the defendant in § 2 cases and in favor of the government in § 7 cases. United States v. Aluminum Co. of Am., 91 F. Supp. 333, 345 (S.D.N.Y. 1950) (courts more likely to invalidate an unconsummated merger (§ 7) than to order divestiture of a company (§ 2)); J. Bain, supra note 15, at 54-55; see Justice Department’s Antitrust Guide Concerning Research Joint Ventures, [1980] Antitrust & Trade Reg. Rep. (BNA), No. 992, 4 (Spec. Supp. Dec. 4) (explicitly recognizing “high optimal scale of production” as a barrier to entry). But see Fisher Deposition Exhibit 8101-001, Dec. 4, 1960, at 363, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y., filed Jan. 17, 1969) (Although static economies of scale, as may occur in manufacturing, can provide barriers to entry, scale economies in research and development generally cannot.); 2 P. Areeda & D. Turner, supra note 2, ¶ 409b (because conforming with scale economies evidences competitive behavior, scale economies should not be used to show a barrier to entry); G. Stigler, supra, at 67-70 (no barrier to entry is present if the established firm has the same costs as the entering firm will have once it attains efficient scale). This Note expressly adopts the views of Bain because Stigler and Areeda and Turner intermesh two distinct uses of scale economy concepts that are best kept analytically separate. Scale economies can prove barriers to entry, a structural element, and evidence competitive practices, a conduct element. See notes 65-67 infra and accompanying text. Moreover, if Stigler’s view were accepted, established firms could charge prices above the competitive level over long periods before new entry could exert a competitive force. Weiss Deposition Exhibit 8103-001, Feb. 1, 1981, at 29, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y., filed Jan. 17, 1969) (analytical narrative of Leonard Weiss, plaintiff’s witness). Fisher argues that scale economies in research and development cannot constitute entry barriers because technological innovations by larger firms can be imitated by smaller firms. Thus, even if a firm would need a significant share of the market to support large research and development facilities efficiently, additional effective competitors could rely on innovation. This view is faulty in suggesting that a firm that relies on its competitors for innovation could ever be an effective competitor. Further, patent and trademark laws are designed to protect the fruits of innovation from competitors.

B. Measurement of Scale Economies

Although measurement of scale economies by empirical techniques is difficult and imprecise, economists have developed various measurement techniques. Because the validity of the measure depends on the type of scale economy being considered, an understanding of the various types of scale economies must precede discussion of measurement techniques. For purposes of antitrust enforcement, it is important to determine which measurement techniques best measure real economies as opposed to strictly pecuniary economies.

Real economies usually relate directly to a production or distribution process, and may be product-specific, plant-specific, or firm-specific. Product-specific, plant-specific, and firm-specific economies focus on various types of business behavior. Product-specific economies are associated with the volume of any single product made and sold. Examples of product-specific real economies are savings in machine running time, operator attendance time, and machine set-up time that result from production of large quantities of a specific product. A less quantifiable product-specific scale economy is the experience and learning gained by management and workers after producing a large volume of a specific product. Plant-specific real economies are the decline of production and distribution unit costs as

29. Record at 2394-96, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y. filed Jan. 17, 1969) (direct testimony of Frederick Scherer); Fisher Deposition Exhibit 8101-001, Dec. 4, 1980, at 378, id. (analytical narrative of Franklin Fisher, defendant's witness); Mancke Deposition Exhibit 8100-017, Nov. 20, 1980, at 768, id. (analytical narrative of Richard Mancke); Smith, Survey of the Empirical Evidence on Economies of Scale, in Business Concentration and Price Policy 213, 215, 223 (1955) [hereinafter cited as Business Concentration]. Because output of plants and firms is usually heterogeneous, measuring the size of economies of scale in empirical studies is very difficult. Saving, Estimation of Optimum Size of Plant by the Survivor Technique, 75 Q.J. Econ. 569, 570-72, 597 (1961) (estimating optimum size is difficult because plants produce various products at various rates with various degrees of vertical integration, and it is difficult to define the relevant industry in which such variety exists.).

30. F. Scherer I, supra note 4, at 104.

31. Id. at 81, 104; Asch, supra note 2, at 130-34; Dewey, supra note 24, in Industrial Concentration, supra note 12, at 4-7; McGee, Efficiency and Economies of Size, in Industrial Concentration, supra note 12, at 55, 58-61; Mueller, The New Antitrust: A 'Structural' Approach, 1 Antitrust L. & Econ. Rev. 87 (1967). Some economists identify types of operating efficiency other than product-specific, plant-specific, or firm-specific. R. Bork, supra note 2, at 105 ("Economies of scale, specialization of function, ability to obtain capital, management skill—all of these and many more elements . . . are causes . . . of efficiency."); Leibenstein, supra note 13, at 392 (motivation is the major element of operating efficiency).

32. See F. Scherer I, supra note 4, at 81; McGee, supra note 31, at 57, 58.

33. F. Scherer I, supra note 4, at 82; Haldi & Whitcomb, Economies of Scale in Industrial Plants, 75 J. Pol. Econ. 373, 383 (1975).
plant capacity and production increase. Costs decline partially because of the ability to specialize factors of production. Examples of real plant scale economies include lower unit costs in initial investment, supervision and management, maintenance, and energy consumption. Firm-specific real economies are the decline in production and distribution unit costs as firm size increases. Examples of firm scale economies include lower unit costs resulting from specialization, massed reserves, and research and development.

The four techniques most commonly used by economists to measure scale economies and statistical cost studies, engineering studies, profitability studies, and survivorship studies. Statistical cost stud-

34. J. Bain, supra note 15, at 57; F. Scherer I, supra note 4, at 82-83; McGee, supra note 31, at 58.
36. Haldi & Whitcomb, supra note 33, at 378-81, 383. Initial investment cost, and consequently, the amortized portion of total cost, exhibits increasing returns to scale, that is, declining unit costs as quantity increases, up to the largest plants observed empirically. Id. at 383.
37. J. Johnston, Statistical Cost Analysis 23 (1960); Haldi & Whitcomb, supra note 33, at 382-83; cf. Selection of Materials Submitted to the National Commission for the Review of Antitrust Laws & Procedures, 48 Antitrust L.J. 891, 894-95 (statement of Robert Bork) (Efficient management is the most important type of production efficiency because "[e]verything else follows from [it]: superior product design; superior manufacturing techniques; superior labor performance; superior estimates of consumer desires and market trends; superior distribution practices."). But see National Commission Report, supra note 8, at 158 (whether managerial and financial economies should be allowed as a defense is disputed). See generally F. Scherer, The Economics of Multiplant Operation: An International Comparison Study (1975) [hereinafter cited as F. Scherer II].
38. F. Scherer I, supra note 4, at 83; Haldi & Whitcomb, supra note 33, at 382.
39. Haldi & Whitcomb, supra note 33, at 381.
40. F. Scherer I, supra note 4, at 84.
41. F. Scherer I, supra note 4, at 84. Professor Scherer identifies the types of specialization resulting from operation of the multiplant firm as both managerial (accounting, finance, marketing, operations, research, and legal talent) and production. The production specialization, however, actually results from plant scale economies, that is, more specialization can be achieved within individual plants for a given product line. Id.
42. Id.; Baumol, The Transactions Demand for Cash: An Inventory Theoretic Approach, 66 Q.J. Econ. 545, 547-49 (1952); cf. Brunner & Meltzer, Economics of Scale in Cash Balances Reconsidered, 81 Q.J. Econ. 422, 423, 436 (1967) (cash balances economies of scale usually not present). Beneficial massed reserve economies include large cash balances, more flexible production, market and finance risk of loss spread over a large volume, and greater returns on marketing expenditures. F. Scherer I, supra note 4, at 84.
43. F. Scherer I, supra note 4, at 92-94; Saving, supra note 29, at 572. Saving identifies a fifth technique, the questionnaire method, in which business persons are asked "which size of plant or firm is the optimum size in their industry." Id. This method is open to criticism on grounds that the data may not be accurate at the time
ies are useful for measuring real economies because they estimate the cost of producing a commodity by breaking production into component operations and assessing the cost of each operation. These studies rely on cost accountants' data and employ standard statistical techniques to estimate the long run average total cost for a cross section of plant scales by comparing input statistics with output statistics. Methodologies used and conclusions drawn from statistical cost studies, however, have been criticized because the cost data are often unavailable, untimely, not comparable, and too simplistic.

44. J. Dean, Managerial Economics 298-313 (1951); J. Johnston, supra note 37, at 1; F. Scherer I, supra note 4, at 93; A. Walters, An Introduction to Econometrics 269-339 (1970); McGee, supra note 31, in Industrial Concentration, supra note 12, at 65-68; Scherer, Economies of Scale and Industrial Concentration [hereinafter cited as Scherer II], in Industrial Concentration, supra note 12, at 16; Smith, supra note 29, at 213-38; Walters, Production and Cost Analysis, 12 Int'l Encyclopedia Soc. Sciences 519, 521-23 (1968) [hereinafter cited as Walters I]; Walters, Production and Cost Functions: An Econometric Survey, 31 Econometrica 39, 52 (1963) [hereinafter cited as Walters II]. An ideal statistical cost study would evaluate short-run and long-run cost-output relationships. J. Johnston, supra note 37, at 27. These ideals, however, are rarely met. Id. at 26-29.

45. F. Scherer I, supra note 4, at 93. These studies usually estimate cost scale relationships at the plant level. Id.

46. Id.; Scherer II, supra note 44, in Industrial Concentration, supra note 12, at 18.

47. J. Blair, Economic Concentration 176 (1972) (unit cost data is fragmentary and out of date); J. Johnston, supra note 37, at 2, 28-30, 169-94 (listing six criticisms that relate to the short run average total cost function and three that relate to the long run average total cost function); F. Scherer I, supra note 4, at 93 (true cost variations associated with scale differences may be misstated if there are systematic differences in rent imputation between small plants and large). Stigler, supra note 12, at 55 (because cost data are influenced by productive services valuations, an over or under valuation will under or overstate efficiency); Friedman, Comment, in Business Concentration, supra note 29, at 230-31 (1955) (accounting cost studies only measure "the efficiency of the capital market in revaluing assets."); McGee, supra note 31, in Industrial Concentration, supra note 12, at 66 (Because they rely on accounting data used in routine business transactions, accounting cost studies are not very useful, and "suffer from arbitrary asset valuations and a host of other technical difficulties. Furthermore, quite different production programs (so far as different total volumes, product types, etc.) are often being compared."); Saving, supra note 29, at 572; Scherer II, supra note 44, in Industrial Concentration, supra note 12, at 18 (Data often are unavailable and when available not comparable because of differences in accounting conventions.); Smith, supra note 29, in Business Concentration, supra note 29, at 216, 221 (comparisons of cost data are highly suspect because cost allocations vary according to the cost accounting techniques used by the firm); Walters II, supra note 44, at 42-43 (1963) (accounting cost data are suspect because the unit period for accounting purposes usually differs from the unit economic period, the method of depreciation of assets is usually determined by the tax authorities, not
As to particular markets, therefore, the validity of statistical tests and techniques is doubtful.\textsuperscript{48}

Real scale economies also can be measured with engineering cost estimates, which utilize engineering techniques to measure the efficiency of various technical processes.\textsuperscript{49} Engineering cost estimates have the advantages of avoiding arbitrary asset valuations by accountants and evaluating each relevant dimension of production.\textsuperscript{50} Disadvantages, however, include failure to account for managerial and entrepreneurial ability\textsuperscript{51} and unrealistic economic assumptions.\textsuperscript{52} Moreover, the estimates are often not easily translatable into terms useful to economists.\textsuperscript{53}

Profitability studies are generally used to estimate scale economies for the firm as a whole.\textsuperscript{54} These estimates do not distinguish between real and strictly pecuniary economies because profitability figures are not designed to provide such detailed information. Although profitability data is usually available,\textsuperscript{55} profits may result from a variety of causes other than efficiency.\textsuperscript{56} Moreover, profit figures may not ade-

\textsuperscript{48} J. Johnston, \textit{supra} note 37, at 2; McGee, \textit{supra} note 31, in Industrial Concentration, \textit{supra} note 12, at 67.

\textsuperscript{49} J. Bain, \textit{supra} note 15, at 71-83, 227-49; B. Boylan, \textit{Economic Effects of Scale Increases in the Steel Industry} (1975); F. Scherer I, \textit{supra} note 4, at 94; F. Scherer II, \textit{supra} note 37, at 182-83; Bain, \textit{Economies of Scale, Concentration, and the Conditions of Entry in Twenty Manufacturing Industries}, 44 Am. Econ. Rev. 35 (1954); Chenery, \textit{Engineering Production Functions}, 63 Q.J. Econ. 507, 508-10 (1949); Smith, \textit{supra} note 29, in \textit{Business Concentration}, \textit{supra} note 29, at 221; Weiss I, \textit{supra} note 13, at 132-33. Management decisions regarding the desirability of alternate equipment and plant design are often based upon such studies. \textit{See} sources cited \textit{supra}.

\textsuperscript{50} McGee, \textit{supra} note 31, in \textit{Industrial Concentration}, \textit{supra} note 12, at 69.

\textsuperscript{51} \textit{Id.} Engineering studies include assumptions as to ideal or average managerial ability. \textit{Id.} Other areas not covered by engineering studies include recruitment, evaluation, promotion, product design, research, planning, administration, cost and quality control, finance, and marketing. \textit{Id.}

\textsuperscript{52} \textit{See} Saving, \textit{supra} note 29, at 572. Engineering cost studies assume that supply and demand for the product are also completely elastic. \textit{Id.}

\textsuperscript{53} Walters II, \textit{supra} note 44, at 572. The results of engineering studies separate processes that may be inseparable. \textit{Id.}

\textsuperscript{54} F. Scherer I, \textit{supra} note 4, at 92.

\textsuperscript{55} \textit{Id.}

\textsuperscript{56} J. Blair, \textit{supra} note 47, at 177 (profits may also reflect monopoly power, not solely efficiency); F. Scherer I, \textit{supra} note 4, at 92 (same); McGee, \textit{supra} note 31, in \textit{Industrial Concentration}, \textit{supra} note 12, at 83-88 (accounting profits not necessarily economic profits). Even if profits measure efficiency, profit rates for small firms are usually understated because profits are not broken down as to each product, and older equipment is undervalued. J. Blair, \textit{supra} note 47, at 177-78.
quately reflect true profits because of various accounting conventions governing depreciation and asset valuation.57

Equally ambiguous results are achieved with the survivorship technique, which infers optimal scale from observations of which size firm survives.58 Firms are classified according to size, and if the market share of a given size-class increases, that size is assumed to be relatively more efficient.59 As with profitability studies, no distinction is made between real and strictly pecuniary scale economies. Many economists, however, doubt the reliability of the survivorship technique because survival may result from causes other than greater efficiency, such as exercise of monopoly power, collusion, or undesirable labor practices.60

57. McGee, supra note 31, in Industrial Concentration, supra note 12, at 84 (corporate profits fail to account for efficiency benefits accruing to the consumer). The statistical cost study method shares these faults. See note 47 supra and accompanying text.

58. Saving, supra note 29, at 572-73 (1961). The survivorship technique was initially used in 1924 by Willard L. Thorp in a census monograph to demonstrate a "trend in the size of plant under different patterns of industry growth." Id. at 573; see Stigler, supra note 12, at 54-55, 61-67.

59. Saving, supra note 29, at 574-83; Stigler, supra note 12, at 56; Weiss, The Survival Technique and the Extent of Suboptimal Capacity, 72 J. Pol. Econ. 246, 246 (1964) [hereinafter cited as Weiss II]. The survivorship technique estimates optimal plant size by comparing successive discrete size distributions, Markov Chains, and continuous size distributions. Saving, supra note 29, at 574 & n.9.

60. See generally F. Scherer I, supra note 4, 92-93 (The reliability of the survivorship technique depends on how reasonable it is to suppose that the optimum scale or distribution has itself remained unchanged and the emergence of new mistakes has been less important than the correction of old ones. These assumptions should not be taken for granted.); Saving, supra note 29, at 597 (When monopolistic industries are treated on an equal basis with competitive industries, the estimated optimum size may become a size that has considerably higher social costs than some nonoptimal size.); Stigler, supra note 12, at 62-63 (size and other factors are variable not static); Weiss II, supra note 59, at 246. "Large firms may survive and grow by means of predatory or restrictive policies or because of their ability to exploit suppliers. They may decline, relatively, because their market positions force them to hold an umbrella over the firms in the competitive fringe of the industry or because they feel a threat of dismemberment at the hands of the antitrust authorities. Small firms may survive and grow because of their ability to exploit monopsonistic positions in local labor markets or to circumvent the law. The survival technique makes no distinction between these advantages and those attributable to low social costs." Id. at 246. Professor Weiss gives the additional example that suboptimal smaller firms could survive in an oligopolistic market in which price is set above minimum average cost. The smaller firms would have an incentive to replace plants with suboptimal capacity with plants of optimal scale, but this would not be essential to their survival. Id. at 253. But see Weiss II, supra note 59, at 260 (Investigation of five industries using tabulations of all plant sizes reported in directories led to the conclusion that the estimates of minimum efficient scale derived from the survivorship technique were consistent with engineering estimates. In view of the limited nature of this study, however, it did not prove the validity of the survivorship technique.).
The characteristics of these techniques lead to various conclusions about their adaptability to antitrust analysis. Statistical cost studies and engineering studies should be preferred for antitrust purposes because they are more precise, likely to be available because they are made in the regular course of business, and more appropriate for measuring real scale economies. Profitability studies and survivorship studies are less precise and, therefore, may be less appropriate for use in antitrust litigation.

II. CURRENT LEGAL STANDARDS

Adapting economic theory to a legal context is problematic for several reasons. Economists do not universally agree on economic theory regarding efficiencies. Measurement techniques, developed for purposes of empirical research, process complex economic data and may not be of practical use as legal evidence. Nevertheless, economic theory concerning scale economies can and should be applied to several antitrust issues. First, plaintiff can prove that scale economies constitute a barrier to entry by a showing of the magnitude of minimum optimal scale and the percentage of the market required to achieve that scale. Second, the effect that scale economies have on market structure can be used to infer the intent behind certain commercial conduct. For example, a capacity expansion that forecloses a competitor from growth or entry is not predatory if consistent with scale economies. Third, the effect that scale economies have on market structure can be considered along with other structural factors to determine the competitive effect that a contemplated action has on a market. For example, scale economy concepts can be used to justify a merger when the scale economies that result from the merger outweigh any anticompetitive structural effects. Further, the defendant can prove that divestiture is an inappropriate remedy when it would force operation at less than minimum optimal scale.

Courts, however, do not always use analysis of scale economies when it is appropriate. Scale economy issues are often not recognized. Even when recognized, the economic concepts often

61. See notes 44-53 supra and accompanying text.
62. See notes 54-60 supra and accompanying text.
63. See note 29 supra and accompanying text.
64. Id.
65. See notes 26-28 supra and accompanying text.
66. See note 25 supra and accompanying text.
67. Id.
68. Id.
69. See, e.g., Ford Motor Co. v. United States, 405 U.S. 562, 568 (1972) (scale economies not addressed in analyzing erection of barriers to entry resulting from
cause confusion when courts attempt to apply them to specific fact patterns. Finally, even after courts have correctly identified and analyzed such issues, they have failed clearly to delineate standards of proof. As a result of this confusion, reconciliation of the cases with economic principles is difficult. Nevertheless, adapting scale economy concepts to a legal framework is worthwhile and legally justified.

A. Natural Monopoly Cases

The importance of scale economy concepts is most obvious in markets in which the minimum optimal scale is equal to or greater than demand. Economists and judges refer to these markets as natural monopolies. That possession of natural monopoly power should not

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70. See, e.g., FTC v. Procter & Gamble Co., 386 U.S. 568, 579-580 (1967) (advertising economies resulting from merger identified but held that economies are no defense); Brown Shoe Co. v. United States, 370 U.S. 294, 343-44 (1962) (efficiencies of integration resulting from merger are no defense under § 7 and are an affirmative reason for holding the merger unlawful); Berkey Photo, Inc. v. Eastman Kodak Co., 603 F.2d 263, 276 (2d Cir. 1979) (integration efficiency argument accepted in defense of leveraging act when the two were unrelated), cert. denied, 444 U.S. 1093 (1980). But see FTC v. Procter & Gamble Co., 386 U.S. 568, 603 (1967) (Harlan, J., concurring) (analysis of economies is crucial to deciding case). Professor Bork has noted that "[m]odern antitrust [law's] . . . version of economics is a mélange of valid insights and obviously incorrect—sometimes fantastic—assumptions about the motivations and effects of business behavior . . . . Perhaps the core of the difficulty is that the courts . . . have failed to understand and give proper weight to the crucial concept of business efficiency . . . . [T]his failure has skewed legal doctrine disastrously." R. Bork, supra note 2, at 7. See generally Turner, supra note 5, at 1328-30.


give rise to liability under section 2 was first suggested in United States v. Aluminum Co. of America. Judge Hand in Alcoa argued that possession of monopoly power without intent to end or prevent competition gave rise to a "thrust upon" defense. One example of this defense given by Judge Hand was when the market is "so limited that it is impossible to produce at all and meet the cost of production except by a plant large enough to supply the whole demand." Although ambiguous, this language has been used by courts to hold that the "thrust upon" defense does indeed cover a natural monopoly situation.

Courts have only superficially discussed proof of the existence of natural monopoly power. Instead of relying on economic studies to prove that the minimum efficient scale will supply all the demand, courts readily accept the existence of natural monopolies in certain industries such as daily newspapers in small towns, professional new firm entering the business"); E. Mansfield, supra note 1, at 267 ("a firm may become a monopolist because the average cost of producing the product reaches a minimum at an output rate that is big enough to satisfy the entire market at a price that is profitable"); F. Scherer I, supra note 4, at 91, 482 (A natural monopoly market, one in which there is room for only one firm, results from the relevant technology and the size of the market, that is, the level of demand at which price equals minimum unit cost.). The extent to which a natural monopoly market sets parameters for antitrust enforcement depends upon the shape of the long run average total cost curve. See note 24 supra and accompanying text (economists disagree on the shape of the long run average total cost curve).

73. 148 F.2d 416, 429-30 (2d Cir. 1945).
74. Id.
75. Id. at 430.
77. For a discussion of the relevant measures of efficient scale, see notes 43-60 supra and accompanying text.
sports teams, utilities, and some contractual relationships with the government. Although never expressly analyzing cost factors that would evidence a natural monopoly, courts infer a natural monopoly when evidence has proven the existence of exclusive dealing arrangements, such as restrictive covenants, exclusive franchises, exclusive contracts, or essential facilities. Such a conclusion is unwarranted without further examination of the underlying economic evidence. These cases are useful, however, for analyzing the bounds of acceptable behavior for a natural monopolist.

Once a market is termed a natural monopoly, lawful acquisition of monopoly power is virtually assumed. Aggressive competition is

Harte-Hanks Newspapers Inc., 170 F. Supp. at 228. One court mentioned production scale economies as a factor relevant to the existence of a natural monopoly, but did not analyze such economies. Id.


81. Ovitron Corp. v. General Motors Corp., 295 F. Supp. 373, 376 (S.D.N.Y. 1969). In Ovitron, the government was the sole buyer of the product at issue. The low bidder for the production contract supplied the whole demand. The court mentioned that too low for a large quantity of the product in satisfaction of the contract takes as much as one year. Unfortunately, there was no further analysis of production scale economies. Id. at 377 n.2.


85. Hecht v. Pro-Football, Inc., 570 F.2d 982, 992-93 (D.C. Cir. 1977), cert. denied, 436 U.S. 956 (1978). In Hecht, the court applied the “essential facility” doctrine or “bottleneck principle,” finding that a restrictive covenant in the defendant’s lease of the stadium, the only stadium in the relevant geographic market suitable for the exhibition of professional football games, mandated finding a natural monopoly. See id.

86. See Otter Tail Power Co. v. United States, 410 U.S. 366, 369, 377 (1973); Hecht v. Pro-Football, Inc., 570 F.2d 982, 990, 991 (D.C. Cir. 1977), cert. denied,
tolerated; the winner in a fight for survival is not condemned for having won. 87 Acquisition of a natural monopoly market, however, is lawful only if specific exclusionary practices, such as predatory pricing, 88 group boycotting, 89 below cost bidding, 90 and price squeezing, 91 were not used. Such practices might defeat the presumption of legality and give rise to liability.

Maintaining a natural monopoly also is presumed legal. The natural monopolist may defend against potential competitors 92 and use the benefits of the natural monopoly to enter new markets through vertical integration or horizontal expansion, 93 even when extending into other natural monopoly markets. 94 As with acquisition, however, maintenance of a natural monopoly cannot be accomplished by means such as leveraging, 85 price squeezing, 96 and bottlenecking. 97


87. United States v. Aluminum Co. of Am., 148 F.2d 416, 430 (2d Cir. 1948).
94. Union Leader Corp. v. Newspapers of New Eng., Inc., 284 F.2d 582, 584 (1st Cir. 1960).
Scale economies inherent in a natural monopoly also receive deference when a court is determining appropriate relief after a natural monopolist has violated the antitrust laws.\textsuperscript{98} Divestiture is generally not appropriate.\textsuperscript{99} Illegal predatory practices are remedied by injunction or regulation,\textsuperscript{100} presumably because it is in the public interest to preserve the scale economies achieved by the natural monopolist.\textsuperscript{101}

\section*{B. Extension of the Natural Monopoly Cases}

When scale economies play the central role in a market, as in the natural monopoly cases, courts have limited antitrust scrutiny and preserved the efficiency inherent in large scale economies. The logic of this deference can and should be extended to markets in which scale economies play an important, though less central, role\textsuperscript{102} because economies of scale generally exist for any production process and to that extent will control the structure of a market.\textsuperscript{103} Serious practical problems, however, may arise in gauging the extent to which scale economies control a market\textsuperscript{104} when scale economies are significant, but do not give rise to a natural monopoly. Strong and convincing evidence of the existence of scale economies is not likely to be present.\textsuperscript{105} Courts would be forced to measure scale economies

\begin{footnotesize}
\begin{enumerate}
\item 98. Cf. notes 129-36 infra and accompanying text (deference to scale economies when determining relief under § 2).
\item 99. United States v. Aluminum Co. of Am., 148 F.2d 416, 446 (2d Cir. 1945) ("Dissolution is not a penalty but a remedy; if the industry will not need it for its protection, it will be a disservice to break up an aggregation which has for so long demonstrated its efficiency."). Divestiture of a natural monopoly would, by definition, destroy scale economies. \textit{See} note 73 supra and accompanying text.
\item 100. \textit{E. Mansfield, supra} note 1, at 267, 292-94 (the public often insists on government regulation when a merger creates a natural monopoly); \textit{F. Scherer I, supra} note 4, at 482 ("[t]he most traditional economic case for regulation assumes the existence of natural monopoly"). Scherer lists three hypotheses explaining why regulation is necessary in the natural monopoly situation: to protect consumers from the inherent monopoly power, to promote political objectives, or to protect vested interests. \textit{Id.} at 483. This Note does not address regulated industries because they are largely outside the scope of the antitrust laws, and because the legal and economic interrelations between regulation and competition are complex. \textit{C. Kaysen & D. Turner, supra} note 3, at 4.
\item 101. \textit{See} note 72 supra and accompanying text.
\item 102. Courts should respect the economic theory underlying the antitrust laws when deciding any antitrust case, \textit{see} note 9 supra and accompanying text, as courts have when dealing with natural monopoly markets. \textit{See} notes 72-100 supra and accompanying text.
\item 103. 2 P. Areeda & D. Turner, \textit{supra} note 1, ¶ 408; \textit{F. Scherer I, supra} note 4, at 81.
\item 104. For a discussion of problems with economists' techniques for measuring scale economies, \textit{see} notes 27-48 supra and accompanying text.
\item 105. Courts faced with natural monopoly cases have circumvented proof problems by using strong and concrete circumstantial evidence. Courts have concluded that
\end{enumerate}
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under section 2 by relying on difficult to obtain direct economic evidence\textsuperscript{106} such as engineering studies\textsuperscript{107} and opinion testimony of industry executives.\textsuperscript{108} Nevertheless, because of the clear economic effect of scale economies, courts should strive to overcome these practical problems by more systematically measuring scale economies and incorporating them in analysis of liability and relief.\textsuperscript{109}

1. Section 2

Once proven, scale economies are relevant to three market structure\textsuperscript{110} and conduct\textsuperscript{111} issues under section 2. First, when scale

a natural monopoly market exists without determining minimum efficient scale. See notes 77-85 \textit{supra} and accompanying text. Circumstantial evidence of lesser scale economies, if available at all, is not likely to be clear and convincing.

106. See notes 48, 55, 58-59, 62 \textit{supra} and accompanying text.


109. Fisher Deposition Exhibit 8101-001, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y., filed Jan. 17, 1969) (analytical narrative of Franklin Fisher), Dec. 4, 1980, at 372-85 (scale economies cannot be determined with only vague statements of industry witnesses about the magnitude of minimum efficient scale); Mancke Deposition Exhibit 8100-017 (analytical narrative of Richard Mancke), Nov. 20, 1980, at 770, \textit{id}. (testimony of industry witnesses relied on by government experts does not support their estimates of minimum efficient scale). These practical problems can be substantially overcome by using various measurement techniques to determine minimum efficient scale. See notes 29-62 \textit{supra} and accompanying text.


111. The conduct component of the actual monopolization offense under § 2 is the wilful acquisition or maintenance of market power, or the use of such power to foreclose competition or gain a competitive advantage. United States v. Grinnell Corp.,
economies constitute a barrier to entry, they may supplement traditional market share analysis to show that market power exists. One discussion of scale economies constituting an entry barrier is in United States v. International Business Machines Corp. The government's economic witnesses have testified that IBM's market power is protected by a scale economy barrier that requires an entrant to achieve a 5% to 15% market share before it can operate at minimum efficient scale. According to government testimony, the entry bar-


112. See notes 26-28 supra and accompanying text. The natural monopoly situation is the extreme example of scale economies as a barrier to entry. Any potential entrant recognizing that the market can support only one firm would be deterred from entering. Fisher Deposition Exhibit 8101-001, Dec. 4, 1980, at 364-70, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y., filed Jan. 17, 1969) (analytical narrative of Franklin Fisher).


114. Record at 69719-24, United States v. IBM Corp., No. 69 Civ. 200 (S.D.N.Y., filed Jan. 17, 1969) (direct testimony of Leonard Weiss, March 16, 1978). Weiss relied on an estimate of minimum efficient scale for "Electric Capital Goods" made by C.F. Pratten, and testimony of witnesses from Univac, Xerox, General Electric, Record at 7095-86, id. (testimony of Ulric Weil); Plaintiff's Exhibit 320, at 26, id. (General Electric estimated that 10 to 15 percent of the general purpose market was required to have some stability in its product offering and its ability to serve customers), and RCA. Record at 13081-82, id., (testimony of Vernon Wright) (RCA determined a 10% share of the general purpose market was necessary to provide and sustain a broad development program). No industry executives based their estimates
rier resulting from minimum efficient scale of this size is very high, substantially delaying entry and enhancing IBM's market power.\textsuperscript{113} IBM argues that scale economies are not a barrier to entry because firms have entered and operated successfully at less than 5\% to 15\% of the market.\textsuperscript{116} The government's legal argument that significant scale economies constitute a barrier to entry that evidences market power is consistent with at least some well accepted economic theory.\textsuperscript{117}

The legality of acquiring and maintaining market power also can be analyzed using scale economy concepts. Although stronger evidence may be required to prove the specific intent element of attempted monopolization than the general intent element of actual monopolization,\textsuperscript{118} a defense based on scale economies is similar for either offense.\textsuperscript{119} For example, scale economies can justify capacity expansions that exclude competition from profitable growth opportunities.\textsuperscript{120} Although \textit{United States v. Aluminum Co. of

upon studies of the shape of the firm's long run average total cost curve. Weiss concluded, very tentatively, that this information indicated that a 5\% to 15\% share of the market would be needed to be efficient in the relevant market. Record at 69725, \textit{id.} (direct testimony of Leonard Weiss, March 16, 1978); Record at 53560-61, \textit{id.} (direct testimony of Alan McAdams). McAdams testified that among the major barriers to entry to the relevant market was the scale of operations required to achieve efficiency, which he estimated to be at least 10\% of the market. Record at 53560-61, \textit{id.}

\textsuperscript{115} Record at 69728, \textit{United States v. IBM Corp.}, No. 69 Civ. 200 (S.D.N.Y., filed Jan. 17, 1969) (direct testimony of Leonard Weiss, March 16, 1978). This minimum efficient scale for the relevant market was comparable to Bain's estimates of minimum efficient scale for five industries thought to have high scale economies barriers. \textit{Id.}


\textsuperscript{120} A preemptive capacity expansion is an effective anticipation of increases in demand and forestallment of all competition. This can be accomplished by progressively embracing each new opportunity as it opens and facing each newcomer with new capacity, \textit{United States v. Aluminum Co. of Am.}, 148 F.2d 416, 430-31 (2d Cir. 1945), or by building excess capacity or planning to fulfill foreseen demand with new and expanded plants of greater size than needed for minimum optimal scale. \textit{See} \textit{E.I. DuPont de Nemours & Co.}, [1980] Antitrust & Trade Reg. Rep. (BNA), No. 987,
America\textsuperscript{121} held that a monopolist's maintenance of market share through repeated capacity expansions, though reasonably responsive to anticipated demand, was exclusionary conduct that constituted an abuse of monopoly power,\textsuperscript{122} the court did not consider whether Alcoa's expansions were consistent with scale economies. No subsequent case has addressed a scale economies defense to a charge that a capacity expansion was preemptory within the context of actual monopolization. Scale economies have, however, been accepted as a defense to the specific intent element of the attempted monopolization offense. The Federal Trade Commission (FTC) recently upheld an expansion strategy that was wholly responsive to projected demand increases \textit{and} consistent with plant scale economies against an allegation that the expansion was primarily intended to preempt competitors' expansion plans.\textsuperscript{123} The FTC held that the defendant should be permitted to expand capacity in increments of at least minimum efficient scale, even if the result was to preempt competition.\textsuperscript{124}

Scale economies also have been used to justify allegedly predatory behavior, other than preemptive capacity expansions, in actual monopolization cases. For example, a dealer reduction program is not predatory if justified by scale economies in which the manufacturer's unit cost of marketing his product is less when fewer dealers are trained.\textsuperscript{125} Moreover, manufacturers can collectively switch distribut-
tors with impunity if motivated solely by a desire to maintain economies of scale. The existence of scale economies, however, does not constitute a complete defense to other predatory practices. For example, monopoly power resulting from scale economies, whether pecuniary or real, cannot be leveraged from one market into another.

Finally, scale economy concepts can be used to determine appropriate relief under section 2. The remedial goal of eliminating illegal market power must be balanced against any public injury resulting from a loss in economies. Thus, divestiture is proper only as the court deems necessary to meet the remedial goals of the statute. When this is found to be necessary, divestiture is appropriate relief.


128. Fortner Enterprises, Inc. v. United States Steel Corp., 394 U.S. 495, 509 (1969) (scale economies achieved in one market cannot be used to exert economic power over other products that company produces). Compare United States v. Griffith, 334 U.S. 100, 108 (1948) (Although large scale buying is not per se unlawful because it may yield price or other lawful advantages to the buyer, monopoly power gained through large scale buying may not be leveraged into another market) with FTC v. Procter & Gamble Co., 356 U.S. 568, 603-04 (1957) (Harlan, J., concurring) (strictly pecuniary economies may not support a defense). But see Berkey Photo, Inc. v. Eastman Kodak Co., 603 F.2d 263, 276 (2d Cir. 1979) (integrated business does not offend Sherman Act whenever one of its departments benefits from association with a division possessing a monopoly in its own market), cert. denied, 444 U.S. 1093 (1980).


130. Scherer, *Structure-Performance Relationships and Antitrust Policy* [hereinafter cited as Scherer III], in Industrial Concentration and the Market System 128 (E. Fox & J. Halverson eds. 1979) [hereinafter cited as Concentration and the Market]; Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoffs*, 58 Am. Econ. Rev. 18, 18 (1968) [hereinafter cited as Williamson II]. This balancing is a tradeoff between social welfare benefits resulting from achieving scale economies and social welfare losses resulting from allocative inefficiencies caused by increased market power. Id. at 18-19, 23, 32. Through a partial equilibrium analysis, Williamson concludes that a merger that yields non-trivial real economies must produce substantial market power and result in relatively large price increases for the net allocative effects to be negative. Id. at 23. Similarly, a divestiture that destroys non-trivial real economies must divest substantial market power and result in relatively large price reductions for the net allocative effects to be positive. Id.; see Fox, *Economic Concentration, Efficiencies and Competition: Social Goals and Political Choices*, in Concentration and the Market, supra, at 137. The more market power a firm has, the less likely it is to maximize potential scale economies or lower price. Id. at 141. A court considering relief also will usually consider whether relief is necessary to re-
when scale economies are not seriously impaired.131 Although standards used by courts to determine the appropriateness of divestiture as a remedy in a section 2 case are not clear,132 courts have been reluctant to grant divestiture,133 probably because they are unable to determine clearly its likely net effects.134 Economists also are apparently unable to determine clearly the effects of divestiture. Although recent economic studies have indicated that scale economies mandate high degrees of concentration,135 other studies show that many industries store competition in the monopolized market and whether a less restrictive alternative to divestiture, such as an injunction, is appropriate. See United States v. United Shoe Mach. Corp., 391 U.S. 244, 250-52 (1968); United States v. Aluminum Co. of Am., 91 F. Supp. 333, 344 (S.D.N.Y. 1950); L. Sullivan, supra note 9, § 54, at 142-43; Elzinga, The Goals of Antitrust: Other Than Competition and Efficiency, What Else Counts?, 125 U. Pa. L. Rev. 1191, 1196, 1199 (1977).

131. See note 99 supra and accompanying text.


133. See note 99 supra and accompanying text.

134. United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 347-48 (D. Mass. 1953) (reluctance to order dissolution is caused in part by lack of expertise in economic theories upon which structural relief is based), aff'd per curiam, 347 U.S. 521 (1954); see L. Sullivan, supra note 9, §§ 53, 55, at 141, 145; Williamson II, supra note 130, at 19. In United Shoe, Judge Wyzanski was unwilling to grant divestiture when it appeared impossible to create three independent, integrated firms. In particular, the operation had one plant, one set of jigs and tools, one foundry, and one laboratory. 110 F. Supp. at 348. Commentators have criticized United Shoe for its failure to recognize the flexibility of American business to respond to changed conditions. See Baldwin, The Feedback Effect of Business Conduct on Industry Structure, 12 J.L. & Econ. 123, 128 (1969); Dewey, Romance and Realism in Antitrust, 63 J. Pol. Econ. 93, 93-101 (1955). Because courts lack a basis for evaluating net effects of a merger, they often are predisposed to disallow it. See Williamson II, supra note 130, at 19. This predisposition flows from a reluctance to sacrifice long-term competitive consequences to short-term efficiency gains. Id. Courts, however, are not predisposed toward granting structural relief in § 2 cases. When the net effects are in doubt, it seems that courts are more willing to maintain the status quo than order divestiture after measuring the tradeoff between long-term anticompetitive consequences and short-term efficiency gains. Courts arguably do not possess the expertise to conduct this type of tradeoff analysis, but it can and should be performed by the Antitrust Division of the Justice Department or the FTC. Id. at 34; see United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 347-48 (D. Mass. 1953), aff'd per curiam, 347 U.S. 521 (1954).

could be considerably fragmented without seriously sacrificing scale economies. Thus, divestiture should be granted only when solid economic evidence showing that scale economies would not be destroyed has been introduced.

2. Section 7

Scale economies are relevant within the context of section 7 to assess the probable competitive effects of a merger. Liability under section 7, which is intended to arrest the undue concentration of economic power in its incipiency, arises when the merger may substantially lessen competition or tend to create a monopoly. Factors used by courts to determine the probable anticompetitive effects of a merger include concentration in the industry and the possibility of increased barriers to entry. Generally, courts will consider all economic and statistical data relevant to a determination of the probable impact of the merger, including resulting scale economies that create a barrier to entry or that have a procompetitive effect.

Although, as an economic matter, monopolies and mergers give rise to the same scale economy issues, the framework of section 7

136. F. Scherer II, supra note 37, at 393-96; Scherer III, supra note 130, at 133. 137. For the text of § 7, see note 11 supra. 138. Turner, supra note 5. In this seminal article on conglomerate mergers, Professor Turner notes that varying degrees of pro and anticompetitive consequences result from the various types of mergers, id. at 1317-22, and argues that if anticompetitive effects predominate, the merger should be discouraged. Id. at 1330. When beneficial effects such as the promotion of scale economies predominate, however, and such effects are unlikely to be realized in the absence of the merger, the merger should be encouraged. Id. at 1318. When the potential anticompetitive effects of a merger are great, but substantial scale economies are also likely to result, the possibility of achieving economies through internal growth should be considered. Id. at 1320-21. 139. Clayton Act § 7, 15 U.S.C. § 18 (1976) ("may be substantially to lessen competition, or tend to create a monopoly" (emphasis added)). 140. FTC v. Procter & Gamble Co., 386 U.S. 568, 578 (1967); United States v. Von's Grocery Co., 384 U.S. 270, 276-77 (1966); United States v. Philadelphia Nat'l Bank, 374 U.S. 321, 362-67 (1963); Brown Shoe Co. v. United States, 370 U.S. 294, 334-46 (1962). 141. FTC v. Procter & Gamble Co., 386 U.S. 568, 579 (1967); Emhart Corp. v. USM Corp., 527 F.2d 177, 180-82 (1st Cir. 1975). 142. See FTC v. Procter & Gamble Co., 386 U.S. 568, 603 (1967) (Harlan, J., concurring) (economies, including advertising economies, may be used to defend a merger); Brown Shoe Co. v. United States, 370 U.S. 294, 334 (1962) (merger that would foreclose substantial share of market "without producing any countervailing competitive, economic, or social advantages" violates § 7). But see FTC v. Procter & Gamble Co., 386 U.S. 568, 580 (1967) (majority opinion) (possible economies cannot be used as a defense to illegality); United States v. Philadelphia Nat'l Bank, 374 U.S. 321, 371 (1963) (an otherwise violative merger is not saved by evidence that it is beneficial "on some ultimate reckoning of social or economic debits and credits"). 143. Compare Brown Shoe Co. v. United States, 370 U.S. 294, 312-23 (1962) and 95 Cong. Rec. 11484-507 (1949) (House debates on H.R. 2734, a bill to amend the
creates more formidable analytical problems. First, section 7 mandates scrutiny of probable, not actual, economic effects. Moreover, section 7 case law defines three general categories of mergers, horizontal, vertical, and conglomerate, from which the kinds of scale economies likely to result are quite different. The result is that section 7 law on scale economies is confused and ambiguous.

Nevertheless evidence of scale economies can and should be used in several ways in the context of a section 7 case. First, scale economies can be used to assess the competitive environment in which a merger occurs. In Brown Shoe Co. v. United States, the Supreme Court held that analysis of the "structure, history, and probable future" of the market would provide the setting to judge the likely anticompetitive effects of the merger. In a market in which scale economy barriers exist, that is, when minimum efficient scale constitutes a significant share of the market, firms will compete less strenuously among themselves. Because potential entrants usually com-

Clayton Act) with United States v. Aluminum Co. of Am., 148 F.2d 416, 427-29 (2d Cir. 1945).

144. United States v. Aluminum Co. of Am., 91 F. Supp. 333, 345 (S.D.N.Y.) ("It is not unreasonable to suggest that a court may act more readily to keep apart what has never been joined together, than to dismember an existing entity which, in general, has well served the public."). aff'd, 192 F.2d 602 (2d Cir. 1950). Thus, courts seem more likely to resolve ambiguities in favor of the defendant in § 2 cases and in favor of the government in § 7 cases.

145. Turner, supra note 5, at 1318. For the language of § 7, see note 11 supra.

146. Horizontal mergers are defined as "economic arrangement[s] between companies performing similar functions in the production or sale of comparable goods or services," Brown Shoe Co. v. United States, 370 U.S. 294, 334 (1962), or as mergers between direct competitors. Merger Guidelines of the Department of Justice, [1977] Trade Reg. Rep. (CCH) ¶ 4510, at 6983.

147. Vertical mergers have been defined as "economic arrangements between companies standing in a supplier-customer relationship," Brown Shoe Co. v. United States, 370 U.S. 294, 323 (1962), or as acquisition "backward" into a supplying market or "forward" into a purchasing market. Merger Guidelines of the Department of Justice, [1977] Trade Reg. Rep. (CCH) ¶ 4510, at 6985.

148. Conglomerate mergers are defined as mergers that are neither horizontal nor vertical. This includes geographic or product extension mergers, that is, those involving two firms selling the same product in different geographic markets or similar products in the same market. Merger Guidelines of the Department of Justice, [1977] Trade Reg. Rep. (CCH) ¶ 4510, at 6987.

149. See Turner, supra note 5, at 1320-22; see notes 166-77 infra and accompanying text.


152. Id. at 322 n.38.

153. Kennecott Copper Corp. v. FTC, 467 F.2d 67, 77 n.8 (10th Cir. 1972), cert. denied, 416 U.S. 909 (1974). This is true for any firm with market power that oper-
prise a major competitive force in these markets, courts are likely to invalidate a merger that eliminates a potential entrant.

Evidence of scale economies may also be introduced as a defense in a section 7 case. Although the Supreme Court has held that economic evidence in defense of a merger should not be considered when the merger is horizontal or conglomerate, and usually should be considered when the merger is vertical, no express distinction is made on the basis of policy or congressional intent. Circuit and district courts have also taken inconsistent positions on the appropriateness of scale economies as a section 7 defense. The Ninth Circuit and one district court have rejected an operating efficiencies defense in horizontal cases. In contrast, the First Circuit, the

See Fruehauf Corp. v. FTC, 603 F.2d 345, 353 (2d Cir. 1979).

Id.; cf. Ford Motor Co. v. United States, 405 U.S. 562, 577-78 (1972) (court applied "potential entrant" theory and found liability, but did not discuss scale economies in relevant market).


FTC v. Procter & Gamble Co., 386 U.S. 568, 580 (1967) (Clorox). In Clorox, the majority held that possible economies cannot be used as a defense to illegality in the context of a conglomerate merger when the effect of the merger was to entrench the acquired firm in a dominant position. Justice Harlan's concurring opinion in Clorox, however, criticized the majority's analysis of economies. He argued that real economies are an appropriate defense under § 7. Moreover, he noted the difference between advertising economies and economies resulting from production, distribution, and marketing. Id. at 603 (Harlan, J., concurring). Economists call the savings in advertising strictly pecuniary economies, and the others real economies. See notes 17-19 supra and accompanying text.

Brown Shoe Co. v. United States, 370 U.S. 294 (1962). In analogizing the vertical aspects of the merger at issue, the Court stated that various economic and historical facts should be considered when the percentage of the market foreclosed is neither a monopoly nor de minimus. Id. at 328-29. The Court found that Congress intended that the economic purpose of a vertical merger be considered. Id. at 319.

The trend, however, apparently is to consider economic evidence. See notes 5-6, 9 supra and accompanying text.

RSR Corp. v. FTC, 602 F.2d 1317, 1325 (9th Cir. 1979), cert. denied, 445 U.S. 927 (1980); International Tel. & Tel. Corp. v. General Tel. & Elec. Corp., 518 F.2d 913, 936 (9th Cir. 1975); Crown Zellerbach Corp. v. FTC, 296 F.2d 800, 825-27 (9th Cir. 1961), cert. denied, 370 U.S. 937 (1962); United States v. Bethlehem Steel Corp., 168 F. Supp. 576, 618 (S.D.N.Y. 1958) [citing congressional intent to halt the growing tendency toward increased concentration of power in spite of possible efficiency and lower cost to the ultimate consumer that may result from the merger]. But see Crown Zellerbach Corp. v. FTC, 296 F.2d 800, 826 n.32 (9th Cir. 1961) (economies of scale specifically mentioned as a factor to consider).
ECONOMIES OF SCALE IN ANTITRUST LAW

D.C. Circuit, one district court, and the FTC have argued that evidence of scale economies resulting from a merger should be considered in defense of a merger under section 7.\footnote{Emhart Corp. v. USM Corp., 527 F.2d 177, 181-82 (1st Cir. 1975) (A § 2 case, analyzed using § 7 case law, held that entrenchment theory under § 7 makes strictly pecuniary economies resulting from a merger unlawful. It does not hold, however, that real economies resulting from a merger are unlawful.) Northern Natural Gas Co. v. Federal Power Commission, 399 F.2d 953, 967 n.28 (D.C. Cir. 1968) (merger doesn’t result in use of excess capacity or make possible other economies of scale; in fact, it is possible that scale economies were sacrificed in order to protect the market from an independent competitor); United States v. Wilson Sporting Goods Co., 288 F. Supp. 543, 566 n.38 (N.D. Ill. 1968) (in dicta, explicitly endorsed Justice Harlan’s concurring opinion in Clorox, which accepts a “real” scale economies defense as the more logical approach); Beatrice Foods Co., [1973-1976 Transfer Binder] Trade Reg. Rep. (CCH) 20,944, at 20,792 (F.T.C. 1975) (“improved efficiency and price reductions are certainly no reason to condemn a merger not otherwise shown to be anticompetitive”).}

Some courts have suggested the extreme and clearly erroneous position that a merger should be held unlawful \textit{because} it results in efficiencies. Specifically, they hold that a section 7 violation can be established by proof that the merged firm will be more efficient than its smaller competitors as a result of the merger.\footnote{Brown Shoe Co. v. United States, 370 U.S. 294, 344 (1962); Purex Corp. v. Procter & Gamble Co., 596 F.2d 881, 887-88 (9th Cir. 1979); United States v. Ingersoll-Rand Co., 218 F. Supp. 530, 554 (W.D. Pa.), aff’d, 320 F.2d 509 (3d Cir. 1963); Foremost Dairies Inc., 60 F.T.C. 944, 1084 (1962); see R. Bork, supra note 2, at 6-7 (Because business efficiency lowers costs, it necessarily benefits consumers. Therefore, when it is seen as a positive evil, the legality of business behavior that results in efficiency will not be upheld. This is the worst possible result.).}

This argument unreasonably extends the populist notion that antitrust law should protect small business, and fails to recognize that a reason for promoting competition is that competition forces firms to operate efficiently.\footnote{Turner, supra note 5, at 1324-25. “This position is not only bad economics but bad law . . . . [T]he supposed purpose to preserve small business has never been translated into rules banning conduct that was not arguably anticompetitive or harmful in some other respect.” \textit{Id}.}

A more logical approach, implicit in recent Court decisions, is that real economies are always procompetitive and should be weighed against anticompetitive effects in all merger cases.\footnote{Turner, supra note 5, at 1316-17; United States Dep’t of Justice, \textit{Antitrust Guide Concerning Research Joint Ventures}, [1980] Antitrust & Trade Reg. Rep. (BNA), No. 992, 3-4 (Spec. Supp. Dec. 4, 1980); see note 7 supra and accompanying text. The Justice Department explicitly endorses a balancing approach in analyzing the competitive effects of a research joint venture under § 7 of the Clayton Act or § 1 of the Sherman Act. [1980] Antitrust & Trade Reg. Rep. (BNA) at 3. One example that the Guide gives of a valid justification for a joint venture is when individual firms cannot independently and efficiently finance research projects, presumably because this will increase innovation. \textit{Id}. at 4. Moreover, joint research that replaces individual research by the participants is still justified if it results in substantial efficiencies. \textit{Id}.}
approach is mandated by the clear economic effect of scale economies, the feasibility of various measurement techniques, and the importance of efficiency as an antitrust goal,\(^\text{165}\) and is understood best within the context of the three types of mergers.

Horizontal mergers are most likely to yield real scale economies in production, research, distribution, cost of capital, management, skill, and knowhow, as well as to allow the firm flexibility to alter production levels so that each of its plants produces at minimum efficient scale.\(^\text{166}\) They are also most likely to result in anticompetitive effects.\(^\text{167}\) Moreover, even if strong antimerger standards were applied, the firm could probably achieve these economies by internal expansion.\(^\text{168}\) In cases in which the benefits of scale economies clearly outweigh anticompetitive effects, however, the merger nevertheless should be upheld.\(^\text{169}\)

Vertical mergers are less likely to yield real scale economies, but will often yield efficiencies of integration and firm scale economies.\(^\text{170}\) Because the anticompetitive effects of a vertical merger are more remote than those of a horizontal merger, and barriers to entry are likely to deter internal expansion, a strong policy against vertical mergers is more likely to prevent scale economies from being realized.\(^\text{171}\) As with horizontal mergers, however, the facts of a specific case may alter this general balance and lead to invalidating a vertical merger.\(^\text{172}\)

Conglomerate mergers generally result in few scale economies and few anticompetitive effects.\(^\text{173}\) Significant real economies from a pure conglomerate merger are unlikely because the products of the acquiring and the acquired firm generally are not interrelated.\(^\text{174}\) Conglomerate mergers are likely, however, to yield strictly pecuniary economies in management services, advertising costs, and capital costs.\(^\text{175}\) The savings in management and advertising are likely to be

\(^{165}\) See notes 6-7, 23, 29-62 supra and accompanying text.


\(^{167}\) Turner, *supra* note 5, at 1320.

\(^{168}\) *Id.*


\(^{170}\) F. Scherer I, *supra* note 4, at 78-79. Vertical mergers are likely to result in a more efficient arrangement of facilities from continuous production economies. Vertical mergers may, however, introduce complications for a firm when the minimum efficient scale for the two production processes is not the same.

\(^{171}\) Turner, *supra* note 5, at 1321.

\(^{172}\) *Id.* at 1330.

\(^{173}\) Blair, *supra* note 166, at 679-80; cf. Turner, *supra* note 5, at 1329 (Blair overstates this principle).

\(^{174}\) Turner, *supra* note 5, at 1329.

\(^{175}\) *Id.* at 1330.
greater when the products of the merging firms are similar. Although it is possible that anticompetitive effects will result from a conglomerate merger, it is not as likely as it is for either horizontal or vertical mergers. Thus, the required showing of beneficial economic effects arguably should be less for conglomerate mergers. As with all section 7 cases, courts should balance the merits of each case on an ad hoc basis.

Conclusion

A free market economy relies on market mechanisms to promote social welfare. When the market mechanisms fail, market power results. The purpose of antitrust law is to control exercises of such power. Antitrust law, however, must be able to distinguish between exercises of market power and aggressive business behavior that results in social benefits. Application of economic theory to specific cases allows courts to make that distinction. Promoting scale economies is one example of business behavior that improves social welfare that could be confused with the exercise of market power. Courts can use the work of economists to identify and allow realization of scale economies. As the arbiters of what constitutes beneficial economic behavior, courts have the responsibility to do so.

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176. Id.
177. Id.
178. See notes 169, 172 supra and accompanying text.