American Economic Association

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Source: *The Journal of Economic Perspectives*, Vol. 17, No. 4 (Autumn, 2003), pp. 3-26
Published by: American Economic Association
Stable URL: http://www.jstor.org/stable/3216929
Accessed: 11-08-2016 18:41 UTC

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Journal of Economic Perspectives—Volume 17, Number 4—Fall 2003—Pages 3–26

Does Antitrust Policy Improve Consumer Welfare? Assessing the Evidence

Robert W. Crandall and Clifford Winston

Should the United States pursue a vigorous antitrust policy? Soon after the passage of the Sherman Antitrust Act of 1890, economists led by John Bates Clark (1901) argued that the enforcement of such laws should be informed by the prevailing economic theory on the merits of competition and the extent to which firms' conduct can enhance or weaken competition. However, economic theory since then has proven remarkably fertile in pointing out how various actions by firms may be interpreted as either procompetitive or anticompetitive. For example, when prices decline sufficiently so that no firm in an industry is earning economic profits and some firms exit, this outcome may reflect a highly competitive market adjusting to a condition of temporary oversupply, or it could indicate that a large competitor is employing a strategy of predatory pricing to drive out its rivals. Similarly, when a firm builds a large factory, it may be engaged in vigorous competition and new entry, or it may be creating excess capacity as an implicit threat to potential competitors that it may raise output and cut price quickly if circumstances warrant. Although economic theory can help organize analysis of the economic variables affected by antitrust policy, it often offers little policy guidance because almost any action by a firm short of outright price fixing can turn out to have procompetitive or anticompetitive consequences.

Given this range of theoretical possibilities, the case for a tough and broad antitrust policy must rest on empirical evidence that shows that such policies have worked in the broad social interest. In this paper, we argue that the current empirical record of antitrust enforcement is weak. We start with an overview of the budgets and actions of the federal government's antitrust authorities. We then synthesize the available research regarding the economic effects of three major areas of antitrust policy and enforcement: changing the structure or behavior of

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monopolies; prosecuting firms that engage in anticompetitive practices, namely, price fixing and other forms of collusion; and reviewing proposed mergers. We find little empirical evidence that past interventions have provided much direct benefit to consumers or significantly deterred anticompetitive behavior.[1] We acknowledge that the literature has not been able to utilize all potentially fruitful sources of data and has rarely implemented recent empirical advances in industrial organization to analyze the effects of specific antitrust cases. Thus, the state of knowledge is not at a point where we are ready to make sweeping policy recommendations. Nonetheless, the economics profession should conclude that until it can provide some hard evidence that identifies where the antitrust authorities are significantly improving consumer welfare and can explain why some enforcement actions and remedies are helpful and others are not, those authorities would be well advised to prosecute only the most egregious anticompetitive violations.

The Scope of Antitrust Activity

U.S. antitrust enforcement is primarily the responsibility of the Department of Justice and the Federal Trade Commission (FTC). (There are also state antitrust laws that are enforced by state attorneys general, but the federal activity is far more pervasive.) The Department of Justice enforces Section 1 of the Sherman Act prohibiting contracts, combinations and conspiracies in restraint of trade and also enforces Section 2 of the Sherman Act prohibiting actions to monopolize or attempts to monopolize markets. The Department of Justice and the FTC enforce Section 7 of the Clayton Antitrust Act of 1914 prohibiting mergers between firms that threaten to reduce competition substantially in any line of commerce. The Clayton Act also prohibits anticompetitive practices like tying arrangements (where consumers are forced to purchase from a firm a product like razor blades when they buy the firm's razors) and disallows competing firms from having overlapping boards of directors. The FTC may also initiate cases under Section 5 of the Federal Trade Commission Act for "unfair methods of competition," thereby providing it with the ability to combat abuses that DOJ attacks under Sections 1 and 2 of the Sherman Act. For example, the FTC initially investigated Microsoft for possible anticompetitive practices. The Department of Justice subsequently brought its Section 2 case after the FTC did not bring a complaint.

Data on investigations and budgets for the Department of Justice and the FTC, publicly available for only the past 20 years, are summarized in Table 1. Monopolization cases constitute a small share of antitrust investigations in a given year, but

[1] Our focus is on academic assessments of antitrust policy, not studies conducted by federal agencies. In fact, there are very few government assessments of the economic effects of past antitrust decisions. When the government examined the outcome of mergers or divestiture orders, its focus has typically not been on competition or consumer welfare, but on the viability of the proposed action. For example, the Federal Trade Commission's Bureau of Competition (1999) examined the viability of divestitures in 35 merger cases between 1990 and 1994 in which divestiture orders were issued as a condition for approving the merger.

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Table 1

DOJ Antitrust Division and FTC Investigations and Budgets: 1981, 1991, 2000

(*in millions of year 2000 inflation-adjusted dollars*)

	Investigations			
Agency	*Conduct*	*1981*	*1991*	*2000*
Antitrust Division	Monopolies	8	5	8
	Mergers	66	92	177
	Price Fixing	145	77	82
FTC	Mergers	104	136	189
TOTAL		323	310	456
	Budgets			
Agency	*Conduct*	*1981*	*1991*	*2000*
Antitrust Division[a]	Monopolies and Mergers	$31.1	$23.3	$57.2
	Price Fixing	$22.2	$24.6	$30.7
FTC[b]	Mergers	$54.4	$45.5	$59.0
TOTAL		$107.7	$93.4	$146.9

Sources: U.S. Budget, 1982, 1992, 2002; Department of Justice Budget, FY 1981, 1991, 2000; Antitrust Division Workload Statistics 1981–1990, 1991–2000; 5th, 14th and 23rd Annual Hart-Scott Rodino Report (FY 1981, 1991 and 2000).

[a] Antitrust Division budgetary information does not distinguish between expenditures on monopoly and merger cases.

[b] Although its primary antitrust responsibility concerns mergers, the FTC also occasionally brings cases related to tying arrangements, price discrimination and unfair methods of competition under provisions of the Clayton Act and the Federal Trade Commission Act.

they still absorb a moderate fraction of the Department of Justice antitrust budget. DOJ investigated a declining number of price fixing allegations and other potentially collusive arrangements such as vertical market restraints during this period, but still spent at least one-third of its budget on this activity. Investigations of proposed mergers currently account for the largest share of antitrust activity, with the FTC handling slightly more mergers than the Department of Justice. Until recently, the FTC's budget for mergers was equal to the budget of the Antitrust Division of the Department of Justice for all its investigations.

Total resources consumed by antitrust enforcement, however, amount to much more than government antitrust agency expenditures shown in Table 1. Firms involved in antitrust cases must pay for legal advice, particularly in obtaining approvals for mergers and acquisitions. Fisher and Lande (1983) estimate that a merger case cost a firm as much as $1.5 million during the 1980s. Firms that face a lawsuit must pay for their defense, which could involve a lengthy trial and subsequent appeals. Antitrust cases also require the time and resources of management and critical staff to address issues of firm conduct, to provide financial information and so on. We are not aware of estimates of the costs to firms caused by antitrust investigations and court proceedings, but they undoubtedly run into the billions of dollars per year. Finally, the largest cost of antitrust enforcement may

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be that firms are discouraged from pursuing potentially efficient mergers, taking competitive pricing actions, developing new products or making new investments for fear of being embroiled in an antitrust action, especially if competitors use the antitrust authorities to block one another. Of course, the gains to consumers from curbing anticompetitive offenses could potentially outweigh these enforcement costs.

The ideal way to determine whether consumers have benefited from antitrust policy and enforcement in the areas of monopolization, collusion and mergers would be to compare consumer welfare with and without antitrust policy, all else constant.[2] However, twentieth-century U.S. history has offered only one example of this counterfactual. During the Great Depression, antitrust laws were suspended for designated industries for a time as a byproduct of the 1933 National Industrial Recovery Act. Bittlingmayer (1995) studied this episode and found that prices did not rise, an intriguing finding, but dated and perhaps relevant only to the anomalous experience of the Great Depression. Other evidence is available from cases that compare prices before and after antitrust interventions or across industries subject to varying levels of antitrust enforcement.

Monopolization

The Department of Justice typically investigates fewer than ten potential monopolization violations a year. To prove monopolization, the government must demonstrate that a firm has power over price and output in a market *and* that this power derives from business decisions whose principal intent and effect was to exclude competition (Areeda, 1988). Remedies in monopolization cases may be characterized as structural, behavioral or a reduction in the control of intellectual property. Structural remedies involve court-ordered changes in a firm's or industry's structure, such as horizontal divestiture, in which two or more directly competing companies are created from the assets of the defendant, and vertical divestiture, where separate companies are created at different production stages. Behavioral remedies address some aspect of the firm's behavior that the government identified as anticompetitive, such as tying arrangements, collusive agreements to exclude competitors, predatory pricing and so on. An enforcement agency must monitor those prohibitions, and the courts are inevitably required to resolve issues that arise between the agency and the firm. Finally, relief may involve forcing the firm to give up or to license key intellectual property that is the source of the alleged monopoly power.

Monopolization cases are impossible to analyze *en masse*, because they involve different market conditions and alleged misconduct over time. We therefore investigate the efficacy of antitrust policy in curbing monopolization by focusing on some landmark cases during the past century, including Standard Oil, American

[2] Our assessment does not include cases involving allegations of price discrimination brought under Section 2 of the Clayton Act, because such cases have been relatively rare during the past 20 years.

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Tobacco, Alcoa, Paramount, United Shoe Machinery and AT&T. A detailed discussion of these and other cases and their effects on consumer welfare can be found in Crandall (2001). These cases are of particular interest here because the government prevailed in each of them and obtained substantial changes, leading to the expectation of consumer benefits. To be sure, these cases are decades old, but current law and attitudes toward monopolization are based on precedents established by such cases. We sketch each case and draw on the available empirical evidence to assess whether the remedy improved consumer welfare.

Standard Oil

During the late 1800s and early 1900s, the Standard Oil Company refined and marketed crude oil produced in Pennsylvania, Ohio, Indiana and several surrounding states and developed transportation and production facilities. Complaints about its business practices took various forms. Standard Oil was alleged to have used ruthless tactics in negotiating contracts with railroads and in denying independent oil companies access to its pipelines and transportation facilities. It was also alleged to have engaged in predatory pricing to drive rivals from the market, a claim disputed by McGee (1958). Public authorities feared that the Standard Oil "Trust," which pooled the company's profits, was a source of market power and facilitated price fixing. In 1911, the U.S. Supreme Court upheld a 1909 lower court decision that Standard Oil had violated Sections 1 and 2 of the Sherman Act by attempting to monopolize the country's petroleum industry and using its New Jersey Trust to restrain trade (*Standard Oil Company of New Jersey v. United States*, 221 U.S. 1 [1911]). The court's decree required that the Trust be dissolved, resulting in 38 separate and independent companies that were prohibited from being controlled by a single entity.

The government presumably expected the breakup of Standard Oil to reduce U.S. refined petroleum product prices and perhaps also to reduce monopsony power over crude oil prices. Because of new oil discoveries, real crude oil prices were falling even before Standard Oil was brought to trial and actually rose somewhat after the breakup, as shown in Figure 1. Kerosene and gasoline prices fluctuated after the decree was entered. As a simple formal analysis, we collected annual time series data from 1889–1917, and we regressed real U.S. crude oil prices on GNP, total automobile registrations and total electricity production (which control for major influences on petroleum demand), a time trend from 1889–1900 that controls for the opening up of new western U.S. fields that increased petroleum supply, and a dissolution dummy (defined as 1 for 1912–1917, 0 otherwise). The coefficient for the dissolution dummy was actually positive, 0.50, but statistically insignificant with a t-statistic of 0.88. (The dummy's sign and significance was not affected when we deleted some of the explanatory variables.)

Earlier commentators have also concluded that the breakup of Standard Oil had little effect on either consumers or on profits, because Standard's alleged market power had already declined substantially from its heyday. For example, Standard Oil's market share of refinery capacity in the United States had fallen before the decree from 82 percent in 1899 to 64 percent in 1911 as oil-producing

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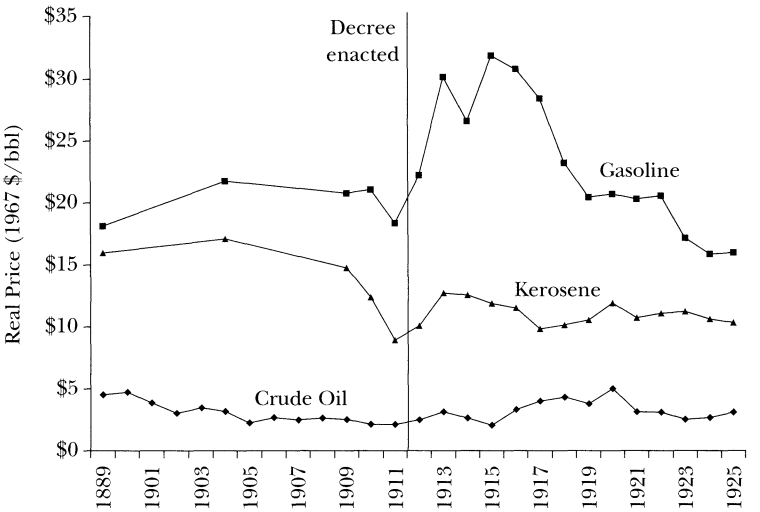
Figure 1
Real Petroleum Product Prices, 1899–1925



Notes: Gasoline and kerosene prices are deflated by the Consumer Price Index for all urban consumers. Crude oil prices are deflated by the GNP deflator.
Sources: Williamson et al. (1963); U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition* 224, 593-594 (U.S. Department of Commerce, 1975); Bureau of Labor Statistics internet.

regions in the mid-Continent, Gulf of Mexico and western regions developed, and well-capitalized independents such as Gulf Oil, Union Oil, the Texas Company, Sun Oil, Phillips and Cities Service provided competition. By 1920, Standard's share of refined petroleum products had fallen to 50 percent, but this decline was simply an extension of an earlier trend (Comanor and Scherer, 1995; Williamson et al., 1963). In addition, the breakup of Standard into a large number of separate companies did not dilute the Rockefeller family's control over the new entities. Thus, Burns (1977) concludes that the stock market interpreted the Standard Oil decree as "benign." The decree might have promoted competition had it been imposed before 1900, but by 1911, the oil industry was much more competitive and the decree had little effect.

American Tobacco

The American Tobacco Company produced little and regular cigars, plug and smoking tobacco, snuff and cigarettes. By 1910, it accounted for at least 75 percent of U.S. sales of each product, except for its smaller share of regular cigars. Organized as a trust, it obtained its market position by acquiring firms such as Union Tobacco Company and the Continental Tobacco Company and by aggressive pricing behavior, which allegedly often resulted in prices below manufacturing costs (Tennant, 1950). In 1908, the federal government filed and won a Sherman Act case against American Tobacco that sought to dissolve the trust. After the Supreme Court found that the trial court's initial dissolution

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remedy was extreme, the court entered a decree in *United States v. American Tobacco* (221 U.S. 106 [1911]) that divided cigarette production into three separate parts: American Tobacco kept assets that accounted for roughly 37 percent of U.S. production, P. Lorillard had 15 percent and a new company, Liggett and Myers, was provided with assets to produce brands that accounted for 28 percent of output. Assets devoted to plug and smoking tobacco and cigars were divided similarly.

However, the effect of restructuring the tobacco industry into a three-firm oligopoly was to unleash a battle for market share through advertising, not price (Tennant, 1950). Real cigarette prices were essentially stable in the few years preceding and following the decree, and they rose several years later in response to increases in tobacco excise taxes. The breakup of American Tobacco also did not affect the price paid to farmers for tobacco. Absent price competition, the three-firm oligopoly was highly profitable, essentially earning the same profit rate during 1912–1949 as the Trust earned during 1898–1908. The stability of the industry's profit rate and the absence of any clear decline in prices after 1911 suggest that the American Tobacco case did little to spur meaningful competition in this industry.

Alcoa

The Aluminum Company of America ("Alcoa"), formerly the Pittsburgh Reduction Company, took its name in 1907 and by 1909 was integrated backward into mining ore and forward into fabricating products. Alcoa also controlled Aluminum Limited of Canada, the largest source of aluminum imports into the United States at the time. The production of aluminum consists of mining aluminum ore (usually bauxite), refining the ore to extract alumina, reducing alumina into aluminum ingot and fabricating the ingot into mill products like sheet, tube and wire. In 1912, the Department of Justice charged Alcoa with restraining trade and monopolizing the aluminum industry. Alcoa signed a consent decree that required it to give up its interest in its Canadian subsidiary, to terminate a contract with two chemical firms whose bauxite it had purchased, not to participate in any collusive agreements or mergers and not to discriminate against any competing fabricator in the sale of ingot.

But the decree did not reduce Alcoa's dominance of a very small market that, with economies of scale, could probably support only one supplier. By the late 1930s, Alcoa's primary production and imports still constituted 90 percent of the supply of aluminum in the United States. In 1937, the Department of Justice filed a Sherman Act civil suit, again charging Alcoa with monopolizing the aluminum market and restraining trade. The government appealed the District Court's "not guilty" verdict to the Supreme Court, which could not muster a quorum because many justices had previously worked on the case. Legislation was enacted to allow the three senior judges of the Circuit Court of Appeals with territorial jurisdiction to serve as the ultimate appellate court. In *United States v. Aluminum Company of America*, 148 F.2d 416 (2d Cir. 1945), Judge Learned Hand reversed the lower court's decision, concluding that Alcoa had monopolized the market for primary aluminum and had engaged in a price squeeze from 1925 to 1932 by selling some

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aluminum sheet at prices that were too close to the price of primary aluminum ingot to allow independent fabricators to achieve adequate margins on their sales of aluminum sheet. Judge Hand did not rest his opinion on this violation, but identified it as a major problem to be dealt with in designing a remedy.

The final decree was postponed until after World War II, during which the government had constructed plants for alumina reduction, aluminum smelting and fabrication. Crandall (2001) provides empirical evidence that the decree had no effect on real aluminum prices and little effect on the margin between fabricated aluminum products and primary aluminum. After the war, virtually all of the government's aluminum properties were assigned to Reynolds Metals and Kaiser (then Permanente Metals Corporation), thus creating two viable competitors. In 1950, the District Court ruled against Alcoa's divestiture, but the court retained jurisdiction over the case for five years in the event that the two new competitors did not provide sufficient competition. Three additional companies entered the primary aluminum market between 1950 and 1955, again with government assistance, and in 1956 District Judge Cashin found sufficient evidence of competition and ruled against another five-year test.[3]

The failure of the first decree in 1912 to erode Alcoa's monopoly position derived from the small and even declining market for aluminum that by the early and mid-1930s amounted to fewer than 150,000 tons per year. In contrast, the second decree in 1945 required little of Alcoa because government programs dispersed production facilities to new entrants. When annual demand for aluminum grew in the 1940s and 1950s to more than 1.25 million tons, it is quite likely that more firms would have entered the market even without government assistance. Given that Alcoa could not control the supply of the two most important inputs to aluminum production, bauxite and electricity, it is difficult to conclude that it could have blocked entry after World War II. Moreover, the market was sufficiently large so that Alcoa did not exhibit the characteristics of a natural monopoly. By 1955, Alcoa's market share was less than half of what it was when the government filed its 1937 lawsuit, yet its output was more than four times greater.

Paramount

The motion picture industry is composed of movie studios, film distributors and theatres. During the 1930s, some distributors owned theatre chains. The defendants in the Paramount case, initially brought in 1938, were five major distributors that owned theatres and three "minor" distributors, which together controlled 95 percent of total film rentals in the early 1940s (Conant, 1960). In 1946, a U.S. District Court found that the distributors had engaged in several practices that violated the Sherman Act, including fixing admission prices and restricting output to competing theatres through tying arrangements and "formula

[3] The court reporter numbers for the key decisions in the Alcoa case include *United States v. Aluminum Company of America,* 44 F. Supp. 97 (S.D.N.Y. 1941); *United States v. Aluminum Company of America,* 148 F.2d 416 (2d Cir. 1945); *United States v. Aluminum Company of America,* 91 F. Supp. 333 (S.D.N.Y. 1950).

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deals." The District Court's decree did not order divestiture, but prohibited agreements to maintain uniform prices and required a system of competitive bidding among theatres for each run of a feature film. The U.S. Supreme Court, however, found the bidding system unworkable and in *United States v. Paramount Pictures* (334 U.S. 131 [1948]), it ordered the lower court to reconsider divestiture. By the early 1950s, the five major distributors had completely divested their theatre chains.

The primary objective of the decree was to force distributors to compete for theatre space by offering attractive terms for renting their films. Independent distributors would presumably have better access to theatres, and new distributors might even enter. Under this scenario, admission prices would fall and the number of film distributors and annual film releases would increase. In fact, the average real price of a movie ticket rose in the two decades following the *Paramount* decision; specifically, the Consumer Price Index for indoor theatres rose 36.4 percent between 1948 and 1958, while the overall CPI rose just 20.1 percent. The trend continued during 1958–1967, with the CPI for indoor theatres rising 68.9 percent, while the overall CPI rose just 15.5 percent. In addition, little entry occurred into motion picture distribution. Twenty years after the *Paramount* litigation, seven of the original eight defendants accounted for nearly three-fourths of all U.S. theatrical rentals (Crandall, 1975).

Two interpretations are possible. Either the defendants' original actions were not raising ticket prices and restricting output, in which case the antitrust suit should not have been filed, or the decree failed to end collusive behavior. A fundamental problem in analyzing the postdecree market is evaluating how the introduction of television affected theatrical admissions, which declined dramatically. New entrants and independents may have fared poorly under these market conditions, and after decades of agreeing on clearances and lengths of runs, the *Paramount* defendants may have been able to coordinate a cartel agreement by reporting their weekly revenues from each theatre to the trade press. Distributors' share of theatrical admission receipts rose from 30.4 percent in 1948 to 45.8 percent in 1967. Thus, distributors captured approximately two-thirds of the 66 percent increase in real ticket prices during this period.

United Shoe Machinery

United Shoe Machinery manufactured a full line of machines used to produce shoes. By the 1940s, USM offered more than 300 types of machines, of which a shoe manufacturer might need as many as 100 to produce a shoe (Masten and Snyder, 1993). USM sold and leased its machines and provided repair and advisory services. In 1949, its market share of major machines was 91 percent, and its share of minor machines was 64 percent (Kaysen, 1956). The government claimed that USM had monopolized the shoe machinery market through leases that impeded the purchase or lease of its competitors' machines and prevented the development of a secondhand market. Exclusionary provisions of USM's leases included ten-year terms and a "full capacity" clause that required lessees to use each machine to the fullest extent possible (Masten and Snyder, 1993). USM would charge shoe manufacturers with violating this clause

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if they switched to a competitor's machine, but waived the penalties if the cancellation was caused by changes in demand, conversion to manual operations or replacement with another USM machine.

In *United States v. United Shoe Machinery* (110 F. Supp. 295 [D.Mass. 1953], aff'd. 347 U.S. 521 [1954]), the U.S. Supreme Court upheld a lower court decision that USM had illegally monopolized the shoe machinery market. The trial court declined to order the dissolution of USM, but structured a decree that prohibited USM from designing its lease and sales terms to make it substantially more advantageous to lease machines. In addition, the duration of all new leases had to be reduced to five years or less with an option to return machines after one year. Return charges or deferred payments were banned. The decree was intended to increase competition by encouraging the purchase of machines, thus creating a vibrant secondhand market, and inducing shoe manufactures to be more receptive to machines offered by USM's competitors.

The decree did succeed in establishing a secondhand market for machines and reducing USM's market share from roughly 85 percent in 1953 to 62 percent in 1963 (Parrish, 1973). On the other hand, USM's revenue gains were more than twice the sum of its four major competitors' gains, and its return on equity remained relatively constant. The heterogeneity of shoe machinery prevents a direct assessment of shoe machinery prices before and after the decree. However, if the decree succeeded in reducing machinery prices, it is highly likely that shoe manufacturers would have incurred lower machinery expenses relative to the value of shoes produced. But based on data from the *Census of Manufacturers*, the ratio of the value of shoe machinery shipments to the value of shoe shipments remained at 0.012 between 1954 and 1967. (It is conceivable that the stability of relative shipment values could have reflected lower machinery prices and a substitution of machinery for labor in shoe production technology during this period, but no evidence exists to support this conjecture.)

In any event, the U.S. Supreme Court was not satisfied that sufficient competition had developed in the shoe machinery market, because following a review of the decree, it recommended in 1969 that the lower court consider "more definitive means" to achieve competition. As a result, USM was forced to divest itself of roughly one-third of its remaining shoe machinery operations. Unfortunately, the government required structural relief only after the shoe industry had entered a steep decline because of the rise in imported shoes. It has even been speculated that the USM decree accelerated the demise of U.S. shoe manufacturing, but we are not aware of evidence to support this conclusion.

AT&T

In 1974, the U.S. Department of Justice brought a monopolization case against AT&T, which eventually led to a 1982 consent decree that divested AT&T of its local operating companies, creating in 1984 seven regional Bell companies that provide local phone service. AT&T retained its long distance operations and a telephone equipment company that is now called Lucent. Following the breakup, long distance telephone competition dramatically increased and rates fell, so there

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is at least some *prima facie* evidence that consumers benefited from this monopolization case.

But on closer examination, the rise in competition and lower long distance prices are attributable to just one aspect of the 1982 decree; specifically, a requirement that the Bell companies modify their switching facilities to provide equal access to all long distance carriers. The Federal Communications Commission (FCC) could have promulgated such a requirement without the intervention of the antitrust authorities. For example, the Canadian regulatory commission imposed equal access on its vertically integrated carriers, including Bell Canada, in 1993. As a result, long distance competition developed much more rapidly in Canada than it had in the United States (Crandall and Hazlett, 2001). The FCC, however, was trying to block MCI from competing in ordinary long distance services when the AT&T case was filed by the Department of Justice in 1974. In contrast to Canadian and more recent European experience, a lengthy antitrust battle and a disruptive vertical dissolution were required in the U.S. market to offset the FCC's anticompetitive policies. Thus, antitrust policy did not triumph in this case over restrictive practices by a monopolist to block competition, but instead it overcame anticompetitive policies by a federal regulatory agency.

Overall Lessons and Recent Monopoly Cases

This brief overview of landmark monopolization cases suggests several reasons why such cases have often failed to increase competition to the benefit of consumers.

One problem is the protracted length of these cases, which often take so long that industry competition has changed before the remedy is implemented, as in *Standard Oil* and *Alcoa*. This problem has also arisen in modern monopolization cases, like those involving IBM and Microsoft. The first monopolization case against IBM was brought in 1952 and settled by consent decree in 1956, but there is little evidence that it had favorable effects on competition in the computer industry, which was rapidly replacing tabulating machines with mainframe computers (Wilder, 1975). IBM quickly vaulted to a dominant position in mainframes, leading the Department of Justice to file another case in 1969. That case was dropped in 1982, in no small part because the market had changed once again (Fisher, McGowan and Greenwood, 1983). The ultimate merits of the *Microsoft* case are not yet clear, but it has already required six years of litigation (excluding the FTC's earlier investigation), and the court's final judgment is still being appealed. By the time it is resolved, the information technology market is likely to have changed substantially.

Another major problem occurs when a monopolization case simply fails to benefit consumers because the remedy turns out to have a negligible practical impact, as may have happened in *American Tobacco*, *Paramount* and *United Shoe Machinery*. Recently, a number of monopoly cases like those filed against Safeway and A&P were brought in an attempt to stop the replacement of small grocery stores by large national food chains, but these cases have had little effect on market

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concentration because they could not prevent more efficient chains from replacing less efficient small retailers (Crandall and Elzinga, 2002).

Similarly, airlines that dominate hub airports have been accused of having monopoly power and in some cases of engaging in predatory pricing behavior to protect hub markets. In 1999, the Department of Justice filed a predatory pricing suit against American Airlines—but lost on summary judgment. Morrison and Winston (2000) cast doubt on the claim that airlines are successfully engaging in predatory behavior. They also show that fares may be higher on hub routes than on other routes because a hub carrier has market power or because low-cost Southwest Airlines mainly serves nonhub routes and significantly depresses fares in these markets. In any case, the cost to travelers from a hub "premium" is clearly offset by hub benefits, including greater flight frequency and agglomeration economies in areas surrounding the airport.

Challenging large firms in court is often politically popular, but neither policymakers nor economists have yet to offer compelling evidence of marked consumer gains from antitrust policy toward monopolization.

Collusion

Explicit agreements to fix prices are often treated by the antitrust authorities and the courts as *per se* violations, which means that evidence of an agreement is sufficient to prove guilt. A wide variety of other restrictive practices are potentially collusive—including exclusive contracts, exclusive territories and others. The courts have generally adopted a "rule of reason" standard for these practices, which means that they are judged on a case-by-case basis with earlier precedents in mind.[4] The Department of Justice investigates about 100 allegations of price fixing a year and often proceeds with indictments.

Retrospective assessments of some of these cases have failed to find much direct benefit from curbing alleged instances of collusion. (Besides price fixing, very few empirical studies exist of cases involving collusive practices.) For example, Newmark (1988) found that an antitrust indictment of bakers in Seattle had no effect on the price of bread, and Morrison and Winston (1996) concluded that a consent decree that prohibited airlines from announcing the ending dates of their fare promotions had no effect on fares. More systematically, Sproul (1993) analyzed a sample of 25 price fixing cases between 1973 and 1984 for which usable price data were available. He argued that if a cartel succeeds in raising prices, then prosecution should lower them. However, he found that, controlling for other influences,

[4] Under resale price maintenance agreements, for example, a producer of a product sets a price that the retailer may not undercut. The procompetitive argument for such agreements is that they encourage the retailer to invest in knowledge and service about the product. The likelihood of prosecution in such cases was substantially reduced by a 1997 Supreme Court decision (*State Oil Company v. Khan,* 522 U.S. 3 [1997]). Also, Ippolito and Overstreet (1996) provide some evidence that resale price maintenance produced efficiency gains.

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prices *rose* an average of 7 percent four years after an indictment. Sproul also found that prices rose, on average, even if one uses a starting point during the investigation but before the indictment. Even in the most successful cases, prices fell only 10 percent.

One possible explanation for why these cases have not generally resulted in price declines is that the Department of Justice may in some instances be prosecuting firms that are engaging in activities that involve other goals besides raising prices. For example, Sproul (1993) suggests that a cartel may reduce costs through shared advertising and research, which may tend to reduce prices rather than to increase them. Another possibility is that a cartel may be pursuing distributional goals. For instance, MIT and Ivy League colleges established a tradition of coordinating their need-based financial aid decisions. The schools claimed that the so-called Overlap process enabled them to concentrate their scarce financial resources on needy students without affecting their total revenues. The government sued, claiming that the schools were conspiring on financial aid policies to reduce aid and raise revenues. Carlton, Bamberger and Epstein (1995) found that the process did not have a statistically significant effect on the average "price" paid per student, but that it prevented the flow of school resources from lower- to higher-income students. Hoxby (2000) corroborates this finding.

To be sure, there are well known examples where firms have clearly colluded to raise prices, including recent cases involving lysine, citric acid and vitamins. However, researchers have not shown that government prosecution of alleged collusion has systematically led to significant nontransitory declines in consumer prices.

Mergers

Department of Justice and Federal Trade Commission investigations of proposed mergers absorb more than half of federal antitrust resources. The Hart-Scott-Rodino Antitrust Improvement Act of 1976 requires any firm valued over $100 million to file a premerger notification under various conditions, the most common of which is that it plans to merge with another firm valued at more than $50 million. After filing the notification, firms must wait 30 days before they can proceed with the merger. During this period, the FTC or the Department of Justice can request additional time and information (known as a "second request") before deciding whether to approve or oppose the merger.

Mergers may harm or benefit consumers. Mergers that enable firms to acquire market power may only raise consumer prices, while mergers that enable firms to realize operational and managerial efficiencies can reduce costs and thereby lower prices. Economists generally conclude that taken as a group, mergers are not anticompetitive. Andrade, Mitchell and Stafford (2001) argue that mergers through the 1990s have produced efficiency improvements leading to a modest 1 percent gain in postmerger operating margins. Carlton and Perloff (1994) claim that the increase in shareholder value from a merger in the United States is not

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typically due to the creation of market power. But even if one accepts that the average merger results in an efficiency gain, antitrust enforcement could be good or bad, depending on how well the antitrust authorities distinguish procompetitive mergers from anticompetitive ones.

How can a researcher sort out whether the mergers that are blocked or that have conditions attached by the Department of Justice or the FTC are the ones that would have led to anticompetitive outcomes and welfare losses? With a monopoly, one can observe its impact on consumers before and after antitrust action. But a blocked merger is never observed, and thus its effects cannot be compared directly to what would have happened if the merger had been allowed. This difficulty helps to explain why we could not find any case studies that showed that the FTC or Department of Justice prevented significant welfare losses by blocking or attaching conditions to a proposed merger.[5]

One approach to investigating whether the antitrust authorities can distinguish good from bad mergers is to look at stock price data, which is presumably forward looking, to test the hypothesis that horizontal mergers challenged by the government would have created market power in the defendants' industries. This is done by estimating whether proposed merger-induced changes in expected future product and factor prices translate into positive abnormal stock returns to firms competing in the same industry as well as to the merging firms. Eckbo's (1992) conclusion from this literature is that the mergers that were challenged were not anticompetitive and in all likelihood would have been efficient had they been allowed to go through.

Another approach is to consider whether the reporting requirements of the Hart-Scott-Rodino Act of 1976 have enabled the antitrust agencies to judge a merger's competitive impact better before filing a complaint. Eckbo and Wier (1985) use stock price data to analyze merger cases filed after 1978 and find that the proposed mergers would not have harmed competition. Thus, they conclude that the act has not helped the agencies improve their case selection record.

Still another approach is to look at mergers that were challenged or opposed by the antitrust regulators, but were consummated anyway. Such mergers have often worked well for consumers. For example, the FTC unsuccessfully challenged Weyerhaeuser's acquisition of Menasha, which led to a decline in corrugated box prices (Schumann, Reitzes and Rogers, 1997). Similarly, the Department of Justice opposed airline mergers between TWA and Ozark and between Northwest and Republic. However, the Department of Transportation allowed the two mergers.

[5] Pittman (1990) estimates that the Santa Fe/Southern Pacific rail merger, which was opposed by the Department of Justice and blocked by the Interstate Commerce Commission, would have led to annual operating cost savings by the carriers, but deadweight losses of roughly $100 million. Southern Pacific, however, had failed to become "revenue adequate" and probably could only survive with a merger. Indeed, it subsequently merged with Union Pacific, which led to disastrous service disruptions in the southwest that cost shippers billions of dollars. In any case, many observers of the rail industry envision that the "final frontier" of the industry is for the two remaining railroads in the East and the two in the West to form two efficient transcontinental railroads (Grimm and Winston, 2000).

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Morrison (1996) conducted a long-run analysis that improved upon previous airline merger assessments by considering fares well before and up to the merger and fares immediately and several years after the merger. He found that the TWA-Ozark merger led to a 15 percent decline in fares and that the Northwest-Republic merger led to a 2 percent increase in fares, which may have been offset by benefits from greater route coverage.

We now turn to a broad assessment of recent merger policy based on price-cost margins across industries. Although there are well known measurement concerns with using price-cost margins, greater market power should increase them, *ceteris paribus*. We also recognize that using interindustry data to explain price-cost margins can be problematic. But this line of research has matured to the point where it has produced a set of "stylized facts" about industry competition (Schmalensee, 1989). Our hope is that the suggestive findings from this exercise will be viewed in combination with other researchers' findings about the effects of antitrust merger policy, rather than dismissed on doctrinal grounds.

For our dependent variable, we use price-cost margins from 1984 to 1996 for the 20 manufacturing industries that are defined at the two-digit SIC level (using the pre-1997 classification system). We choose this time period and sample based on data availability. Outcomes of merger cases are available back to 1982. However, we will specify merger enforcement variables with two-year lags (see below), thus we can analyze price-cost margins only as far back as 1984. In addition, case outcomes are publicly available only at the two-digit level of aggregation, while consistent estimates of industry price-cost margins are available only for manufacturing industries.

In our regression, price-cost margins are assumed to be influenced by court-based outcomes, second requests for information and industry characteristics. The court-based outcomes we include are the number of successful and unsuccessful merger challenges, as well as the number of consent decrees reached by the government and the firms proposing to merge. In a given year, the vast majority of these court-based outcomes are consent decrees; during the period covered by our sample, there were nine cases that went to a verdict and 88 cases settled by a consent decree. Our sample also contains 368 second requests for information, which may have discouraged some of the proposed mergers from moving forward. Each case is only counted once even if there were multiple decisions. An industry is not likely to experience the effect of antitrust merger policy immediately; thus, the estimation is based on two-year lags for the court-based outcomes and second requests. Following previous specifications like that of Salinger (1990), we include the following industry characteristics: the import-sales ratio, to control for foreign competition; the capital-sales ratio, to control for technology; and the growth of the number of firms in an industry with a five-year lag (because this lag provided the best statistical fit), to control for entry.[6]

[6] Of course, we experimented with this specification in various ways. For example, using one-year lags and no lags had little effect on the main findings. Our findings did not change when we specified court-based outcomes and second requests as a percentage of the total mergers proposed in an industry

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If antitrust interventions against mergers are benefiting consumers, price-cost margins in an industry should fall from what they would have been when the government successfully challenges a merger in court or negotiates a consent decree. Second requests for information may also lower prices by discouraging anticompetitive mergers from moving forward. If antitrust investigations are focusing on mergers that primarily have efficiency effects, price-cost margins should rise from what they would have been when the government successfully challenges a merger in court or negotiates a consent decree because the merger, as proposed, would have reduced firms' costs.[7]

Our results are presented in Table 2. The parameter estimates of the industry characteristics are plausible. A higher import-sales ratio and firm growth reduces an industry's price-cost margin, as does an increase in an industry's capital-sales ratio. Salinger (1990) found that the capital-sales ratio had a positive effect on price-cost margins during the 1970s, but that its effect became negative during the early 1980s. This negative coefficient persisted during the 1980s downturn and expansion; the negative coefficient in Table 2 is consistent with this finding.

The coefficients of the court-based outcomes are of central interest and suggest that merger enforcement policy is primarily undermining mergers that would enhance efficiency, rather than protecting competition. We find that a successful merger challenge does have a negative effect on the price-cost margin, but that the effect is not statistically significant. In contrast, an unsuccessful challenge in which a court eventually allows the proposed merger is associated with a decline in price-cost margins, and the effect is statistically significant. The most optimistic interpretation to place on these findings is that potential challenges from antitrust authorities succeed in blocking or discouraging mergers that would reduce welfare and that the courts do not allow the regulators to block mergers that improve economic welfare. However, we believe that a more plausible interpretation, consistent with the findings reported earlier in the section and the statistically insignificant effect of second requests, is that the mergers blocked by antitrust authorities have no significant effect on price-cost margins in those

in a given year. They were also not affected when we specified separate coefficients for interventions by the Department of Justice and the FTC. We tried using industry fixed effects to control for unmeasured industry characteristics, but the parameters for the court-based outcomes and second requests were not affected if the fixed effects were excluded from the specification; thus, they are not included here. It is possible that merger policy could influence the rate of entry; thus, we estimated a model that dropped this variable, but found that this specification did not affect the parameters for the merger policy variables, so we kept it in the specification. We also estimated models that controlled for several other potential influences on the price-cost margin, including macroeconomic variables (unemployment, interest rates, GDP growth), year fixed effects, industry output growth, selected commodity dummies and a time trend, but these variables were statistically insignificant.

[7] If antitrust enforcement were fully optimal and complete, then all the enforcement variables should be statistically insignificant because the Department of Justice and FTC would have thwarted all anticompetitive attempts to raise price-cost margins and not thwarted mergers that would have lowered price-cost margins. The preceding summary of evidence suggests that it is extremely unlikely that merger policy has been optimal.

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Table 2
Price-Cost Margin Parameter Estimates
(*robust standard errors in parentheses*)

Variable	*Coefficient*
Court-Based Outcomes	
Mergers successfully blocked by FTC or DOJ (2-year lag)	−0.040 (0.032)
Mergers unsuccessfully challenged by FTC or DOJ (2-year lag)	−0.038[a] (0.011)
Consent decrees (2-year lag)	0.017[a] (0.004)
Other Outcomes	
Second request for information made by FTC or DOJ (2-year lag)	−0.001 (0.002)
Industry Characteristics	
Import-sales ratio	−0.071[a] (0.020)
Log of the growth of the number of firms (5-year lag)	−0.721[a] (0.188)
Capital-sales ratio	−0.105[a] (0.008)
Constant	0.518[a] (0.018)
R^2	0.45
Number of observations	260

[a] Statistically significant at the 1 percent level.
Notes: The *price-cost margin* variable is constructed following standard practice as (value added + Δ inventories − payroll)/(value of shipments + Δ inventories). Data for each of the components were obtained from the *Annual Survey of Manufacturers,* published by the Bureau of the Census, for 1984 to 1996.
For the *import-sales ratio* from 1984 to 1996, total imports were obtained from Robert Feenstra, who assembled data from the U.S. Department of Commerce and the *U.S. Industry and Trade Outlook.* Sales data, reported as shipments, were from the *Annual Survey of Manufacturers.*
Growth of the number of firms was obtained from the *Economic Census,* published every five years by the Bureau of the Census and from the annual *County Business Patterns* (CBP), also published by the Census. The *Economic Census* contains firm data, while the CBP contains plant data that were used to estimate the number of firms. The ratio of plants to firms in the "benchmark" years of 1977, 1982, 1987 and 1992 was used to generate an estimate for the growth of the number of firms on an annual basis.
For the *capital-sales ratio,* capital is measured as the historical cost of the net stock of fixed private capital and is from *Fixed Reproducible Tangible Wealth,* published by the Bureau of Economic Analysis within the Department of Commerce. For sales, see above.
Data on the number of mergers successfully challenged in court, mergers unsuccessfully challenged in court, consent decrees and second requests are from the Hart-Scott-Rodino Annual Reports, which are annual reports to Congress prepared jointly by the FTC and the Antitrust Division of the DOJ. Court outcomes were described in each report, and the SIC codes for the companies involved in the cases were determined by consulting FTC and DOJ case histories.

industries because the regulators are not sorting out good mergers from bad ones with much accuracy. Further, the negative and statistically significant coefficient of unsuccessful court challenges suggests that the antitrust authorities overreach and attempt to block productive mergers, although only a handful of merger cases actually reach a court verdict.

When the government and the potential merger partners reach a consent decree to gain regulatory approval for the merger, price-cost margins in the industry subsequently increase. In our data, the FTC and DOJ negotiated 45 percent of their consent decrees with companies that at that time were in two-digit industries located in the upper quintile of price-cost margins. This finding can be interpreted either as an argument that the antitrust authorities should have

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negotiated stronger conditions to address potential anticompetitive problems or that the consent decrees allowed mergers to go forward only when the firms were saddled with conditions that compromised production efficiencies. Neither interpretation is complimentary to the antitrust authorities.[8]

We do not want to overstate our confidence in the specific estimated coefficients from Table 2. It would clearly be preferable to have more disaggregated data for more industries. As we have noted, the findings can be interpreted in various ways. There are, of course, counterexamples of individual mergers that have raised prices (for example, Barton and Sherman, 1984). But the regression results are not biased in any particular direction and are broadly consistent with the other empirical evidence that we have surveyed. We can only conclude that efforts by antitrust authorities to block particular mergers or affect a merger's outcome by allowing it only if certain conditions are met under a consent decree have not been found to increase consumer welfare in any systematic way, and in some instances the intervention may even have reduced consumer welfare.

Deterring Anticompetitive Behavior

Given the lack of direct evidence that antitrust actions on monopolization, collusion and mergers have promoted competition and benefited consumers, supporters of an activist antitrust policy are left with the argument that such policy deters firms from anticompetitive behavior. If the authorities had not prosecuted IBM, AT&T, Microsoft and others, who knows what abuses would have occurred? Admittedly, providing evidence on what has been deterred, and therefore did not happen, is a difficult task. In any event, we have not found any evidence that antitrust enforcement has deterred firms from engaging in actions that would have seriously harmed consumers.

Historically, it has been suggested that government victories in *Standard Oil* and *American Tobacco* deterred other companies, such as U.S. Steel, from pursuing similar paths to monopoly power. However, Comanor and Scherer (1995) conclude that U.S. Steel's failure to maintain its large share of the country's steel output in the first half of the twentieth century was due to its high costs, not to a concerted effort to avoid antitrust prosecution.

International evidence has been used to assess the deterrence effect of the antitrust laws. Stigler (1966) compared concentration in specific industries in England, which at the time did not have a public policy against concentration of control, with the same industries in the United States and concluded that the

[8] It is possible that the mergers may have involved antitrust markets within a given two-digit industry that had price-cost margins that were quite different from a two-digit industry's average price-cost margin; for example, a merger may have occurred within a relatively concentrated subindustry of a relatively unconcentrated industry. Because we control for other systematic influences on two-digit industry price-cost margins, our methodology should uncover the impact of merger policy, albeit with a somewhat diluted effect. The extent of this dilution, however, is not clear; after all, we do find that two of the four merger policy variables had statistically significant effects.

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Sherman Act has had a very modest effect in reducing U.S. concentration. Eckbo (1992) explored whether the antitrust laws deter potentially anticompetitive mergers by estimating whether the probability that a horizontal merger is anticompetitive was higher in Canada, where until 1985 mergers were essentially unconstrained, than in the United States. His analysis compared estimated parameters in cross-section models that explained announcement stock returns to merging firms and their nonmerging industry rivals as a function of industry concentration in the two countries. Based on this comparison, he rejected the hypothesis that the U.S. antitrust laws are deterring anticompetitive mergers.

Although we have not found any evidence that the antitrust laws have had beneficial deterrence effects, we suspect that such effects exist. However, any deterrent effect of the antitrust laws may be relatively small compared with the well demonstrated ability of competitive markets to deter anticompetitive monopolies, collusion and mergers. We have identified a few of the many instances where erstwhile monopolies have seen their market shares eroded by new competitors: Standard Oil, U.S. Steel, Alcoa and IBM, for example. Moreover, collusion among firms is more difficult than it may appear. Stigler (1964) pointed out that even when few firms compete in a market, it may be difficult for them to reach a consensus on price and market shares, and even if they do, they may not be able to discourage cheating.

Empirical evidence from the rail, airline, ready-to-eat cereal and brewing industries illustrates some of the ways that markets prevent firms from successfully colluding. Beginning in the mid-1980s, electric utilities that received coal shipments from the Powder River Basin in Wyoming were served by only two railroads. Many economists would expect that the two carriers would be able to come to some arrangement that elevates rates above competitive levels. However, Gaskins (2001) found that rail rates in the Powder River Basin approached long-run marginal costs, suggesting that carriers were not colluding on prices. It seems that shippers are able to play one railroad off against another when negotiating long-term contracts to reduce their rates, because if a carrier does not compete fiercely for a shipper's traffic, it may have to wait several years before it has an opportunity to recapture any traffic that it loses (Grimm and Winston, 2000).

In April 1992, the president of American Airlines Robert L. Crandall attempted to introduce some discipline in airline pricing by urging other carriers to adopt American's pricing regimen of four basic fares and reduced full-fare coach and first-class fares. But American's influence was too limited to get other carriers to follow its lead (Morrison and Winston, 1995). By October 1992, Crandall abandoned the strategy, bemoaning: "We tried to provide some price leadership but it didn't work, so we are back into the death by a thousand cuts" (Lollar, 1992).

In contrast to railroads and airlines, the ready-to-eat cereal and brewing industries are characterized by persistently high price-cost margins. Economists have explored whether market power in these industries is attributable to collusive pricing behavior, but have rejected this explanation. Cereal firms (Nevo, 2001) and

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brewers (Baker and Bresnahan, 1985) have engaged in nonprice competition, particularly through advertising, to influence the perceived quality of their products and to elevate price-cost margins. Indeed, firms that produce differentiated products face less incentive to engage in and find it more difficult to maintain collusive agreements than firms that produce homogeneous products.

There is a widespread belief that the antitrust laws deter collusion more than they deter attempts to monopolize. Firms and individuals convicted of price fixing are subject to federal criminal penalties and also vulnerable to private suits for treble damages. Block, Nold and Sidak (1981) provide evidence that such class actions are the strongest deterrence against collusion. It is possible that the Department of Justice has succeeded in deterring the most serious instances of price fixing and has therefore been increasingly prosecuting marginal cases, but this surmise has not been documented. Recently, the Antitrust Division of the Department of Justice has attempted to strengthen deterrence by imposing higher fines on corporations for price fixing and expanding the use of corporate leniency for firms that disclose their role in a conspiracy and cooperate with the government. However, Kobayashi (2002) develops a model of optimal deterrence and cautions that these actions may lead to overdeterrence, which would induce excessive investments in monitoring and prevention, raise production costs and result in higher consumer prices.

Finally, the surrounding climate of market competition is also an important reason why most mergers are not anticompetitive. Indeed, Paulter's (2001) survey of the literature on mergers concludes that they "fail" 35 percent to 75 percent of the time, where failure is determined by survival, profitability, retention of assets and so on. Because of internal and external market forces, mergers have much less predictable outcomes than do most other business investments. It is also noteworthy that although the U.S. economy experienced major waves of large mergers during the 1980s and 1990s, aggregate concentration has not increased over the past two decades (White, 2002).

Most of U.S. industry is structurally competitive. For example, Pashigian (2000) used a government task force's definition of an imperfectly competitive market as one with a four-firm concentration ratio above 70 percent and found that in 1992 only 46 out of 398 four-digit U.S. manufacturing industries met this threshold.[9] In a competitive climate, monopolies will tend to be eroded, collusive

[9] This theme that the market is largely competitive is compatible with the common finding that the U.S. economy has experienced only a small deadweight loss from noncompetitive pricing. Harberger's (1954) initial finding of a deadweight loss of roughly 0.1 percent of GDP has been revisited by several authors. Cowling and Mueller (1978) found a much larger deadweight loss than other researchers because they included advertising expenditures as part of welfare losses. More recent estimates summarized by Ferguson (1988) indicate a deadweight loss of about 1 percent of GDP. These estimates of deadweight loss are not fully appropriate for our purposes, however. Our focus is on consumer benefits, which would involve transfers from consumers to firms, not just on deadweight loss. Moreover, the estimates of losses from imperfect competition include distortions caused by government interventions such as regulations and trade protection, but do not include possible offsetting dynamic benefits of imperfect competition, such as greater investments in R&D that lead to enhanced product quality and design.

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agreements will fall apart and mergers will either provide efficiency benefits or fail. Any additional deterrence antitrust policy provides should be evaluated in this context.[10]

Conclusion

The apparent ineffectiveness of antitrust policy stems from several causes: 1) the excessive duration of monopolization cases, which portends that the particular issue being addressed will evolve into something different—often of less importance—by the time it is resolved; 2) the difficulties in formulating effective remedies for monopolization and effective consent decrees for proposed mergers; 3) the difficulties in sorting out which mergers or instances of potentially anticompetitive behavior threaten consumer welfare; 4) the substantial and growing challenges of formulating and implementing effective antitrust policies in a new economy characterized by dynamic competition, rapid technological change and important intellectual property (Carlton and Gertner, 2002); 5) political forces that influence which antitrust cases are initiated, settled or dropped (Weingast and Moran, 1983; Coate, Higgins and McChesney, 1995), including situations where firms try to exploit the antitrust process to gain a competitive advantage over their rivals (Baumol and Ordover, 1985); 6) the power of the market as an effective force for spurring competition and curbing anticompetitive abuses, which leaves antitrust policy with relatively little to do.

We recognize that antitrust doctrines have changed and continue to change over time (Baker, 2002). Our concern is that these changes have not been motivated and guided by empirical assessments that identify which policies have and have not succeeded in increasing consumer welfare.

We also believe, however, that the evidence presented here would be more extensive and persuasive if researchers had greater access to potentially informative sources of data and employed the latest empirical developments in industrial organization. The Department of Justice and the FTC could help advance our knowledge of the effects of antitrust policy by making more data generated by cases available to researchers. Indeed, we were restricted to using two-digit industry classifications for court-based and other outcomes in mergers, even though the antitrust authorities have this information at a more disaggregated level. Baker and Rubinfeld (1999) survey models that economists have developed to analyze price fixing, mergers and oligopoly conduct, but fail to identify a single instance where

[10] In his response to this paper, Baker tries to advance the argument that antitrust policy has significant deterrence effects. But he fails to acknowledge that the influx of foreign competition, deregulation, the entry of new firms and the emergence of new technologies has created an extremely competitive environment for contemporary U.S. industry. Indeed, Baker's evidence regarding deterrence is mainly drawn from episodes that predate the current intensity of industry competition. Moreover, the antitrust authorities may deter firms from actions that either increase or decrease social welfare. Baker fails to provide a balanced quantitative assessment of the effects of deterrence, so we have no feel for the impact or even the sign of this component of antitrust policy.

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any of these models has been used to assess the welfare effects of antitrust policy. Clearly, economists should make greater efforts to use such methodological tools to aid our understanding of antitrust.

The present state of and gaps in our knowledge suggest a short-term and long-term course of action. Until economists have hard evidence that the current antitrust statutes and the institutions that administer them are generating social benefits, the Federal Trade Commission and the Department of Justice should focus on the most significant and egregious violations, such as blatant price fixing and merger-to-monopoly and treat most other apparent threats to competition with benign neglect. As the antitrust research agenda evolves, we envision that economists may identify cases where antitrust policy has improved consumer welfare. If they do, the long-term task will be to explain why certain policies have been counterproductive and others helpful and to provide guidance for how antitrust resources can be confined to beneficial activities.[11] A research agenda has emerged for those who are truly interested in improving the consumer welfare effects of antitrust policy and enforcement.

■ *Crandall has been employed as a consultant for Microsoft and various telecommunication companies. A long list of people provided us with helpful comments on previous drafts. We are grateful to them and the editors for their help and to David Zipper for research assistance.*

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[11] Baker's response initiates an all-purpose defense of antitrust policy, rather than distinguishing good antitrust policy from that which is ineffective, irrelevant or harmful.

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