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THE FAILURE OF STRUCTURAL REMEDIES IN SHERMAN ACT MONOPOLIZATION CASES

Robert W. Crandall*

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Considerable controversy has arisen around the recent U.S. District Court decision that ordered vertical divestiture of Microsoft as a remedy for its violation of section 2 of the Sherman Act. In this Article, I look back over more than a century of Sherman Act case law to see how frequently structural relief has been imposed in monopolization cases that involve a single firm that has not attained its market position through merger or from conspiring with other firms. I conclude that there are only four or five such cases in the history of Sherman Act enforcement. I then intensively examine the effectiveness of structural relief - vertical or horizontal divestiture - in seven of the most important section 2 cases and two others. I conclude that with one exception, the breakup of AT&T in 1984, there is very little evidence that such relief is successful in increasing competition, raising industry output, or reducing prices to consumers. The exception turns out to be a case of overkill because the same results could have been obtained through a simple regulatory rule, obviating the need for vertical divestiture of AT&T.

Introduction

On June 7, 2000, Judge Thomas Penfield Jackson ordered that Microsoft be broken into two separate companies as the remedy for its monopolization of the market for Intel-based PC software. n1 This ruling marked the first major antitrust divestiture [*110] since the 1982 consent decree that broke AT&T into seven operating companies and a long-distance/manufacturing company. n2 It is also one of only a handful of examples of such a breakup of a firm whose growth had not been the result of a series of mergers. Given the size of Microsoft, its position in the U.S. economy, and the drastic nature of the relief initially ordered, this case could have a major impact on American consumers. In this paper I look at the historical record for any evidence that such relief can work.

Among the best-known U.S. antitrust cases are those that have been brought by the government under section 2 of the Sherman Act, alleging that a firm or group of firms has "monopolized" a particular industry. Actions in which the government prevailed include Standard Oil, n3 American Tobacco, n4 Alcoa, n5 Paramount, n6 United Shoe Machinery, n7 and AT&T. n8 The prevailing conventional wisdom is that in most of these cases the remedies were at least partially successful in restoring competition to an industry that had been illegally monopolized by the defendant(s). However, there is a surprising lack of evidence to support such a view, in part because scholars have not attempted to undertake counterfactual analyses of the relevant industries.

Given the passage of time and the dearth of data regarding cases that were litigated fifty to ninety years ago, this review cannot always provide dispositive conclusions. However, in most

cases there is sufficient evidence to question whether the government's victory and the structural relief it obtained had a beneficial effect on competition and economic welfare. Because the resources expended by the government and defendants on lengthy litigation and on the ensuing structural relief are substantial, requiring the expenditure of real resources and the short-run [*111] opportunity cost of lost output, the long-run gains from restructuring must be substantial. But in most cases the available evidence does not allow the conclusion that the court-imposed relief had its intended effect.

A. Identifying "Monopolization"

An essential part of any section 2 Sherman Act case is identifying monopoly power and its sources. Under case law, monopoly power is the power to exclude competitors and to raise prices in a particular market. Determining whether a firm or set of firms has such monopoly power requires drawing inferences from data on market concentration, ease of entry, price-cost margins, and rates of return on capital. Even if a firm appears to possess monopoly power by any or all of these measures, however, it may not be guilty of "monopolizing." Monopoly power may have evolved naturally because of economies of scale or scope or because of patents or other intellectual capital. In such cases, the government will find it difficult to prove monopolization.

To prove monopolization, the government must demonstrate that a firm has not only power over price and output in an antitrust market, but also that this power was obtained by business decisions whose intent was to exclude competition. n9 It is not sufficient to demonstrate, in Judge Learned Hand's words, that the defendant obtained a monopoly position if it did so through "superior skill, foresight and industry." n10 The government also must prove that the defendant did not achieve this status simply by being progressive and efficient, but that it undertook specific actions designed to exclude competition. The mens rea of intent must be merged with the actus reus of monopoly power for a company to be found guilty of monopolizing.

To prove monopolization thus requires an analysis of how the defendant achieved its position of monopoly. This analysis begins with the definition of the market, because monopoly power does not exist if the firm controls only one of many substitute products and therefore cannot exercise power over price. Having defined the market and established the defendant's monopoly power, the government must then demonstrate how the defendant obtained its alleged monopoly position. Anecdotal evidence on the causes of rivals' failures will often suggest that [*112] predation was involved, but such evidence may not withstand scrutiny. The defendant may have been innovative in developing product attributes, distribution channels, marketing strategies, or backward integration into the supply of requisite inputs. If such strategies allowed it to price its products or services below those of its rivals or to otherwise offer a more attractive package to its customers, such a strategy could hardly be considered predatory. Nevertheless, the government may argue successfully that the practices are exclusionary. If so, the government may seek relief that limits the "bundling" of attractive features or that requires vertical divestiture. n11

B. Remedies in Antitrust Cases

If the government has advanced an incorrect theory of the determinants of the defendant's success in achieving a monopoly position, its recommendations for a decree that purports to increase competition are likely to prove either ineffective or counterproductive. For instance, as discussed

below, the dissolution of the Standard Oil Trust in 1911 had no discernible effect on output and prices in the petroleum industry after 1911 because Standard's position in the rapidly growing petroleum industry of the early 1900s was already eroding due to the success of entrants in the booming oil patches outside Standard's stronghold in Pennsylvania and Ohio. Establishing thirty-eight separate, independent companies by dissolving the Trust had little impact on the ability of new, independent companies to expand their operations in Oklahoma, Texas, or California. The alleged sins visited on Standard's early competitors in Pennsylvania or Ohio had nothing to do with the state of competition in Missouri, Kansas, Oklahoma, Texas, or California a decade or so later.

By establishing an inefficient market structure, an antitrust decree may be even counterproductive. For example, it has been argued that the decree ordering vertical dissolution in the Paramount case broke the essential bond between production, distribution, and exhibition that was required for efficient production and distribution of motion pictures.ⁿ¹² If this is true, the decree reduced consumer welfare until vertical integration was reestablished by distributor downstream integration into cable television [*113] thirty years later or into Internet delivery more than forty years later. Whether it was counterproductive or not, as shown below, the decree had no discernible effect on output and may even have increased consumer prices.

A decree may also be ineffective because the government and the court fail to anticipate changes in technology or customer demand. In 1969, the government filed a section 2 case against IBM for allegedly monopolizing the computer industry.ⁿ¹³ The case was eventually dropped in 1982 when the Assistant Attorney General for Antitrust discovered that the industry had changed drastically in the 1969-1982 period and that IBM was not selling any products in 1982 that it had offered in 1969. Any theory that purportedly explained IBM's dominance of the market for 360 or 370 mainframe computers was not likely to provide a useful guide to establishing competition in an era in which IBM was struggling to compete with Apple in the market for the newest generation of personal computers.ⁿ¹⁴ Surely, this should be a warning to those who advocate a structural decree in the current Microsoft case, given that Microsoft's products have been evolving even more rapidly than were IBM's products in the 1970s.

These problems are particularly acute in markets that for decades have been regulated by the government as monopolies. For example, the Federal Communications Commission (FCC) began to admit entrants into interstate telecommunications in 1969. By the mid 1970s, the FCC had lost control of this liberalization process and actually attempted to block the entry of MCI into ordinary long-distance services. When rebuffed by the courts, the FCC was forced to regulate intercarrier connections to facilitate competition. Not surprisingly, it failed in this attempt, and the new major entrant, MCI, struggled to take market share from the erstwhile regulated monopolist, AT&T. MCI and others eventually persuaded the government to bring a section 2 Sherman Act suit against AT&T,ⁿ¹⁵ but a codefendant in this suit should have been the FCC. As demonstrated below, the FCC could have achieved at least as good a result as that of the eventual court-ordered dissolution of AT&T and without its costly disruption.

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C. Structural Versus Behavioral Relief

Remedies in section 2 cases generally take one or both of two forms: structural remedies or behavioral relief. Structural remedies are those in which the court orders some change in the firm's

or industry's structure. These changes may involve a horizontal divestiture or "breakup" through which two or more separate companies are created from the assets of the defendant. For example, the court-ordered dissolution of the Standard Oil trust created several quasi-independent refining companies by simply requiring that the various companies in the Trust be spun off to Standard's stockholders. Alternatively, the relief may require vertical divestiture, the creation of separate companies at different stages of production. The Paramount case resulted in five decrees that divested the major film distributors' theater chains from their production-distribution operations.

Behavioral relief generally proscribes some aspect of the firm's behavior that the government identified during the litigation as anti-competitive, such as tying arrangements, "block booking" of feature films, price "squeezes" on downstream competitors, collusive agreements to exclude competitors, leasing equipment without an option for purchase, or predatory pricing. Such prohibitions obviously require monitoring by an enforcement authority and are likely to result in numerous issues that have to be resolved by the courts.

Finally, relief may involve the compulsory licensing of intellectual property that is the source of the alleged monopoly power. There have been a large number of such decrees, involving such diverse products as copying machines, motion picture film, glass, and oil well equipment. n16

The ongoing costs of enforcing antitrust decrees can be very large. If an industry is changing rapidly, structural remedies may be difficult to enforce. For instance, it may be difficult to determine the demarcation point between various stages of production that have been separated through vertical divestiture. When television exhibition replaced theatrical exhibition of feature films, for example, would the Paramount defendants be allowed to own television stations, but not theaters? Could the divested Bell operating companies provide Internet service through local [*115] Internet Service Providers (ISPs) if the latter sent data packets across "Local Access and Transport Area" (LATA) boundaries? What if the Bell-owned ISP connected with another entity within its own LATA, who, in turn, sent the data packets to the Internet backbone?

Most of the antitrust decrees in the leading cases analyzed below continued in effect for many years, even decades. In many cases, these decrees required continual supervision by the lower court and often led to appeals to the higher courts. The AT&T decree, in particular, was a structural decree that involved scores of hearings before the district court and created a backlog of unresolved disputes that had become very large by the time the decree was finally vacated by 1996 legislation. Approximately thirty-five to forty separate waiver requests were filed per year in the first eight years of the decree, and by 1993 the average age of pending waiver requests had grown to approximately four years. n17 This caseload was due in no small part to the changing nature of the telecommunications industry.

I

Structural Relief in Monopolization Cases

I have conducted an exhaustive review of the antitrust remedies that have been imposed as the result of government victories or consent decrees in cases brought by the government between 1890 and 1996 charging monopolization. The goal of this exercise is to determine the frequency with which structural remedies were imposed in all monopolization cases, and the types of cases in which such relief was imposed.

To construct the database of monopolization cases, I assembled all the relevant cases from the CCH Abstracts from 1890 to 1996. Of the more than 4,000 entries, I found 423 cases for which sufficient information was available and that met the initial criteria - a consent decree or a finding against the defendants in a monopolization case brought by the government. n18

Of the 423 monopolization cases, eighty-seven were criminal [*116] cases and 336 were civil cases. All eighty-seven criminal cases resulted in monetary fines. Of the remedies that resulted from the 336 civil cases in the database, 172 were behavioral remedies (51.2%), sixty-nine involved compulsory licensing (20.5%), and ninety-five were structural remedies (28.3%) (see Table 1).

Table 1
Monopolization Cases That Resulted in Structural Remedies

[SEE TABLE IN ORIGINAL] [*117]

[SEE TABLE IN ORIGINAL] [*118]

[SEE TABLE IN ORIGINAL] [*119]

[SEE TABLE IN ORIGINAL] [*120]

Of the ninety-five cases shown in Table 1, sixty-three resulted in a divestiture or dissolution and thirty-two in restrictions on business activities. In the latter cases, for example, a firm or firms might be barred from offering certain goods or services or be required to sell as well as lease their products. I distinguish these prohibitions from outright divestiture or dissolution, which requires the separation of a firm's assets, the sale of certain divisions, and the dissolution of an entire organization, such as an association through which a price-fixing conspiracy had been effected. For example, the line-of-business restrictions imposed on the Bell Operating Companies in the 1982 AT&T decree would be classified as a structural remedy in my classification, not as a behavioral remedy. If these restrictions required the sale or spin-off of assets, as the AT&T decree surely did, it would be defined as a "divestiture."

For each of the cases listed in Table 1, I created three separate subcategories, reflecting the activities that led to the firm(s) being charged with monopolization. The subcategories are (1) cases in which mergers and acquisitions were central to the government's case, (2) cases involving coordinated price behavior among defendants, and (3) cases in which neither mergers and acquisitions nor coordinated price behavior were central elements in the case (single-firm cases). Note that a very large [*121] share of the cases that resulted in divestiture involved either price coordination (i.e., price-fixing or market-sharing conspiracies) or mergers and acquisitions that led to monopoly power.

Dividing the cases that resulted in structural relief into these categories is important because the problems in effecting such relief are likely to be very different across the three categories. First, divestiture or dissolution in cases involving price coordination is generally quite simple because dissolution of a trade association or other organization that exists principally to carry out a price-fixing or market-sharing conspiracy is straightforward and does not necessarily imperil the viability or efficiency of the independent firms that were found to have been involved in the market coordination. Similarly, divestiture of recently-merged entities is much more easily accomplished than is the breakup of a unitary firm that is not a combination of recently independent companies. However, divestiture of a single organic firm can be much more difficult and risky in terms of lost

output or producer efficiency. Courts are understandably reluctant to order relief that may not be sustainable in the marketplace.

For example, Judge Wyzanski resisted a divestiture decree in United Shoe Machinery because of the difficulty in dividing up a company with only one plant. n19 Similarly, in the 1911 Standard Oil case, the court left intact the various Standard companies that comprised the Trust, fearing the effects of a more drastic divestiture. n20

Of the sixty-three cases in which divestiture or dissolution was imposed, seventeen were cases involving mergers and acquisition(s), forty-three were cases resulting from coordinated price behavior, and only three were single-firm divestitures in which neither conspiracy nor acquisitions were involved. Another three cases in the coordination category, the three network television cases brought in the 1970s, resulted in less drastic structural relief, namely, limitations on business activities. Table 2 lists the monopolization or tying cases that did not allege coordinated price behavior or mergers and acquisitions, but resulted in divestiture or dissolution.

To summarize, of the ninety-five monopolization cases that resulted [*122] in structural relief, only three (3.2%) led to divestiture or dissolution when a single firm was charged with monopolization without resort to mergers and acquisitions or coordinated pricing behavior with other firms. I include United Shoe Machinery in this list in Table 2 because it was eventually required to spin off some assets fifteen years after the trial judge refused to order such relief and because mergers and acquisitions were not a major source of United's market position. In another of the "landmark" monopolization cases in which the government prevailed, Alcoa (filed in 1937), a single-firm monopoly was not broken up despite having been found in violation of section 2 of the Sherman Act because the trial judge held that sale of government-owned assets would provide sufficient structural "relief." n21

[SEE TABLE IN ORIGINAL]

Table 2

Monopolization or Tying Cases Involving Firms Not Involved in Conspiracies or Acquisitions That Resulted in Divestiture or Dissolution

II

The Leading Cases

In this section, I review of many of the landmark section 2 cases, with a particular focus on the apparent effects of the resulting decree on prices and output in the relevant industry. The essence of monopoly power is the ability to raise price through the control of output and entry. Therefore, for a section 2 decree to have a beneficial effect, at a minimum, it should lead to greater output and lower prices. In addition, entry or the increased threat of entry should increase innovation after some period of time. Where possible, I provide some evidence of [*123] changes in market shares, the profitability of the defendant(s) before and after the decree, and the returns to stockholders. These various measures are used to develop at least a tentative conclusion of the success or failure of the relief that was built into the decree. n22

A. Standard Oil

The Standard Oil Company was formed in Ohio in 1870 by John D. Rockefeller and associates. n23 In its earliest years, the company refined and marketed crude oil produced in Pennsylvania, Ohio, and Indiana. Over time, however, it expanded to a large number of surrounding states and developed transportation and production facilities for processing crude oil from a number of states. From its beginning, Standard Oil was controversial because of its aggressive competitive conduct, particularly in negotiating contracts for transporting its oil on eastern railroads and its alleged use of predatory pricing. As a result, it was the subject of numerous state and federal actions against these practices, culminating in a Sherman Act suit in 1906. n24 Standard Oil was broken up in 1911 as the result of a government victory in this case.

1. Oil Production

Crude oil was discovered in Pennsylvania in 1859. Production rose steadily in Pennsylvania and then on the Ohio-Indiana border in the 1870s, but it was not until oil was discovered in Kansas, Oklahoma, California, and Texas that oil production began to expand rapidly. In 1899, production in the Mid-Continent (Kansas-Oklahoma), Gulf (Texas-Louisiana), and California fields accounted for just 7% of total U.S. output. n25 The oil boom in Texas, Kansas, California, and Oklahoma began in earnest in [*124] 1901-1902, and by 1909 these areas accounted for nearly two-thirds of U.S. crude production. n26 As Figure A-1 shows, crude oil production grew slowly for seventeen years after 1883, but began to accelerate in 1901-1910 due to the exploitation of these western fields. Surprisingly, production growth slowed somewhat from 1910 until 1919 despite the acceleration in Gross National Product (GNP) due to World War I. n27

The rapid growth in oil output in the 1900-10 period is clearly attributable to a dramatic shift in supply, not simply to the effect of the introduction of the automobile. Only 190,000 motor vehicles were registered in the United States as late as 1910, and gasoline production accounted for less than twenty-five percent of the domestic shipments of refined petroleum products even as late as 1914. n28

Throughout this period, most U.S. refined oil was used as lubricants, as fuel oil to power industry and heat commercial and residential buildings, and as illuminating oil. As demonstrated below, while the prices of these refined products fell in the first decade of the twentieth century, the price of gasoline did not because of technological constraints on gasoline production.

Figure A-1

U.S. Oil Production v. Real GNP, 1870-1925

[SEE FIGURE IN ORIGINAL]

2. Industry Structure

In its formative years, Standard Oil purchased crude oil from Pennsylvania and Indiana-Ohio producers and arranged for transportation to its refineries. Over time, an increasingly large share of this transportation was effected through Standard's own pipelines, which it used to control output in the early years of the industry. n29 When the Mid-Continent and Gulf fields opened, however, Standard was unable to achieve a similar dominant position through controlling crude-oil pipelines because the large scale of these fields and the proximity of the Gulf fields to water-borne transportation provided the opportunity for competitors to construct their own pipelines. As a result,

Standard companies were unable to obtain and retain a large share of production in [*125] these areas. Gulf Oil, the Texas Company, Sun Oil, and a host of independents prospered, obtaining a large share of the production from these fields throughout the 1901-1910 period. n30

The refining of crude oil into final products evolved over time due to changing product demand and improvements in technology. The share of gasoline in total output rose steadily in the early twentieth century as the stock of motor vehicles increased. The development of new technologies, such as cracking, was required to increase the yield of gasoline and other volatile compounds.

Refined products were distributed through the integrated refiners' bulk stations and by independent jobbers. The Standard companies and their large competitors, Union Oil, the Texas Company, Pure Oil, Cudahy, and Gulf Oil, built terminals to provide the wholesale distribution of fuel oil, kerosene, gasoline, and lubricating oils. However, the shift away from kerosene towards fuel oil and gasoline required major new investments in distribution facilities, opening the door for Standard's competitors in the twelve years leading up to the 1911 dissolution. In 1899, Standard's [*126] competitors accounted for only about fifteen percent of the domestic market for all refined products. By 1911, they supplied nearly seventy percent of the country's fuel oil, thirty-four percent of the gasoline, and one-quarter of the nation's kerosene. n31 For the most part, these products were sold by the integrated (i.e., refiner-owned) and independent wholesalers to an independent retail sector and directly to large industrial users.

3. Oil Prices

Crude oil prices fell sharply in real terms during the formative years of Standard Oil and continued their decline until 1892. n32 For the rest of the 1890s, the real price of crude rose as production growth slowed. However, from 1900 until 1911, real prices fell once again in response to the sharp increase in production from the newly developed Mid-Continent, Gulf, and California fields (see Figure A-2). During this period, Standard Oil was scrambling to build new refineries to compete with companies such as Sun Oil, Gulf Oil, and the Texas Company. As it expanded its refinery output and distribution, it would reduce prices selectively to compete with the non-Standard Oil companies. In response, Standard's competitors - including the smaller local refineries - pressed a number of states to pass "anti-discrimination" laws preventing any company from reducing its prices in one part of the state without reducing them everywhere.

Perhaps as a result of these anti-discrimination laws, the price of refined products - as measured by the Wholesale Price Index (WPI) for "Fuel & Lighting" - did not decline with the sharp decline in crude-oil prices between 1900 and 1910 (see Figure A-2). The widening gap between crude prices and refined products prices was an issue in a series of legal actions against the Standard Oil Trust that culminated in the Sherman Act case that was brought in 1906. One of the reasons for this gap, however, was the shift towards gasoline at a time when gasoline refinery output was constrained by technology.

Figure A-2
Real U.S. Oil Prices, 1870-1925

[SEE FIGURE IN ORIGINAL]

The spread between gasoline and kerosene prices widened from 3.9 cents in 1909 to a peak of seventeen cents in 1917. During this period, the price of kerosene was relatively stable, declining

from 9.5 cents per gallon to six cents per gallon between 1909 and 1911, then returning to nine cents per gallon for virtually all [*127] of the 1913-17 period. By contrast, gasoline prices nearly doubled between 1909 and 1917, rising from 13.4 cents per gallon to twenty-six cents per gallon. n33 During this period, the domestic demand for gasoline was increasing rapidly due to the increase in motor vehicle use, but the demand for kerosene - used largely for illumination - was rising much more modestly. With constraints on the proportion of refined output that could be produced as gasoline, this increase in gasoline demand relative to the demand for other products placed upward pressure on gasoline prices relative to the prices of other refined products, such as kerosene. In addition, the onset of World War I led to a sharp increase in gasoline exports while kerosene exports declined. As a result, the spread between real gasoline prices rose dramatically in the 1914-1917 period (see Figure A-3).

Figure A-3
Real Petroleum Prices, 1899-1925

[SEE FIGURE IN ORIGINAL] [*128]

4. The Antitrust Case and Its Antecedents

Complaints about Standard Oil's business practices took a number of forms. n34 First, it was alleged that Standard Oil used ruthless practices in negotiating transportation contracts with railroads through its South Improvement Company, and later, in denying independents access to its pipelines. n35 Second, Standard Oil was alleged to have used selective predatory price cuts to drive rivals from the market. n36 Third, public authorities and the [*129] public in general feared that Standard Oil's secretive organization - the Standard Oil "Trust" - gave it unspecified market power. Finally, it was alleged that Standard Oil used its trust form of organization to effect a price-fixing conspiracy, complete with profit "pools." n37

The trial court ruled that Standard had violated sections 1 and 2 of the Sherman Act by engaging in a massive restraint of trade through the Standard Oil Trust and monopolizing interstate commerce in petroleum products. n38 The decision was handed down in St. Louis on November 20, 1909 and was upheld in a landmark Supreme Court decision on May 15, 1911 with Justice White writing the opinion. n39 At the time of the trial, the Standard companies controlled 72% of Appalachian crude oil supplies, 95% of the Ohio-Indiana supply, and 100% of the Illinois supply. However, they only controlled between 10-45% of the Mid-Continent, 10% of Gulf Coast, and 29% of California supplies. These supplies collectively accounted for two-thirds of U.S. supply by the time Chief Justice White penned his opinion. In the first twelve years of the twentieth century, Standard's share of refinery capacity fell from 82% to 64% of U.S. capacity. n40

Standard's shares of the refined products market, while substantial, were also in decline before the antitrust case was finally decided. Its share of the kerosene market had fallen from 85% to 75% from 1899 to 1906-1911, but kerosene demand was growing very slowly. In the more rapidly growing fuel-oil and gasoline markets, Standard's average shares were lower and also falling. By 1906-1911, its share of fuel oil sales had declined to just 31% from a level of 85% in 1899. In gasoline, Standard accounted for 66% of sales in 1906-1911, down from 85% in 1899. n41

The trial court and the Supreme Court found that Standard's aggressive behavior in transporting oil and pricing refined products constituted sufficient evidence of a willful strategy to monopolize

the country's petroleum industry. n42 In addition, they found the manner in which Standard reconstituted its Trust in [*130] New Jersey, after an Ohio court had invalidated the earlier Ohio trust, to be particularly offensive. n43 Clearly, the federal circuit court and the Supreme Court saw the New Jersey Trust as a set of potentially competing companies that had been brought together to form a combination in restraint of trade.

The decree issued to provide relief from Standard's violation of the Sherman Act was rather basic in design. It simply required that the New Jersey Trust be dissolved and that the stock in each constituent company be spun off to Standard's stockholders. n44 As a result, thirty-eight separate companies were established as independent entities, albeit with common ownership. However, the Supreme Court explicitly mandated that no single entity was to control these companies henceforth. n45 The company complained that the dissolution created a set of uneconomic companies, many of which had insufficient upstream or downstream integration to compete successfully, and that the pipeline companies would be deprived of the essential network economies for which they were mutually designed. The Court rejected Standard's complaints. n46

5. The Effect of the Dissolution

As discussed above, the Standard companies were already losing market share before the Trust's dissolution in 1911. Indeed, two prominent students of the industry remarked that:

Even more important than the dissolution of the Standard Oil Trust in altering the aspect of the industry after 1911 was the violent transformation and expansion in demand, with skyrocketing sales of automobiles, and the corresponding vast increase in supply, marked by alternating periods of threatening shortage and dramatic new discoveries. n47

Had the market grown more slowly and oil production been limited to Appalachia and the Midwest, Standard might have held on to its dominant position. But the enormous discoveries of oil in Oklahoma, Texas, and California and the rapid shift to gasoline from other refined products after 1910 would have made [*131] it difficult for the Standard Trust to maintain its position even without the court-mandated dissolution.

To estimate the effect of the dissolution on the output and price of crude-oil in the United States, I estimated two reduced-form regression equations in which the exogenous variables are real GNP, total U.S. automobile registrations, total U.S. electricity production, two time trends for the period prior to 1901 and the period thereafter, and a dummy variable equal to zero prior to 1912 and one thereafter to capture any effects of the decree. n48 These variables capture the effects of aggregate demand and other influences on the demand for petroleum, as well as the supply shift that occurred just after the turn of the century due to the opening up of the new western fields. The period of estimation is 1889-1917, a period that includes the era before the antitrust case and six years after the decree. Table A-1 exhibits the results for both the entire period and for 1900-1917, a shorter period for which data on all variables are available. n49

Table A-1

The Determinants of U.S. Crude-Oil Production and Price, 1889-1917
(t-statistics in parentheses)

[SEE TABLE IN ORIGINAL]

These results generally confirm the effect of new discoveries after 1900, but do not suggest any influence of automobile registrations in the period through 1917. The coefficients for the dummy variable for the period following the dissolution of Standard Oil are not statistically significant, particularly in the price equations. The oil production estimates suggest a perverse effect of the decree - the coefficient for the 1912+ dummy variable is marginally significant and negative in the total production equation, suggesting that output fell after the dissolution. n50 Thus, the most conservative interpretation of these results is that the dissolution had, at best, no effect.

Indeed, it appears that the stock market had discounted these [*132] possibilities in advance. Despite the apparently drastic remedy of total dissolution of the company, the price of the equities of Standard Oil of New Jersey and its successor companies rebounded in 1911 after the Supreme Court decision and soared in 1912. n51 Professor Malcolm R. Burns of the University of Kansas has found that this rebound was greater than the decline in the value of Standard's stock in 1906 when the government's complaint was announced. n52 Burns suggests that this was the result of the market's recognition of the "benign" nature of the decree. n53 An alternative explanation is that the decree could not reduce Standard's market power in the growing geographical markets where it had none.

I have confirmed Burns' basic results using monthly data on the returns to holding Standard Oil (of New Jersey) common stock and on the Dow Jones Average rather than the Cowles Index for stock prices in the standard Capital Asset Pricing Model. n54 The announcement of the antitrust suit initially depressed [*133] Standard's equity price - i.e., created a negative excess return of 10.9%, but the stock recovered somewhat in the ensuing months. Five months after the announcement of the suit, the cumulative negative excess return had been reduced to 5.8% (see Table A-2). In the month in which the trial court's decision was announced, November 1909, Standard shareholders once again suffered a negative excess return of 3.8%, but this entire loss was recovered during the next five months. Finally, the Supreme Court's May 1911 decision reduced shareholder excess returns by about four percent through August 1911, the last month in which the old Standard company remained intact. If one uses a six-month "window" after each of these three events (except for the Supreme Court decision) to assess the stock market's reaction to antitrust developments, the overall effect on shareholders is only an eight percent negative excess return. Over the entire period from November 1906 to the end of the old Standard Oil in August 1911, however, the cumulative excess returns from the Capital Asset Pricing Model n55 are very large and positive. Overall, these results confirm that investors did not expect the adverse antitrust ruling to have negative repercussions for Standard Oil shareholders.

Table A-2

The Excess Returns to Stockholders of Standard Oil (N.J.) During Major Antitrust Events, 1906-1911

[SEE TABLE IN ORIGINAL]

The decree established ten separate refining companies, but [*134] these companies were separated by substantial distances and were unlikely to begin competing against each other very soon after the decree. All were simply set free with the assets that they had at the time. For instance, some, such as Standard of California and Standard of New Jersey, had extensive pipeline and marketing facilities. Others, such as Standard of Kansas, had none. Ohio Oil and Prairie Oil and Gas

were crude oil producers with pipelines, but South Penn Oil was left as a crude oil producer without pipelines. n56 In short, the post-dissolution structure of the industry was largely an accident of Standard's pre-1911 corporate organization.

The erstwhile Standard companies' share of refined products output continued to fall after the decree, but the decline was simply an extension of the 1899-1911 trend (see Table A-3).

Table A-3
Standard's Share of Refined Output, 1899-1920 (percent)

[SEE TABLE IN ORIGINAL]

Indeed, the rate of decline in the Standard companies' share of refined output, as measured by capacity of crude oil consumed, only increased from -2.0% per year to -2.7% per year after 1911. n57 Of course, the Standard companies were independent in theory after the 1911 dissolution - an independence constrained for a time by common stock ownership.

Because the Standard companies were the major purchasers of crude oil, if the dissolution had damaged their alleged monopoly - and monopsony - position, one might have expected crude-oil prices to rise sharply after 1911. But as Figure A-2 shows, real [*135] crude oil prices rose only slightly between 1911 and 1913, and then fell for two years. Thereafter, spurred by strong demand during World War I, they rose sharply and then receded to 1911 levels by 1923. Moreover, oil production actually grew more rapidly in the decade prior to the 1911 decree than in the decade that followed (Figure A-1).

Given the enormous changes that were occurring in crude-oil fields in the Mid-Continent, Gulf, and western regions during this period, it would be difficult to ascribe any of these price movements in crude oil to the antitrust decree. Indeed, as shown above, Standard companies controlled less than one-third of the total output from these three new oil-producing regions when the decree was entered, and their share of crude oil purchases in these regions had been falling. The regions in which the Standard companies continued to be dominant accounted for just 12.7% of oil production by 1919. It is difficult to see how separating the various Standard pipeline or refining-pipeline companies from each other would have materially increased competition for crude in the newer oil-producing regions if there was already aggressive competition from large, well-capitalized independents such as Gulf Oil, Union Oil, the Texas Company, Sun Oil, Phillips, and Cities Service. n58 Likewise, new entrants after 1911, such as Shell and the Santa Fe Railroad, most likely would not have been dissuaded from such entry if the antitrust suit had not been decided against Standard Oil.

Nor is there evidence that the dissolution of the Standard Oil Trust had any effect on refined product prices. Figure A-3 shows that real kerosene prices rose slightly after the decree - particularly during the first few years of World War I - but then receded to their 1911-1912 levels. Gasoline prices, on the other hand, had been declining slightly prior to 1911, but then soared with rising domestic and export demand during World War I. Technological change in refining processes eventually lessened the difference [*136] between kerosene and gasoline prices, but the gap remained above its 1911 level until the 1920s.

6. Concluding Assessment

The oil industry was becoming much more competitive throughout the first few years of the twentieth century - as the Standard Oil case was being litigated - in large part because new entrants in the Midwest, Gulf Coast, and California were successful in obtaining a large share of refinery output and sales. Standard may have engaged successfully in exclusionary tactics in the East in the industry's early years, but it was not successful in extending these practices westward. There is simply no evidence that the Standard Oil decree, which created thirty-eight quasi-independent companies by dissolving the Standard Oil Trust, had a significant effect on output or prices in the U.S. oil industry.

Whatever the merits of the government's case for the pre-1900 industry, it appears that the case had already been rendered moot by competitive developments in the early 1900s. As with the IBM case, brought more than sixty years later, the Standard Oil litigation involved allegations of monopoly abuses whose effects were surely being overtaken by rapidly changing market conditions. The decree might have worked to restore competition prior to 1900, but by 1911 the oil industry was very different and the decree was not needed.

B. American Tobacco

Like Standard Oil, the American Tobacco Company was organized as a trust. It was first incorporated in 1890, and by 1909 the Trust had grown to include eighty-six different companies conducting business in the United States, Cuba, and Puerto Rico and thirty-three others operating in other parts of the world. n59

1. Market Position

The company assumed a dominant position in the production of all U.S. tobacco products other than cigars, accounting for between 76% and 96% of the output of such products as plug tobacco, smoking tobacco, snuff, and cigarettes in 1910 (see Table B-1).

Table B-1

American Tobacco's Share of U.S. Output, 1910 (percent)

[SEE TABLE IN ORIGINAL]

[*137] This market position was obtained through acquisitions of firms such as the Union Tobacco Company and the Continental Tobacco Company and through extremely aggressive pricing behavior, allegedly including sales at prices below manufacturing costs. n60

Between 1890 and 1910, U.S. cigarette production increased fourfold, from approximately 2.5 billion to ten billion cigarettes. Although it lost market share to new "Turkish" cigarette brands in the early 1900s, the American Tobacco Trust's share of domestic output recovered to approximately 85% by 1910. Throughout this period, its overall rate of return on tangible assets varied substantially, declining from about 54% in 1890 to only 16% in 1899, but rising thereafter to more than 35% in 1903. n61

2. The Antitrust Suit

The American Tobacco Trust was challenged in numerous state antitrust actions in the 1890s, but the Trust generally prevailed in these actions. The 1904 Northern Securities n62 decision forced a reorganization of the Tobacco Trust, but it was not until 1908 that the government, seeking to dissolve the Trust entirely, filed its major Sherman Act case against the tobacco producers. This case was decided in the government's favor, and American Tobacco was barred by an injunction from continuing to operate in interstate commerce until the conditions that existed prior to [*138] the formation of the Trust were restored. n63 The Supreme Court found this remedy too drastic, ordering instead that the trial court hold hearings to determine a "plan or method of dissolving the combination." n64

The trial court subsequently approved a dissolution of the Trust that divided cigarette production into three separate parts. n65 American kept assets that accounted for approximately thirty-seven percent of cigarette production, P. Lorillard had 15%, and a new company, Liggett and Myers, was provided with the assets to produce brands that accounted for 28% of cigarette output. n66 The court similarly divided assets devoted to plug, smoking tobacco, and cigars. Finally, the court also declared invalid various restrictive covenants provided by firms and individuals that had sold out to the Trust. n67

While individual stockholders' control of the voting rights in the new companies was reduced somewhat, the large stockholders continued to hold important positions in all three of the major companies that emerged from the decree. This continued ownership by the Trusts' former owners was very controversial at the time of dissolution, as was the three-firm oligopoly structure that the decree established. The trial court rejected any objections based on these concerns, asserting that it was a court of law, not a commerce commission. n68

3. The Effect of the Decree

The dissolution of the American Tobacco Trust occurred very quickly. The court's decree was entered in November 1911, and the changes were to be effected by February 1912. The immediate practical effect of this restructuring of the tobacco industry was to unleash a battle for market share, carried out largely through advertising. n69 The three-firm oligopoly did not engage in vigorous price competition. With the incredibly successful introduction of the Camel brand, Reynolds became the industry's price leader.

[*139] Cigarette prices were essentially stable during the 1909-1913 period (see Table B-2). The average real price of the "domestic and blended brands" that accounted for the overwhelming share of sales fell between 1909 and 1910 but then rose after the imposition of the decree. n70 The real price of the "Turkish" brands fell between 1909 and 1910 and continued to fall, albeit at a somewhat reduced rate, after the decree. Thus, one cannot legitimately conclude that the immediate effects of divestiture were to reduce cigarette prices to consumers. Thereafter, cigarette prices became somewhat more volatile as Reynolds introduced and began promoting Camel (see Figure B-1). Wholesale prices rose much more rapidly during the 1917-1920 period in response to increases in tobacco excise taxes. n71 Throughout this period, the industry avoided price competition and the price wars that had accompanied the ascendancy of the American Tobacco Trust.

Table B-2
Cigarette Prices, 1909-1913 (\$ /1000)

[SEE TABLE IN ORIGINAL]

Had prices fallen after the decree, one would have expected the value of the industry's output to fall relative to GNP because cigarette demand is price inelastic. But the share of cigar, cigarettes, and tobacco fell only slightly - from 1.29% in 1911 of GNP to 1.20% in 1912 and then fluctuated between 1.04% and 1.30% for the next eight years. n72 The higher advertising expenses eroded cigarette producer profits per cigarette sold in the early post-decree period. However, the return on assets remained high throughout the next fifteen years. Absent price competition, the three-firm oligopoly was able to maintain its profitability despite the dissolution of the Trust. Indeed, operating profits [*140] averaged 17.5% on tangible net worth between 1912 and 1949 for the four major companies, about the same profit rate as that earned by the Trust in 1898-1908. n73

Nor is there evidence that the dissolution of American Tobacco affected the price paid to farmers for tobacco. The price of tobacco averaged 9.8 cents per pound in 1906-1910 and 10.3 cents in 1911-1915. n74 This 5% increase was less than the average consumer price inflation rate during the period. n75

Figure B-1

Net Real Price to Manufacturer (Dollars per 1000) Chesterfield and Camel Cigarettes

[SEE FIGURE IN ORIGINAL]

Given these results, it is hardly surprising that the returns to stockholders were largely unimpaired by the Trust's dissolution. The capital markets anticipated the rather sanguine impacts of the decree as the prices of American Tobacco stocks and bonds recovered in late 1911 and 1912 from their earlier declines that had resulted from the filing of the suit in 1907 and the Supreme Court's June 1911 decision. Using the Capital Asset Pricing [*141] Model, Burns finds that the excess returns that were generated by the announcement of the dissolution plan and the successor companies' subsequent declaration of dividends and interest essentially wiped out the negative excess returns caused by the adverse news from the suit's filing and the Supreme Court decision. n76

4. Conclusion

Although one might argue that the creation of a three-firm oligopoly to replace the old American Tobacco Trust had some beneficial effects on cigarette prices, the limited data available suggest that the decree had little effect on real cigarette prices in the first two years. In fact, immediately after the 1911 decree, real prices actually rose. The decree's principal effect appears to have been the development of oligopolistic rivalry that diverted substantial resources to advertising while having little effect on cigarette prices. Thus, it is difficult to conclude that the decree improved consumer welfare. The stability of the industry's profit rate and the absence of any decided break in prices after 1911 inevitably leads to the conclusion that this major section 2 case contributed very little to developing meaningful competition in the cigarette industry.

C. Alcoa

The manufacture of aluminum consists of four distinct phases: (1) the mining of aluminum ore, usually bauxite, (2) the refining of the aluminum ore to extract alumina (aluminum oxide), (3) the reduction of alumina into aluminum ingot, and (4) the fabrication of the ingot into mill products like

sheet, tube, and wire. Vertically integrated producers of primary aluminum generally produce their own alumina and refine it into aluminum. The fabrication process, however, has always consisted of a mix of independents and integrated producers.

1. Early History

The aluminum industry was born in the 1880s when America's Charles M. Hall and France's Paul L.T. Heroult separately developed patents for a cheap electrolytic process of reducing aluminum from alumina. Hall's patent application won over Heroult's [*142] in the United States due to Heroult's failure to file a "Preliminary Statement" with the U.S. Patent Office. n77 The Pittsburgh Reduction Company (PRC) was formed in 1888 to apply Hall's patent, and soon faced legal challenges from Alfred and Eugene Cowles, who also used Hall's process to make pure aluminum. The Cowles brothers had secured rights to a patent owned by Charles Bradley for internal heating of the electrolytic bath, which the PRC used in its aluminum production process. The PRC and the Cowles brothers sued and countersued each other for patent infringement, and separate decisions upheld the claims of both sides. n78 With neither party able to produce aluminum without the patent of the other, the PRC and Cowles brothers came to an agreement. PRC paid for a license to use the Bradley patent, and the Cowleses agreed not to reenter the aluminum production business.

This settlement allowed the PRC to extend its exclusive rights to aluminum production to 1909 (the Bradley patent had been granted three years after the Hall patent). When the patent expired in 1909, the economy had entered a recession, and entry into aluminum production proved difficult for would-be competitors. The PRC changed its name to Aluminum Company of America (Alcoa) in 1907, and by 1909 it had already integrated backwards into ore and electricity production and had begun "to roll sheet and fabricate sundry articles." n79

The aluminum market was very small until World War II. United States primary aluminum output peaked at 65,000 tons per year during World War I and did not exceed 200,000 tons until 1940. n80 By contrast, U.S. steel production peaked at fifty million tons in World War I and was only marginally higher in 1940, rising to sixty-seven million tons. n81 (see Figure C-1). The small aluminum market prior to World War II made entry very difficult because of economies of scale in alumina production. Through the 1930s, Alcoa produced its entire alumina output [*143] from a single plant in East St. Louis. Germany had but one alumina plant, the French three or four, and the British one. n82

Figure C-1

U.S. Production of Raw Steel and Primary Aluminum

[SEE FIGURE IN ORIGINAL]

In 1912, French interests formed the Southern Aluminum Company to construct a hydropower plant and a reduction plant in North Carolina, but the company could not complete the projects due to a lack of capital during World War I. In 1915, the plants were sold to Alcoa. Alcoa bought other facilities in the 1920s, including a Dutch mining operation in South America and power facilities of the Quebec Aluminum Company. In addition, Alcoa built considerable reduction capacity in Canada to go along with the Quebec Aluminum Company assets. Alcoa assigned these properties, along with its holdings in Europe, to Aluminum Limited (Limited). Limited was legally independent of Alcoa, but eleven stockholders who held half of Alcoa also held half of Limited.

Much of the Justice Department's early interest in competitive issues in aluminum centered on Alcoa's control of bauxite reserves and hydropower sites. However, it seems unlikely that entry would have occurred in a market that was so small. The failure of the French attempt prior to World War I is often [*144] ascribed to poor timing, but it may not have succeeded anyway given the economies of scale in alumina production and the small market size. In the Depression of the 1930s, aluminum output fell to less than 40,000 tons per year. If the East St. Louis alumina plant could supply Alcoa's smelters when output was 115,000 tons per year, its excess capacity in the 1930's would loom menacingly over any entrant's nascent operation. Moreover, Alcoa's rate of return on invested capital between World War I and 1935 hardly suggested that a bonanza awaited a successful entrant. Alcoa's average return over this period was just over 6% after taxes. n83

By the late 1930s, Alcoa's primary production and imports constituted 90% of the total American supply, with the rest imported by others. This did not include "secondary" aluminum, which was processed by independent smelters and competed with primary aluminum. The 90% share included aluminum fabricated by Alcoa as well as ingot sold in the market. n84

2. The Antitrust Cases

In 1912, the Department of Justice charged Alcoa with restraining trade and monopolizing the aluminum industry. n85 Alcoa signed a consent decree through which it gave up its interest in its Canadian subsidiary, dropped a contract with two chemical firms whose bauxite it had purchased, agreed not to enter any collusive agreements or mergers, and agreed not to discriminate against any competing fabricator in the sale of ingot. n86 Neither of the two chemical firms subsequently entered the aluminum business despite the advantages the consent decree gave them.

The Federal Trade Commission (FTC) subsequently brought two suits against Alcoa. The Cleveland Products Company had built a small rolling mill in 1915, but found it difficult to make money due to the wartime price ceiling for sheet. Alcoa agreed to infuse money into the plant in exchange for a controlling stock interest. The FTC challenged the stock purchase under section 7 of the Clayton Act and was sustained by the Third Circuit Court [*145] of Appeals. n87 Alcoa sold its interest to the other stockholder, but Cleveland Products encountered severe financial difficulties. When Alcoa bought the property at a sheriff's sale, the FTC again objected, but the circuit court overruled. n88 In any case, obsolescence soon closed the mill.

In 1924, the FTC reported that its investigations had disclosed violations of the 1912 consent decree. n89 The Department of Justice produced a rebuttal in 1926 that cleared Alcoa. n90 The FTC also charged Alcoa with delaying shipments of materials to competitors and with price discrimination, but dismissed the charges in 1930. n91

In 1937, three years after beginning an investigation of Alcoa, the Department of Justice filed a Sherman Act civil suit, charging Alcoa with monopolizing the aluminum market and restraining trade. District Judge Francis Caffey found Alcoa innocent of all charges, finding no evidence of a current attempt to monopolize. n92 He also rejected the government's argument that the power to fix prices and to exclude others from the market was monopolization. n93 The government appealed Judge Caffey's decision to the Supreme Court, but so many justices had to disqualify themselves because of their prior work in the Department of Justice against Alcoa that a quorum of six could not be achieved. n94 As a result, 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 such

cases. n95 Judge Learned Hand issued the decision of the Second Circuit Court of Appeals in *United States v. Aluminum Co. of America* in March 1945. n96 He sustained Judge Caffey's decisions on almost all of the charges, but ruled that the power to exclude and the power to fix prices constituted monopolization in violation of [*146] section 2 of the Sherman Act. n97 Alcoa was thus found guilty of monopolizing the market for primary aluminum.

The court's ruling on primary aluminum as the relevant product market generated substantial controversy. Secondary aluminum, produced from aluminum scrap, was excluded from the relevant product market because secondary aluminum could not be made without primary aluminum, whose production was controlled by Alcoa. Even though secondary aluminum would not enter the market for five to twenty-five years after its primary source was fabricated, Judge Hand concluded that a company would account for the effect of secondary products when pricing the primary product. n98

While Alcoa had argued that its profits on primary aluminum sales were not extravagant, Judge Hand ruled that the level of profits was irrelevant to the determination of monopolization or price fixing. n99 The court also found that Alcoa had created a price squeeze on downstream customers from 1925 to 1932 by selling some 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. n100 Judge Hand did not rest his opinion on this violation, but prohibited this practice in the future. n101 Judge Caffey did not provide a motive for the price squeeze, but it was likely motivated by a desire to engage in price discrimination without the fear of arbitrage. n102

3. Postponement of Relief

Judge Hand ruled that major remedies be postponed until after the war because of changes in the industry's structure created by the war emergency. n103 Due to the need for aluminum in the national defense effort when the United States entered World War II, the government had constructed plants for alumina reduction, [*147] aluminum smelting, and fabrication. n104 By 1944, the government plants accounted for approximately 50% of the domestic aluminum reduction capacity. The Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation (RFC), owned these government plants. Alcoa, Reynolds Metals Company, and Olin Corporation operated the government plants under management contracts. The Surplus Property Act, passed a year before Judge Hand's decision, directed that the sale of these plants be effected in a manner consistent with the development of competition. Therefore, although Alcoa had leases on several wartime plants that were effective through 1947 and 1948, the RFC canceled them on August 30, 1945. n105

Because there were only two government alumina plants, there could only be two new competitors to Alcoa in the primary aluminum market if the new firms were to be vertically integrated. Given that Alcoa remained vertically integrated, the Surplus Property Board (SPB) decided the new competitors, to compete on equal footing, should be as vertically integrated as Alcoa. The SPB approached over 200 metals companies as possible purchasers of the wartime plants, but only Reynolds Metals and Kaiser (then Permanente Metals Corporation) were willing to assume the large financial outlays required to become vertically integrated producers. With the exception of an extrusion plant and a smelter, which attracted no bidders and were thus granted to Alcoa, all of the government's wartime aluminum properties were assigned to Reynolds and Kaiser in 1946, 1947, and 1948. n106

From these government-owned assets, Reynolds received one of the two large alumina plants, two smelters, two sheet mills, two extrusion plants, and one forge shop. Kaiser received one of the two large alumina plants, two smelters, and one sheet mill. The government also induced Alcoa to allow the new competitors to use its alumina patents, free of royalties, conditioned on a "grant-back" to Alcoa of any improvement patents obtained by the competitors.

Interestingly, had Judge Hand ordered the vertical dissolution [*148] of Alcoa in 1945, the SPB might have been able to sell its aluminum production facilities to more than a maximum of two companies. n107 Whether a vertically fragmented industry structure would have survived or resulted in improved market performance cannot be known, although some economists criticized the court for preventing such a result. n108

4. The Final Decree

In 1947, Alcoa petitioned the court for a ruling that it no longer monopolized the market for primary aluminum. n109 After the government moved to dismiss the petition, the district court was directed to find if further remedies were needed. n110 Judge John Knox, who had taken over for Judge Caffey, presided over the trial and handed down his opinion in 1950. n111 He ruled against divestiture, but required that the court retain jurisdiction over the case for five years in case the new competitors were not able to provide sufficient competition. n112 In addition, Judge Knox ordered each of the eleven major Alcoa stockholders to sell their interest in either Alcoa or Limited within ten years. n113 The grant-back provision of the license agreements between Alcoa and the two new competitors was also eliminated, but Judge Hand's invocation against price squeezes remained. n114

In 1956, the Department of Justice argued that Reynolds and Kaiser had not proven an ability to compete and thus petitioned for another five-year test. District Judge Cashin ruled that the three companies' relative performance during the initial five-year period was sufficient evidence of competition and dismissed the government's petition. n115

5. The Effects of the Decree

The SPB's disposition of the government's aluminum properties created two viable competitors in Reynolds and Kaiser. Three additional companies entered the primary aluminum market [*149] between 1950 and 1955, once again with government assistance. In 1950, due to the onset of the Korean War, the government launched another program to expand aluminum capacity. The government issued each participating company an accelerated five-year amortization certificate for 85% of the new production cost and provided for government purchase at list prices of all the new plants' output that the producers could not sell commercially. The government also had the option to buy any aluminum from the new facilities at the list price. n116

Three new entrants into primary aluminum production were funded from this Korean War program: Harvey Aluminum Company, Anaconda Aluminum Company, and Ormet. In addition, the program funded capacity expansions by the three existing producers, Alcoa, Kaiser, and Reynolds. Harvey had not begun construction of reduction capacity from the third round of expansion when the expansion program ended in 1955 due to problems securing power supplies. These issues were resolved, and Harvey's 54,000-ton reduction capacity was in place in 1958. n117 The Anaconda plant began production in 1955. Anaconda received the accelerated amortization from the

government, but declined the government purchase contracts. This eliminated the requirement that Anaconda sell to independent fabricators or to the government.

The final successful entrant in the 1950s was Ormet, a joint venture between Olin Mathieson and Revere Copper and Brass. Olin had managed one of the government's plants during World War II, and Revere was an established aluminum fabricator. Both Olin and Revere had initially planned to produce primary aluminum individually. However, Olin experienced financing problems with respect to its second-round reduction capacity distribution, and the government had denied Revere an accelerated amortization certificate to build its own reduction plant. Thus, Olin and Revere formed Ormet, which constructed an aluminum reduction plant in 1958. Olin and Revere signed a twenty-five-year agreement to purchase at full manufacturing cost the ingot produced by Ormet. Olin would purchase 64% of the production while Revere would purchase the remainder. Each would sell the output in either ingot or fabricated form. Thus, the joint [*150] venture resulted in one additional primary aluminum producer, but two primary aluminum sellers. n118

By 1955, the new entrants had reduced Alcoa's primary aluminum market share to forty percent, but the market had grown substantially since the onset of World War II. In 1937, when the government first filed the Sherman Act suit, U.S. production of aluminum was only 146,000 tons. Although production slumped after World War II, demand during the Korean War drove aluminum production to more than 1.25 million tons, or nearly nine times its level when the antitrust case was filed (see Figure C-1). As a result, even though Alcoa's share had fallen to 40% by 1955, its output was more than four times its "monopoly" level in 1937.

The increase in the size of the aluminum market clearly facilitated entry, even without two government programs to build or finance new facilities. By 1955, Reynolds and Kaiser each had enough capacity to produce four times the U.S. output in 1937. By 1958, even Ormet had the capacity to produce the entire U.S. pre-World War II output (see Table C-1). With demand fluctuating between 34,000 and 102,000 metric tons in the 1930s, entry was not likely, with or without government assistance. Once output rose to more than 900,000 tons, the environment was quite different.

Table C-1
Installed Primary Aluminum Capacity in the United States

[SEE TABLE IN ORIGINAL]

The antitrust case and government-funded entry did not lead to lower aluminum prices (see Figure C-2). The price of aluminum ingot had fallen steeply during the Depression, and it continued [*151] to decline through World War II. After 1947, the price of primary aluminum stabilized, rising more rapidly than general inflation. A regression analysis of real aluminum prices over the period 1926-1950 confirms the conclusion that the antitrust case did not result in lower prices. This analysis includes a time trend for technical change in aluminum production, real GNP, the real price of hot-rolled steel bars (a substitute), the real price of electricity, the real price of imported bauxite, a dummy variable for the World War II years (1942-1945), and a dummy variable for the postwar years to reflect the effect of the government's structural "relief" - the increase in the number of primary aluminum sellers from one to three. n119 The results are shown in Table C-2 for 1926-1950 and for an extended period, 1926-1965. In general, the results show that the real price of aluminum is positively related to the cost of an important input, electricity, and to the price of a

substitute, steel. The trend rate of prices is negative in all four equations, but the time trend and real GNP are statistically significant only in the linear equations. There is no discernible impact of World War II on the real price of aluminum.

Table C-2
Regression Results for the Real Price of Primary Aluminum (t-statistics in parentheses)

[SEE TABLE IN ORIGINAL]

For our purposes, the important result that emerges from Table C-2 is that there is no discernible shift in real aluminum prices after the imposition of the decree in 1945. The coefficient of the post-1945 dummy variable is statistically insignificant in all equations.

Moreover, as Figure C-2 shows, the relationship between the wholesale price of aluminum extrusions to the price of primary aluminum did not change perceptibly between 1947 and 1960. (Earlier data on wholesale prices of aluminum products are unavailable.) Thus, it would appear that, for at least this one fabricated product, there was no change in the markup over primary aluminum and, therefore, no apparent effect of the decree on price "squeezes."

Figure C-2
Average Annual Real Price of Primary Aluminum and Producer Price Index for Aluminum Mill Shapes

[SEE TABLE IN ORIGINAL] [*152] The stock market reacted rather harshly to many of the various major events in the Alcoa monopolization case. First, when the case was brought in 1937, shareholders suffered a one-month excess loss of 11.5%, a loss that grew somewhat over the next five months to a cumulative 13.3% negative excess return (see Table C-3). When the trial court issued its findings of fact and conclusions of law in September-October 1941, stockholder excess returns were -1.2% in September but rebounded to a cumulative +4.6% at the end of the fifth month thereafter. The lower court's dismissal of the complaint in July 1942 was greeted favorably by the stock market, generating an excess return of 7.8% in July. However, the return declined to a cumulative -8.0% five months thereafter, suggesting the effect of another intervening event. Judge Hand's appellate court opinion in March 1945, reversing the lower court and finding that Alcoa had monopolized, generated negative returns of -0.3% in the first month, growing to a cumulative negative excess return of -3.4% five months later. Finally, Judge Knox's decision in June 1950 to deny the government structural relief resulted in a positive excess return of 6.8% in the first month, increasing to a cumulative 7.9% five months [*153] later. Overall, using a six-month window to gauge the effect of these five decisions, Alcoa stockholders appear to have lost about 12% relative to the overall market. However, using only the contemporaneous month, the excess returns were very slightly positive.

The last event shown in Table C-3, the final decision regarding Alcoa's forced stock disposition, resulted in very large negative returns for stockholders. Although this event, which occurred at about the same time as the government's Korean War subsidy program that resulted in the entry of Anaconda, Harvey, and Ormet, appears to have had a substantial effect on Alcoa shareholders, it is difficult to attribute this effect to any belief that competition might break out along the Canadian border.

Table C-3
Excess Returns to Alcoa Stockholders During Major Antitrust Events, 1937-1951

[SEE TABLE IN ORIGINAL]

6. Conclusion

The 1937 monopolization case brought against Alcoa reflected [*154] the failure of the earlier 1912 structural decree. The second Alcoa decree, finalized in 1950, was not very extensive due to the government's program to disperse war production facilities to new entrants. But in hindsight, it now seems likely that the failure of the 1912 decree to erode Alcoa's monopoly position derived from the small and even declining market for aluminum in the early and mid 1930s. When demand grew in the 1940s and 1950s, entry would probably have occurred even without government assistance. The government's decision to bring a section 2 case in the middle of the Depression, when demand likely would not have supported more than one supplier, must surely be questioned. Demand soared as the case was being litigated, and the federal government funded an expansion of capacity for the war effort. As in the case of Standard Oil, changes in the market rendered the monopolization case largely irrelevant. In the end, the antitrust suit served very little purpose other than to ignite controversy over the proper method for defining the relevant market and for determining the market-share threshold for establishing the existence of monopoly power.

D. Paramount

The motion-picture industry's early history is dominated by a series of patent disputes and antitrust actions. n120 The industry's origins derive from a series of patents obtained by Thomas Edison and others in the late nineteenth century. One company [*155] controlled a large share of production and distribution of feature films through its ownership of patents until 1912-1918 when it lost a series of antitrust cases and a major case involving the validity of a key patent. New entry soon followed with the antecedents of many of today's major film distributors - Universal, Fox, and Paramount - emerging as major producer-distributors.

The exhibition of feature films was consolidated into a number of "circuits," many of which, in turn, formed First National Exhibitors' Circuit. First National soon began to finance and distribute the films exhibited in its theaters. After World War I, vertical integration between film distributors and theater chains began to proliferate. Theater owners integrated into distribution to avoid the market power of distributors, and distributors countered by entering the exhibition business. By 1931, six of the firms that would subsequently be defendants in the Paramount case had control of nearly 2,500 theaters across the country. By this time, many distributor practices that were alleged to constitute a pattern of behavior violating the Sherman Act - such as block booking - emerged. As a result, the distributors were repeatedly involved in antitrust suits long before the Paramount litigation was launched in 1938.

1. Industry Structure

The Paramount case was brought in 1938, and the complaint was amended in 1940. n121 The defendants were the five "major" distributors - those who owned theater chains - and three "minor" distributors. These eight firms apparently controlled 95% of total film rentals in the early 1940s and accounted for roughly two-thirds of all feature film releases. n122 Each distributor effected national feature film distribution through a large number of "exchanges" in major urban centers, who

essentially monitored and enforced rental agreements with theaters. No major distributor was so integrated into distribution as to be able to exhibit its films solely in its own theaters. As a result, each major distributor realized substantial rentals from the theaters of its four integrated rivals.

The eight Paramount defendants also exhibited their films through a large number of independent theaters. Indeed, these independent theaters and theater circuits accounted for about [*156] half of all theatrical rentals in the early 1940s. While several different major distributors often owned theaters in the same town, these holdings were frequently operated jointly as a "pool," and these pooling arrangements extended to independent theaters as well.

At the time the Paramount case was brought, seven of the distributor defendants owned production facilities and had extensive long-term agreements with actors, directors, and other talent. By the time the trial had begun, however, the "studio" system of long-term, exclusive contracts was in decline. Independent producers existed, but these producers were forced to distribute their films through one of the eleven national distributors. Because production was fragmented, the government was unable to argue successfully that the defendants had monopolized this stage of production.

2. Antitrust Actions

Antitrust actions against distributors and theater chains were very common throughout the industry's pre-World War II history. Many cases involved allegations of conspiracies to fix theatrical admission prices or rental terms or to restrict output to competing theaters. n123 Some of the alleged abuses - fixing minimum admission prices and licensing terms for each picture - were virtually identical to the charges in the earlier cases against theater circuits.

However, the complaint in the Paramount case, as amended in November 1940, went much farther. The eight defendants were charged with fixing license terms for feature films, excluding independently produced films, controlling first runs of films in their own theaters, and even pooling profits in territories where two or more of the five majors operated theaters. n124 These charges were quickly followed by a consent decree that limited the defendants' ability to engage in various tying or "block booking" practices and provided for arbitration of disputes with unaffiliated theater owners who felt they had been unfairly denied access to the defendants' [*157] films. n125 Most of these disputes involved clearances - the timing of licensing films to different theaters in the distribution chain. These clearances were employed to enforce a system of price discrimination.

In 1944, the government moved to modify the 1940 decree, arguing that this decree had not eliminated the anticompetitive abuses. A full-blown trial ensued in 1945-1946, resulting in a government victory in the district court in December 1946. n126 The court found that a large number of practices violated sections 1 and 2 of the Sherman Act, including:

1. The fixing of uniform admission prices - both among the defendants and between the distributors and their theater licensees;
2. The system of uniform length or runs and clearances among theaters;
3. "Formula deals" between distributors and entire theater chains or circuits;
4. Block booking - i.e., tying arrangements; and

5. Pooling agreements. n127

The district court refused to order divestiture of theaters from the five major distributors, but issued a decree that prohibited a large number of the offenses alleged by the government to be anticompetitive. n128 Agreements to maintain uniform admission prices and clearances among theaters were banned. Clearances had to be reasonable and could not be granted against theaters not in substantial competition with each other. The court required that a system of competitive bidding among theaters for each run of a feature film be installed to replace these collusive practices. Various restrictions on block booking and circuit-wide formula deals were also in the decree. n129

In 1948, the Supreme Court upheld the lower court in most respects, but it found the system of competitive bidding unworkable. n130 Instead, it ordered the lower court to reconsider divestiture. n131 Interestingly, the Court's reversal of the competitive bidding relief was based on its fear that such a mechanism would [*158] require the federal courts to be too involved in the day-to-day operations of the industry. n132 As it developed, however, the structural remedy required substantial continuing enforcement efforts as distributors attempted to devise new approaches to exhibiting their films.

As a result of the Supreme Court decision, two of the major distributors entered into consent agreements divorcing their theaters and even divesting some of their theaters before the divorcement. In decrees entered in 1950-1952, the lower court ordered the other three major distributors to divest their theater chains. n133 Stock ownership of the divorced theater circuits and the major distributors was to be kept totally separate. n134 All eight defendants were still subject to the injunctive relief in the original decree except for the competitive bidding requirement. n135

3. The Effect of the Decrees

The primary objective of the Paramount decrees was to impede the eight defendants' collusive, joint-profit-maximizing activities. Absent collusion in the licensing of films to each other's theater circuits and in licensing and exhibiting films, distributors would have to compete for theater space by offering attractive rental terms. These terms, in turn, would be available to large numbers of theater owners who would decide which films to bid for and how long to run them. Independent distributors would then have better access to theaters, and the independents should be able to take market share away from the eight defendants. Entry of new distributors might also occur, further reducing the defendants' market shares. If this scenario had played out, one might have expected the distributors' share of theatrical revenues to fall, admission prices to decline, and the number of distributors and annual film releases to increase. In fact, none of these events occurred.

A major complication in analyzing the development of the motion-picture [*159] industry after the Paramount decision was the sudden change in the entertainment habits of U.S. households that occurred after 1948. The introduction of television as a mass medium at precisely this time led to a dramatic decline in theatrical admissions. Total theatrical admissions fell by more than two-thirds between 1948 and 1958, n136 and by another fifty percent between 1958 and 1967. n137 As a result, large numbers of theaters closed, but substantial excess theater capacity remained in 1967. n138 As in Standard Oil and Alcoa, unanticipated changes in market conditions had enormous impacts that the designers of the decrees could not foresee.

Despite these negative trends, the average real price of a movie ticket actually rose over the two decades following Paramount. The Consumer Price Index (CPI) for indoor theaters rose by 36.4% between 1948 and 1958, a period in which the overall CPI rose just 20.1%. This trend continued over the 1958-67 period, with the CPI for indoor theaters rising by 68.9% while the overall CPI rose by just 15.5% n139 (see Figure D-1). In a sharply contracting industry, one might have expected substantial downward pressure on prices, particularly if the Justice Department had just succeeded in breaking a cartel of distributor-exhibitors, which had previously succeeded in fixing admission prices. Instead, real theatrical admission prices rose substantially after Paramount. n140

[SEE FIGURE IN ORIGINAL]

Figure D-1

Consumer Price Index for Indoor Movie Admissions and All Urban Consumers (1967 = 100)

The objective of the Paramount decrees had been not only to eliminate a price-fixing conspiracy in motion-picture admissions, but also to open the theaters to competing producer-distributors, thereby breaking the grip on distribution held by the eight large Hollywood distributors. However, there was little entry into motion-picture distribution in the years following the Paramount decision. RKO declined rapidly and exited the industry in 1957 due to internal problems deriving from Howard Hughes's ownership of the company. The remaining seven defendants actually experienced an increase in their collective share of total motion-picture rentals between 1948 and 1954. Thereafter, their share [*160] fell for a few years due to a disastrous set of releases, but then rebounded by 1966-1967 to between 70-72% of U.S. rental revenues, only slightly less than their 1948 share of 76%. n141 It was almost twenty years before major new entry occurred in the form of two U.S. television networks that began to finance their own feature films. During the 1948-1967 period, the major distributors steadily reduced the number of feature film releases from 248 to about 150, and U.S.-produced independents also contracted supply substantially. Thus, the Paramount decrees did not succeed in introducing new competition or new competitors in theatrical motion picture distribution. After twenty years, the seven survivors of the Paramount litigation continued to account for nearly three-fourths of all U.S. theatrical rentals. n142

Given the sharp decline in demand for theatrical admissions, one might have expected Hollywood distributors to be more aggressive in attempting to market their films to a sharply declining set of U.S. theaters, particularly if they were just being liberated from membership in a cartel. In fact, they reduced supply steadily and held the line remarkably on price competition for the 1948-1967 period. As real admission prices rose, the distributors successfully captured most of the additional revenues for themselves. [*161] The share of theatrical admission receipts that they captured rose from 30.4% in 1948 to 45.8% in 1967. Thus, the distributors captured approximately two-thirds of the real increase in theater ticket prices during this period. Surely, this is not the result one would have expected from a decree that ended collusive practices among distributors.

The large number of court decisions and the number of defendant companies complicate the attempt to estimate the effect of the Paramount case on the defendant companies' stockholders. In general, the announcement of the filing of the case in July 1938 had a large negative impact on the common equities of the larger, integrated defendants, but the opposite effect on the minor unintegrated distributors, Universal and Columbia (see Table D-1). However, the amended complaint and the subsequent consent decree in November 1940 were followed by enormous positive excess returns for both the major and minor distributors. When the government reopened the case in August 1944 by petitioning the court to modify the 1940 decree, the stockholder excess

returns were understandably negative for all but one of the major distributors, but positive for one of the two minor distributors who had no theaters to divest. Finally, the Supreme Court decision in 1948 generated very large negative returns for the major distributors as well as both of the minor distributors. In short, the market does not appear to have foreseen the devastating effect of television on theatrical admissions, reacting very badly to the forced divestiture of theaters!

Table D-1

Cumulative Six Month Excess Returns to Paramount Defendants' Stockholders During Major Antitrust Events, 1937-1951

[SEE TABLE IN ORIGINAL]

4. What Went Wrong?

Clearly, the Paramount decrees did not succeed in creating a more competitive motion-picture industry. At least two possibilities explain why the decrees did not achieve their goal.

First, the government may have erred in charging the defendants with a violation of the Sherman Act. If the conduct of these companies was not collusive prior to 1948, or if their actions did not result in a reduction of output or higher theater admission prices, the suit should never have been filed. DeVany and Eckert argue that the practices assailed by the government - the agreement on clearances and length of runs - were required to provide a stable environment for the exploitation of feature films and to [*162] provide information on the demand for each film. n143 As a result, barring such practices or breaking the ownership ties between distributors and theaters reduces the efficiency of the distribution system. The result would be higher costs, higher rental rates, and fewer feature film releases - precisely the results obtained after 1948.

A second possibility is that the collusive arrangements that existed among distributors and exhibitors were successful in reducing output and raising prices, but that the decrees were not successful in ending such collusion. After decades of agreeing on clearances and lengths of runs, the seven remaining Paramount defendants would still be able to collude tacitly by reporting their revenues from each theater to the trade press, thereby being able to detect any deviations from the implicit cartel agreement. If a theater dropped a film earlier in its run than expected, given its box-office revenues, distributors would surely be able to infer that the distributor of the film that replaced it had cut its rental rate to obtain the clearance. Thus, by simply reporting to trade publications each week their results on a theater-by-theater basis, the implicit cartel could have continued.

It is even possible that elements of both theories are correct. [*163] The decrees might have made it more expensive to distribute feature films without allowing new entry and without stimulating enhanced competition among the defendants. The result could have been higher prices and lower output than would have existed without the decrees. Whatever the explanation, it seems clear that the motion-picture industry did not become more competitive as a result of vertical divestiture of theaters from distributors.

The Paramount case once again illustrates the difficulty in designing a decree that is effective when market conditions are changing dramatically. Like American Tobacco, it also demonstrates that structural relief may not create the conditions for aggressive competition. Modifications in the

decree may be frequently required to adjust for changes in market conditions and the realization that the decree is simply not working.

E. United Shoe Machinery

United Shoe Machinery Corporation (USM) began operations in 1899 with the acquisition of five shoe machinery manufacturers, three of which were dominant companies in their segment of the industry. n144 These acquisitions provided USM with a prominent position in the major segments of shoe machinery manufacturing. The company grew rapidly thereafter, acquiring a number of other companies, and eventually centralizing its manufacturing operations in one plant in Massachusetts. n145

Over the next fifty years, USM faced a number of legal challenges that alleged various violations of the Sherman and Clayton Acts. As early as 1911, USM faced a civil suit charging it with combination in restraint of trade and monopolizing in violation of sections 1 and 2 of the Sherman Act. n146 USM won the suit, but was faced with another in 1915, charging that USM's equipment leasing practices violated section 3 of the Clayton Act because of tying and exclusive-use provisions in their contracts. n147 The government won this suit, resulting in a court decree that required USM to modify the terms of its leases. n148 The third major antitrust case against USM was brought in 1947, [*164] charging USM with violations of section 1 and section 2 of the Sherman Act. The district court ruled against USM in 1953 and the Supreme Court upheld the ruling in 1954. n149 Although the 1953 decree did not result in divestiture, a review of the case in 1964 led to a Supreme Court decision that instructed the lower court to consider divestiture, and, in 1969, a substantial share of USM's assets were divested. n150 Emhart Industries purchased USM five years later.

1. USM's Products and Services

USM manufactured a full line of machines used specifically for producing shoes. By the 1940s, USM offered more than three hundred types of machines, of which a shoe manufacturer might need as many as one hundred to perform the operations required to produce a shoe. n151 These included clicking machines, lasting machines, eyeleting machines, outsole stitching machines, and heel-attaching machines, to name only a few. Factories engaged in the manufacture of shoes required a large number of different machines.

USM's customer base consisted of shoemakers across the United States. These were typically small enterprises (although several were very large, and one or two were nearly the size of USM). In 1947, there were approximately 1,650 shoe factories in the United States, operated by 1,460 firms. n152 The number of factories and the volume of shoe production increased rapidly between 1915 and 1947, but declined after 1958. n153

USM offered its shoe machines through a combination of sale and lease programs. Shoe machines were extremely complex and often experienced technical problems or failure. As a result, in addition to offering machines for sale or lease, USM provided repair and advisory services relating to both machines sold by USM and to the shoe-making process in general. Factories engaged in the manufacture of shoes often needed advice on the selection and layout of machines and timely repair services. As a [*165] result, USM employed forces of roadmen who could be dispatched quickly to shoe factories for such advice and repair services. n154

2. Market Shares

USM had a very large share of the sale or lease of major shoe machines, and a slightly smaller proportion of the market with respect to minor machines. Table E-1 shows USM's share of the outstanding major and minor machines in shoe manufacturing plants in 1949 and the share of the market held by its competitors. n155

Table E-1

Share of Major and Minor Machines by Manufacturer, 1949

[SEE TABLE IN ORIGINAL]

USM was dominant in large machines while USM's principal rivals competed by offering a more limited line of machines. None of the rivals was a large manufacturing enterprise. As a result, the rivals were "essentially shoe machinery or machinery-and-supplies businesses, and their small scale in the machinery field indicates their overall smallness and weakness relative to [*166] USM." n156

3. The Government's Case Against USM

The government claimed that USM had monopolized the shoe machinery market through the use of leases that impeded the purchase or lease of their competitors' machines. Specifically, the government charged that several provisions of USM's leases were exclusionary. Among the most important of these provisions were: (i) the ten-year terms of the leases; (ii) the return charges or deferred payments due upon early termination of a lease; (iii) the minimum monthly usage charges on machines subject to per-unit payments; and (iv) the "full-capacity" clause, which required lessees to use the machine to produce all shoes that the machine was capable of producing. n157

In addition to these provisions, USM would waive the monthly rental and minimum-usage balances due on unexpired leases when machinery was returned for reasons other than the substitution of a competitor's machine. USM would charge the shoe manufacturers with violating the full-capacity clause only in cases in which a competitor's machine was used. Penalties were waived when the full-capacity clause was not met as a result of changes in demand, conversion to manual operations, or replacement with another USM machine. n158

USM's market power was allegedly enhanced by a number of other factors. First, USM offered a full line of machinery, which gave it the ability to use tying practices and to employ price discrimination against its rivals, charging low markups for machines that faced competition and high markups for those facing no competition. n159 Second, USM held a large number of patents, which made it difficult for any potential rival to develop machines or techniques that did not somehow infringe on a USM patent. n160 Carl Kaysen, an economist who served as a "clerk" to Judge Charles E. Wyzanski, Jr. for this trial, conceded that he could not fully dismiss the theory that USM was a natural monopoly due to the small size of the shoe machinery market. However, his observations on the small lot size for parts and machine [*167] manufacturing in USM's Massachusetts plant led him to conclude that USM was probably not a natural monopolist. n161

4. The Government's Victory and Proposed Relief

In February 1953, the district court found that USM had violated section 2 of the Sherman Act by illegally monopolizing the shoe machinery market and the market for some shoe machinery supplies. n162 USM appealed, but the Supreme Court upheld the district court's decision. n163 The government requested the division of USM into three full-line manufacturers and the separation of all supply activities from the machinery business. The major obstacle was the fact that USM produced its entire output in a single manufacturing plant. In addition, the government sought an end to USM's reliance upon leasing and the dissolution of USM's outstanding leases. This remedy, in conjunction with modifications in USM's patent policies and a ban on USM's expansion through acquisitions, would be expected to reduce barriers to entry. n164

The court declined to order USM's dissolution, but instead structured a decree that focused heavily on USM's leasing policy. n165 Under the decree USM was forced to offer its machines for sale as well as lease, but it could not structure the lease and sales terms in a fashion that would make it substantially more advantageous to lease the machines. n166 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. n167 Return charges or deferred payments were banned. n168 USM was barred from acquiring any shoe machinery factory or shoe supply business, or stock in such business, for more than \$ 10,000. n169 USM was also severely restricted with respect to the acquisition of patents. n170

The decree was intended to stimulate competition in at least three ways. First, by stimulating the purchase of machines, the [*168] decree might create a vibrant second-hand market. These second-hand machines would serve to limit USM's market power in the sale or lease of new machines and provide potential entrants with valuable information about USM's technology. Second, by limiting the lease term and discriminatory termination fees, the decree might induce shoe manufacturers to choose more competitors' products. Third, by creating a second-hand market and stimulating incremental sales of competitive machines through a relaxation of USM's leasing terms, the decree might create an active independent repair sector, freeing shoe manufacturers from reliance on USM's technical staff.

5. The Effect of the Decree

After ten years, the trial court held hearings on the effectiveness of the decree and concluded that the decree was generally working as expected. Specifically, Judge Wyzanski found that:

USM's market share of lease and sale revenue fell from approximately eighty-five percent in 1953 to approximately sixty-two percent in 1963.

USM's lease and sales revenue fell from approximately \$ 32 million in 1953 to approximately \$ 24 million in 1963.

The number of new entrants had increased, and machinery shipments of USM's principal competitors had increased substantially.

USM shipped only 51.7% of all shoe machines shipped in 1963.

A second-hand market had been established.

Approximately fifty-four percent of machines in shoe factories in 1963 were made by USM, but only forty-seven percent had been obtained from USM.

In 1963, only seventeen percent of leased machines in shoe factories were leased from USM.

Between 1953 and 1963, shoe factories purchased approximately 53,000 previously leased machines from USM. n171

Table E-2 shows the decline in USM's share of shoe machinery lease and sales revenues between 1947, the year the case was brought, and 1963, the year before the review of the decree in the district court. n172 No single firm attained a very large market [*169] share, but USM nevertheless lost about one-quarter of its pre-existing share because the rate of entry increased following the decree. According to Don E. Waldman, an economist who has studied the results of antitrust actions, "in three-year segments of the period from 1955 to 1965, the number of entries into shoe machinery manufacture increased, respectively, by 11, 19, and 26." n173 However, Waldman offers no evidence that such entry was atypical of the pre-decree period, nor that the entrants provided much competition for USM. The "other" competitors' share of industry revenues, shown in Table E-2, rose only by 8.9 percentage points in sixteen years.

Table E-2
Shoe Machinery Revenue Shares, 1963 v. 1947 (percent)

[SEE TABLE IN ORIGINAL]

While there were substantial increases in the total revenue of USM's competitors in the nine years following the decree, from 1954 to 1963 (see Table E-3), n174 USM's revenue gains were about double the sum of the four major competitors combined.

Table E-3
Total Revenue (in thousands of dollars)

[SEE TABLE IN ORIGINAL]

The market for second-hand machinery also grew following [*170] the decree. In 1963, used machine dealers received 8.2% of total national revenues from the lease and sale of shoe machinery. Used machinery dealers sold 35.2% of the shoe machines leased and sold in 1963, n175 and they offered machines in 108 of 177 separate operations identified by a USM consultant. n176 The growing market for second-hand machinery was one of the decree's objectives.

Figure E-1
USM's Profit Margin and Rate of Return on Equity, 1944-1961

[SEE FIGURE IN ORIGINAL]

For the first two years after the decree was entered, USM's net income increased and reached an all-time high, apparently because of the sale of USM machines that had low book value and because of an increase in lease prices. n177 Waldman argues that the high prices following the decree may have been a result of USM attempting to placate the court, but such behavior is hardly consistent with Waldman's view that USM suffered a reduction in market power. n178 Moreover, USM's rate of return on equity [*171] was little affected by the decree (see Figure E-1). In the first two years, as explained above, USM's return on equity rose, but thereafter it returned to the levels of 1945-1953.

Given the heterogeneity of shoe machinery, there is no available index of shoe machinery prices before and after the decree. Therefore, an indirect test of the decree's effect on prices is required. If the decree had succeeded in reducing machinery prices, shoe manufacturers should have incurred lower machinery expense relative to the value of shoes produced. In the short run, a lower price of shoe machines probably would not result in much substitution of machines for labor. Yet, the ratio of shoe machinery shipments to shoe shipments declined from 0.014 in 1947 to 0.012 in 1954, but then remained constant at 0.012 in 1958, 1963, and 1967 n179 (see Figure E-2). In 1972, this ratio rose sharply - perhaps in response to machine sales following the revision of the decree in 1968, but then declined equally as sharply in 1977. n180 The average ratio was 0.015 for the 1972-1977 years combined, or approximately its value in the year the case was filed. That the value of shoe machinery shipments did not decline relative to the value of shoes is surely suggestive of, but not proof of, the absence of the decree's effect on shoe machinery prices.

Figure E-2

Value of Shipments of Shoe Machinery/Value of Shipments of Shoes, 1947-1967 and Shipments of Footwear

[SEE FIGURE IN ORIGINAL]

The court's decision also had several other less quantifiable effects on USM and the shoe machinery industry in general. USM's ability to combat free riding was reduced, as was USM's incentive to commit resources to developing new technology. In addition, the number of rentals increased. The share of imports rose, from a very small fraction before 1950 to 25% by 1964, and continued to rise thereafter. n181 Finally, the U.S. shoe industry began to decline in the late 1950s (which may or may not have been related to the decree). n182

It is clear that stockholders anticipated the mild effect of the decrees on USM's fortunes. When the initial complaint was filed in 1947, the stock market reacted very mildly to the news (see Table E-4). Even the adverse ruling by Judge Wyzanski in 1953 is associated with only a -0.3% decline in the stock price in the [*172] same month, and the excess returns are actually positive over the six-month window. In total, the complaint and the lower court decision are associated with less than a two percent negative excess return to stockholders. However, when the government lost its 1954 appeal to the Supreme Court on the lack of structural relief, these negative excess returns were wiped out. Over the three event windows, the excess returns to stockholders were positive.

Table E-4

Excess Returns to USM Stockholders During Major Antitrust Events, 1947-1954

[SEE TABLE IN ORIGINAL]

6. The 1964 Review of the Decree

After the 1964 review of the evidence, the lower court ruled that sufficient competition had been introduced into the shoe machinery market as the result of the decree, and that the decree should stand "unmodified." n183 On review, however, the Supreme Court disagreed and recommended that the lower court consider [*173] "more definitive means" to achieve competition. n184 As a result, the company was forced to divest itself of approximately one-third of its remaining shoe machinery manufacturing operations in 1969. Thus, the government finally obtained structural relief twenty-

two years after first filing its case at a time when - much as in the case of Paramount - the U.S. shoe industry began a steep decline.

7. Conclusion

There is at least a modicum of evidence that the antitrust action against USM succeeded in creating a more competitive shoe machinery market after 1953. Entry occurred; USM lost market share; and the second-hand market blossomed. On the other hand, there is no evidence that the prices of machines fell or that innovation flourished. The ratio of shoe machinery shipments to shoe shipments did not decline. USM's return on equity remained relatively constant, and the stock market reacted benignly to the passage of the case through the courts.

F. The Television Network Cases

For several decades, the Federal Communications Commission's (FCC's) spectrum-allocation policy limited the number of television broadcast stations in major metropolitan areas. As a result, there were only three commercial broadcast networks in the United States because a fourth network could not assemble a large enough roster of affiliates to compete. n185 The inevitable result of this market concentration was public concern over the networks' power in several arenas. In the 1960s, the FCC conducted [*174] an inquiry into network program procurement practices that was to result in the promulgation of rules limiting network "ownership" of programming, including participation in the marketing of reruns of their network series, referred to as "syndication." n186 At about the same time, the Justice Department launched an inquiry into network programming practices that would eventually result in antitrust cases filed in 1972 against each of the three networks n187 and in three antitrust consent decrees.

1. Network Television

The commercial television networks developed as organizations to distribute mass entertainment programming across the country through hundreds of independent and network-owned local broadcast stations. The exploitation of mass entertainment programming requires national distribution. But because the FCC limits the number of local stations that any single entity may own, a national broadcasting company cannot reach its audience solely through its own stations. It is forced to negotiate affiliation agreements with broadcast stations throughout the country.

Network programming is produced by the networks themselves and by hundreds of different entities generally involved in the theatrical motion picture business. n188 Programs are generally developed as continuing "series" that appear at a regular time period each week. Because these programs are expensive to produce, few are developed without a distribution agreement, i.e., a network contract. Networks often provide development funding for "pilot" productions before committing to a year's output of a given series.

Popular network television series have value in foreign markets and in further exhibition as "reruns" in domestic markets. [*175] As a result, the seller of a program series will not generally recover its full production costs from the network run alone. The talent involved in its production - the actors, producers, directors, etc. - is able to command salaries that reflect its market value in all

of these markets. Thus, when a network purchases a new network series, its payments for these programs will not fully defray the supplier's costs.

Early in the development of the television industry, networks shared the risk in developing program series with their program suppliers by purchasing the rights to distribute the program to the foreign market or as reruns in the domestic market or by sharing in the profitability of such "syndication," or both. In the 1960s, the major program suppliers, principally the large motion picture companies, argued that this network participation in reruns was being demanded from them at non-compensatory prices and therefore should be forbidden by the FCC. n189

2. The Antitrust Suits

When the networks began to enter the motion-picture business in the late 1960s, the Justice Department also began to investigate network program "ownership" and the market power of the networks in programming. In 1970, the FCC enacted its financial interest and syndication rules, n190 and the Justice Department's inquiry languished. The FCC rules banished the networks from the syndication market and forbade them from acquiring any interests in the financial returns from the subsequent exhibitions of their programs. The rules did not bar the networks from producing their own programs or syndicating them in foreign markets. They could not, however, engage in the domestic syndication - i.e. the sale of reruns to U.S. television stations - of even those programs that they produced themselves.

The Justice Department inexplicably renewed its interest in the network programming issues in 1972 and brought suits charging each network with attempting to monopolize the prime time programming on its own network. n191 These curious charges implied that each network's prime time programming was a separate antitrust market. The cases were never fully litigated, and therefore the absurdity of this theory was never fully exposed to the adversary [*176] process. Instead, the networks each negotiated consent decrees with the Justice Department, which included the provisions of the FCC's financial interest and syndication rules and further provisions to limit the amount of programming that each network could produce for itself. n192 These decrees thus drove a greater wedge between distribution and production, requiring the network to purchase a minimum amount of their programming from outside companies - mostly the motion-picture companies. They also provided greater assurance to the motion picture companies that the FCC could not, by itself, repeal the rules that barred the networks from the syndication market and from the purchase of financial interests in these programs. The networks were thus barred from these activities by federal antitrust decrees as well.

3. The Decrees and Related FCC regulations

From the outset, the case against network program "ownership" was one of network monopsony power. n193 The networks allegedly used this power to depress the total price of their programming - the price for the initial network run less the expected returns from their right to syndicate it (if they obtained it) and any interest they obtained in the profits from subsequent distribution of the programming. The popular version of this theory, advanced by the motion picture studios, was that the networks used their power to force their suppliers to accept non-compensatory prices, but such a theory is obviously incorrect. The networks could not force the Hollywood studios to provide them programming at a loss. To the extent that the monopsony theory had any merit, such power must

have been exercised through a reduction in the number of programs purchased each year. If the networks had monopsony power, an unlikely possibility, it was because FCC spectrum allocation policies limited the number of broadcast networks to three.

[*177] The irony of the network cases is that the originator of the theory of network dominance over programming - the FCC - subsequently ruled that the networks must reduce their prime time programming by one-half hour per day on weekdays. This "Prime Time Access Rule" was promulgated in 1972 to introduce more distributors into national television by the same agency that had limited the number of such distributors through its limitation on the number of broadcast stations it allowed in each market. n194 The FCC now asserted that it wished to increase program diversity by simply changing the identity of the three distributors for this one-half hour per day. Unfortunately, the Prime Time Access Rule did not create new "networks," but rather spawned a large number of inexpensive game shows that typically carried more advertising minutes than the network series they displaced.

Curiously, the three national television networks were supportive of the Prime Time Access Rule within a few years after it was promulgated. They saw the Rule as beneficial as long as it reduced the supply of quality programming and increased advertisers' demand for commercials in this reduced supply - particularly in periods of economic recession. Subsequently, the networks agreed to limit their own program production in the antitrust consent decrees. n195 They were being forced to reduce programming hours anyway and did not view the threat of self-supply as an important source of bargaining power in procuring programs from the Hollywood studios.

4. The Result of the Decrees

The decrees and the FCC syndication rules could not have cured network monopsony power, even if such power had existed. The number of buyers of programming was unaffected by these interventions because they did not increase the number of networks. These three networks had to continue to bid for programming against motion picture producers, the live theater, and other media who employed actors, directors, cameramen, film-tape editors, etc. However, the decrees and the FCC rules did reduce the number of firms in the syndication market and the [*178] number of large companies who could finance risky programming series by obtaining a share of their downstream returns.

Prior to the FCC rules, each network had about 6% of national program syndication revenues. In 1971, before the FCC rules began to have an effect on syndication markets, the seven major motion picture studios' domestic syndication accounted for just 22.5% of the total viewer hours of nationally syndicated programs. In 1981, the year after the consent decree was negotiated, this share had risen to 36.9%. By 1989, the seven motion picture companies accounted for 41.1% of viewer hours from national syndication and 58.5% of viewer hours from syndicating network reruns. n196 This increase in concentration was the direct result of banning three of their major competitors from the syndication market.

Equally important was the effect the FCC rules (and the network decrees that incorporated them) had on risk sharing of new programming development. In the 1969-1970 television season, the four largest suppliers of new network programming accounted for 33.5% of revenues from network program purchases. By 1988-1989, this four-firm share had risen to 47.1% because the networks could no longer share in the risk of programming by purchasing syndication interests in

these programs. n197 Smaller producers were forced to seek other sources of risk capital, and the large motion-picture companies were the obvious alternative.

Because the networks were uniquely positioned to bear program risk, denying them the right to acquire financial interests in the programs they purchased and limiting their ability to produce their own programs changed the composition of their new program series. The risk of innovative new programming had to be borne by others who were less well-positioned to bear it. As a result, the variance in network program ratings declined after 1972, reflecting a program acquisition process that resulted in less daring, and therefore less risky, new program series. n198 Further evidence of this decline in risk taking may be found in the variance in the average number of years that prime time network shows were kept on the air. Between 1963 and 1972, this variance [*179] in the run length of new series increased. After 1972, however, it decreased steadily, reflecting the fact that network programming was less innovative, and thus less subject to early cancellation, after the FCC promulgated the rules that were incorporated into the antitrust consent decrees. n199

The FCC rules would have had adverse effects on innovation in network television programming by themselves, but the consent decrees' limitation on the networks' ability to supply their own programs surely exacerbated this unfortunate result. The networks could not underwrite the risks themselves through self-supply, but were instead increasingly dependent on the large Hollywood studios for programming. The result was less innovative, risky programming.

5. A Concluding Assessment

The network antitrust cases, like the 1970 FCC Financial Interest and Syndication Rules, were based on a faulty analysis of the television network program acquisition process. The networks purchased programs from a large number of suppliers and had to compete with other media to attract such programming and the talent required for its production. Barring the networks from owning rights or profit shares in later exhibitions of this programming (syndication) and limiting their ability to supply their own programming led to an increase in program supply concentration. It also reduced the efficiency of bearing the risk of innovative new programming. By the time the FCC rules were repealed and the network antitrust decrees were vacated, these results were widely acknowledged. n200 Nevertheless, it was not until cable television had decimated the networks' share of total television viewing that the regulators and the Justice Department could agree to end these unfortunate restrictions on efficient program supply.

G. AT&T

The 1974 AT&T case is often cited as an overwhelming government antitrust policy success because long-distance competition grew substantially soon after the breakup of AT&T in 1984. [*180] In fact, as discussed below, it was not the vertical divestiture in the decree but a seemingly small change in one regulatory requirement that provided the environment that propelled competition. Federal regulators could have enacted this provision ten years earlier and avoided the need to break up AT&T.

1. Origins of Telephony

The telephone industry in the United States has been tightly regulated by state and federal authorities for much of the past century. Although it was often assumed to have many of the characteristics of "natural monopoly," the telephone industry did not evolve naturally through market forces. Instead, its structure was heavily influenced and even dictated by regulatory and antitrust authorities.

The telephone sector began to develop in the late nineteenth century as the result of several patents, the most important of which were registered by Alexander Graham Bell. Telephone exchanges were developed to route calls among these patented devices. In the United States, these exchanges were developed by the Bell and related companies almost exclusively until the expiration of the original patents in 1893. Thereafter, "independent" local telephone companies began to proliferate in major cities. n201

At first, telephony was local because a satisfactory technology for transmitting calls over long distances did not exist. However, improvements in technology and the development of the vacuum tube allowed calls to be transmitted over increasing distance. The Bell companies - under the parentage of the American Telephone and Telegraph Company (AT&T) - began to patent and deploy this technology, but they often refused to allow the independent telephone companies to interconnect with their "long-distance" service. As a result of this handicap and the intense price competition with the Bell companies, many of the independents eventually chose simply to sell their companies to AT&T. These practices (and others) first placed AT&T in the cross hairs of the antitrust authorities in the early part of the twentieth century. To avoid a Sherman Act suit, AT&T agreed to cease its acquisition of independent telephone companies, to [*181] provide interconnection, to sell certain assets, and to submit to federal regulation.

2. Industry Structure before 1974

After World War I, AT&T was permitted to resume its acquisition of independent telephone companies. n202 By the 1930s, it controlled approximately 80% of local exchange lines in the country. It was also the country's only national long-distance company. Through its Western Electric operations, it produced most of its own transmission, switching, and terminal equipment, much of which was developed from ideas that originated in its Bell Laboratories.

Throughout the interwar period, AT&T and the smaller "independent" telephone companies were regulated by state regulatory commissions and by federal authorities. The 1934 Federal Communications Act established the FCC as the regulator of interstate services, but the FCC was not very active in regulating telephony until after World War II. During the interwar period, most of the regulatory and antitrust concern about AT&T centered on its ownership of Western Electric and the effect of such ownership on the prices charged to AT&T's operating divisions.

After World War II, the states and the FCC responded to a court decision that required that the joint (nontraffic-sensitive) costs of local networks be recovered in part from the interstate jurisdiction - i.e., from interstate long-distance services. This resulted in an increasing share of these local-network costs being recovered from interstate calls through an obscure process, which, in turn, led to long-distance calls being priced far above long-run incremental cost. Through this artifice, the states were able to keep the price of residential connections low, particularly in high-cost, low-density areas. n203

In the 1960s, the FCC began to consider more liberal policies towards entry of competitive carriers in interstate services. In 1969-1971, it opened dedicated "private-line" business services to entry, but it did not extend this entry to ordinary (switched) interstate long-distance services, whose rates had been kept far above long-run incremental cost. The new entrants into private- [*182] line services could easily extend their operations into the interstate long-distance market if they obtained the FCC's permission and could arrange for the local AT&T and independent companies to deliver their calls. Alternatively, they could do so surreptitiously by leasing connections that would deliver such services while pretending to offer only dedicated private-line service.

MCI availed itself of the latter opportunity in 1974, offering ordinary switched long-distance service without FCC authority. The FCC responded by attempting to ban MCI from offering this service, but it was rebuffed by the federal courts. n204 In this rather unusual manner, long-distance competition was born, and the FCC was altogether unprepared to deal with it. The entire long-distance network had evolved as a monopoly of AT&T, whose network was connected to those of the monopoly local carriers, including those of its own Bell companies. MCI could not obtain equivalent connections because AT&T's switches were not designed to offer equal access to competitive long-distance carriers.

At approximately the same time, AT&T and the other independent (monopoly) local carriers controlled the use of customer terminal equipment on their networks. Telephone service was offered under state tariffs that did not allow customers to connect their own equipment to send or receive calls. A series of legal challenges to these restrictive tariff provisions narrowed the companies' ability to limit non-interfering customer attachments, but it was not until the mid 1970s that the FCC tried to open all terminal equipment to competition. By 1976, the courts had rebuffed state regulators' challenges to the FCC's terminal equipment policy, allowing competitors to sell customers telephone handsets, answering machines, and other devices as long as they were certified as posing no threat to the operation of the network. n205

3. The 1974 Antitrust Case and the 1982 Decree

Antitrust investigations had dogged AT&T for much of its existence. In 1913, AT&T avoided antitrust prosecution through the Kingsbury Commitment, in which AT&T agreed to dispose of certain assets, to cease its aggressive acquisition policy, and to interconnect its long-distance network with independent telephone [*183] companies. An unreleased 1938 FCC report on the relationship between Western Electric and AT&T's operating divisions eventually led to a 1949 Sherman Act case whose objective was divestiture of Western Electric. This case was settled in 1956 without divestiture, but with a requirement that AT&T confine its activities to "common carrier communications services." n206

Two decades later, as the FCC moved slowly to open interstate services and terminal equipment to competition, the incumbent carriers - particularly AT&T and its Bell operating companies - were far from cooperative with the new competitors. AT&T availed itself of every opportunity to argue in regulatory and legislative proceedings against the development of competition. At the same time, it often denied the nascent competitors interconnection with its network facilities or at least delayed such interconnection through aggressive exploitation of the available regulatory processes. These actions invited private antitrust suits n207 and renewed scrutiny from the U.S. Department of Justice.

The private antitrust suits brought by AT&T's new long-distance competitors were winding their way through the federal courts when the government filed a section 2 Sherman Act suit against AT&T on November 20, 1974. n208 The complaint alleged monopolization of long-distance services and telecommunications equipment by AT&T and its various subsidiaries. The case languished for four years until reassigned in 1978 to Judge Harold H. Greene, who began to guide it towards its 1981 trial. After the government presented its case, Judge Greene decisively rejected AT&T's motion for summary judgment, and the parties quickly moved to negotiate a decree that would settle the case. n209

The government's case relied heavily on the theory that AT&T's ownership of local operating companies had provided it with the incentive and the ability to exclude competitors in long-distance services and telecommunications equipment manufacture [*184] by denying competitors interconnection with the local Bell operating companies. As a result, the decree's central provision was a total divestiture of the local operating companies from the rest of AT&T. This separation of local monopolies - which were not likely to be threatened by competitive entry anytime soon - from the rest of AT&T's businesses would allow competitors to invade these latter businesses and compete with AT&T on an even footing because the divested Bell companies would no longer have any incentive to exclude competitors.

Technically a "Modification of Final Judgment" (MFJ) from the 1949 antitrust case against AT&T, the 1982 decree barred the divested Bell companies from offering long-distance services outside "Local Access and Transport Areas" (LATAs), which were drawn around each Bell Company's major service areas. In some cases, the LATAs were only as large as a metropolitan area; in less populous regions, one LATA might include a large state, such as South Dakota. In addition, the divested Bell companies were barred from manufacturing telecommunications equipment and from offering "information" services without the court's prior approval. As discussed below, the most important provision of the decree was a requirement that the Bell companies modify their switching facilities to provide equal access to all long-distance competitors, a requirement that the FCC subsequently extended to the independent local companies.

4. Administering the Decree - Regulation from the Bench

The decree became a major enterprise for Judge Greene's court and the Justice Department's Antitrust Division staff. Many initial decisions had to be made about the design of the LATAs, the number of Regional Bell Operating Companies (RBOCs) to be established, and the method of separating AT&T's local assets from all other assets. Part of Bell Laboratories was spun off as Bellcore, a research organization to be owned jointly by the divested RBOCs. Disputes arose over who should own the inside wiring in a customer's premises, how the costs of conversion to equal access should be funded, and who should offer Yellow Pages directories.

In the twelve years during which the decree was in force, Judge Greene's court was essentially a third telecommunications sector regulator (the other two were the state regulators and the FCC), and many of his decisions were appealed to the federal appellate [*185] courts. Judge Greene was very reluctant to cede control over RBOC entry into advanced information services even though the antitrust suit did not involve allegations of anticompetitive Bell practices in information services. He was eventually reversed by the Court of Appeals for the D.C. Circuit, which ruled that the decree could not restrain RBOC information-services offerings. n210

Equally important, the trial court wrestled with the definition of "manufacturing." At issue was whether basic research and engineering of new equipment or software were to be included in the proscribed Bell activities. The court eventually settled on allowing the Bell companies to develop or modify software that is integral to the operation of hardware designed to deliver local services. However, it was always difficult to delineate research and development activities in such a manner. n211

Clearly, the most contentious issue in the twelve years after divestiture involved the restriction on interLATA services - the long-distance restriction. The divested Bell companies could offer such services over their wireless networks, but not from their in-region wireline networks. Many enhanced services might require the downloading of traffic across LATA boundaries even though the service itself was local. As the Internet developed, the distinctions between local, intraLATA, and interLATA became very blurred. Was an Internet connection that communicated with a server across the same city different from one that communicated with a server across the country? Could the Bell companies offer basic Internet service to their customers, but not provide the "backbone" services that connected its ISP to the Internet "cloud"?

The premise of the decree was that long-distance service and manufacturing were to be separated from the delivery of local/exchange service as long as the latter remained a monopoly. But how much competition would be required to permit the court to allow Bell company entry into interLATA services? Given the rapid growth of competition in central business districts from new fiber-optic Competitive Access Providers (CAPs), would the Bell companies be permitted to offer long-distance service to large business customers? Would wireless competition alleviate [*186] the local monopoly problem sufficiently to assuage the court's fears about the ability of the Bell companies to frustrate long-distance competition?

Many of the questions lingered before the court for a long time. Eventually, frustrated Bell companies filed a petition to vacate the entire line-of-business provisions of the decree, a petition that was still pending before the court when Congress interceded. In 1996, Congress passed and the President signed the Telecommunications Act of 1996, n212 which vacated the 1982 AT&T decree and substituted new regulatory provisions that the Bell companies must satisfy on a state-by-state basis to be permitted to offer in-region interLATA long-distance service. Nearly five years later, only two companies - Verizon and SBC - have succeeded in convincing regulators that they have met these requirements, and then for only five states.

5. Evaluating the Decree

It is now widely held that the AT&T decree worked in that it was associated with a substantial increase in competition in long-distance services. Customer premises equipment had already become very competitive before 1984; hence, there is little attempt to link increased competition in the manufacture of terminal equipment to the decree. But was the decree responsible for increasing long-distance competition, and - more particularly - was vertical divestiture essential to promote competition?

At the dawn of divestiture, 1984, AT&T had more than ninety percent of all long-distance carrier revenues. n213 Indeed, in the first year of divestiture, there were only two national competitors for AT&T's services - MCI and GTE-Sprint (Table G-1). This was fully a decade after MCI began offering switched interstate service, and the FCC began wrestling with what to do about

it. Over the next five years, 1985-1989, AT&T lost another 22.6 percentage points of market share to new rivals, including several new entrants, many of which would eventually become part of Worldcom. Thus, the decree appears to have worked much better [*187] than FCC regulation in promoting competitive entry. But what accounts for this acceleration?

Table G-1

Revenue Shares of U.S. Long-Distance Carriers (percent of total revenues)

[SEE TABLE IN ORIGINAL]

It is possible that the vertical divestiture in the decree is, by itself, responsible for the acceleration of long-distance competition. If this were true, the United States should be enjoying the most rapid increase in long-distance competition of any country in the world. No other country has chosen to divorce its long-distance companies from their local operations. Canada, Australia, New Zealand, and the European Union (EU) countries have opened long-distance services to competition without requiring such divestiture. The EU required all countries to open their markets on January 1, 1998, but the United Kingdom began much earlier - in 1985 - by allowing Mercury (Cable & Wireless) to enter the long-distance market. Canada followed much later, opening long distance to competition in 1992. Neither required vertical divestiture, but Canada mandated equal access for all carriers while the United Kingdom did not. The differences in the rate of growth of entrants in Canada, the United Kingdom, and the United States are quite remarkable.

The United Kingdom privatized British Telecom (BT) in 1984 and opened the long-distance market to competition shortly [*188] thereafter. It subsequently licensed new cable television companies to offer telephone service, both local and long distance. However, the United Kingdom has never required BT to modify its switches so as to offer equal access to its rivals in long distance. As a result, competition in long distance has increased steadily but not dramatically. By 1998, fourteen years after Mercury's entry, BT still had about 73% of the long distance market. n214

By contrast, Canada did not begin to allow entry into switched long-distance services until late 1992. Though not requiring the incumbent long-distance carrier, Bell Canada, to divest its local operations in the most populous two provinces, Ontario and Quebec, the Canadian Radio-Television and Telecommunications Commission (CRTC) did require all local companies to convert their switches to equal access in a very short period of time. The result has been quite notable (see Table G-2). In less than seven years, entrants have amassed a larger share of the long-distance market than new entrants have obtained in the United Kingdom in twice the amount of time. Indeed, Canadian entrants have the same market share as entrants had in the United States in 1990, fully sixteen years after MCI's entry into switched long distance.

Table G-2

Canadian Long-Distance Market Shares, 1995-1998 (percentage of minutes)

[SEE TABLE IN ORIGINAL]

The EU liberalization regime has much more extensive interconnection [*189] requirements than the simple provision of equal access. Entrants are able to lease network elements from the incumbent carriers and obtain interconnection in a variety of ways, much as in the post-1996 U.S. environment. As a result, entry into long-distance services has led to a substantial erosion of the incumbent national company's long-distance market shares in some countries in just one year even though the incumbents have not been required to divest any of their operations. In Germany and

Sweden, for example, the incumbents lost 15-20% of their long-distance market in just one year.
n215

These data suggest that the vertical-divestiture provisions in the AT&T decree were not responsible for the degree to which the U.S. long-distance market has become less concentrated. Indeed, the banishing of the divested Bell companies from interLATA services probably added to market concentration over the 1984-1999 period. All that is required to develop a more competitive long-distance market is the provision of interconnection with local carriers. If this interconnection is provided to all carriers on an equal basis, as in Canada, vertical divestiture is not required. The vertically integrated local carrier apparently cannot engage in any "subtle" discrimination that impedes the development of long-distance competition as long as its switches originate and terminate its rivals' calls in the same fashion. n216 Given the experiences outside the United States, it appears that equal access is sufficient for the development of long-distance competition.

Data on average transaction prices in the long-distance market are difficult to obtain in countries in which liberalization has occurred. Comparisons of undiscounted posted peak or off-peak prices can be misleading when numerous discount plans are offered by rival carriers. To demonstrate this, Figure G-1 reproduces two examples of tariffed rates offered by AT&T and Sprint: a daytime rate for AT&T and a lower, off-peak rate for Sprint. Note how these declined from the early 1980s to 1990-1991, but stabilized thereafter. n217 However, the average interstate [*190] long-distance revenues per minute as estimated by the FCC continued to decline slowly after 1990.

Figure G-1

Real Long-Distance Rates in the U.S. and Canada, 1980-1998

[SEE FIGURE IN ORIGINAL]

The realized rates in both the United States and Canada have fallen since 1992, when Canada initially liberalized, but Canadian realized rates have fallen much more rapidly than those in the United States. A clearer picture of these trends is shown in Figure G-2, which omits the U.S. tariffs. Indeed, by 1998 Canadian carriers realized less per minute than their counterparts in the United States. A likely reason for the lower Canadian rates is that local carriers are not quarantined as in the United States, but rather are free to compete with the new long-distance carriers, AT&T and Sprint Canada. These local carriers have every incentive to expand output as long as their marginal returns are above incremental cost, and the incremental cost of long-distance service plus local connections is very low even relative to 1998 rates. Therefore, we should expect Canadian rates to fall even farther in the post-1998 period.

Figure G-2

Average Long Distance Revenue: Canada v. U.S.

[SEE FIGURE IN ORIGINAL]

[*191]

6. Lessons for the Future

In an earlier publication, I found that the results of the 1984 decree were on balance favorable for two reasons: (1) the increase in long-distance competition that the decree created and (2) the acceleration in productivity in the industry after 1984. n218 As shown in this Article, however, vertical divestiture was not required in order to unleash competition. The imposition of equal-access

arrangements by the regulator - and deregulation of output prices - was all that was necessary. Nor was it necessary to require vertical divestiture to stimulate productivity growth. Competition for AT&T from MCI, Sprint, Qwest, Worldcom, and numerous others would surely have sufficed. AT&T subsequently realized that vertical integration between local and long-distance operations is necessary in the modern telecommunications era. As a result, it has spent \$ 110 billion to acquire two of the country's largest cable-television companies, which it will [*192] convert to the local delivery of Internet and telephony - as well as video.

Perhaps just as revealing is the voluntary divestiture of manufacturing from AT&T's operations. In 1998, AT&T spun off Lucent's manufacturing division because it felt that Lucent would be more valuable if freed from AT&T's patronage. The antitrust authorities had left manufacturing with AT&T, but divested it of its local operating companies. The market is now reversing those decisions in a much more competitive era. Similarly, in Canada, Bell Canada is keeping its operating companies but voluntarily divesting itself of Nortel, its manufacturing company. Competition in manufacturing and long distance is thriving on both sides of the border even if the United States now appears to be lagging in the growth of competition in long distance. Had antitrust authorities focused their attention on the actions of state or provincial authorities years ago, competition in local services might also be a reality today.

H. Two Other Single-Firm Cases

I began this Article with a review of section 2 cases in which the government achieved a consent decree or a court finding against the defendants. Of 423 such cases, only three or four involved single-firm monopolization not achieved through a series of mergers. Of these, I have reviewed only United Shoe Machinery and AT&T. One of the interesting lessons of section 2 case law is that the most important cases usually involved monopolization through merger.

There remain two single-firm cases that I have not analyzed in depth: IBM (1952) and Kansas City Star (1953). Neither of these cases would qualify for "landmark" status, and there is very little in the economics literature on them.

1. IBM

The 1952 section 2 case against IBM has many similarities to the United Shoe Machinery case. IBM dominated the "tabulating machine" business and the related business of tabulating cards, or "punch cards," long before the commercial development of the computer. The Justice Department filed suit against IBM in 1952, alleging that it had achieved monopoly power in tabulating machines through its lease - only policy and a restrictive [*193] patent policy. n219 In addition, IBM allegedly enjoyed monopoly power in tabulating cards, which it maintained in part through discriminatory pricing.

IBM settled the case in 1956 by agreeing to sell some rotary presses and to end its discriminatory pricing. n220 In addition, it had to divest some of its card manufacturing capacity if it did not reduce its share of this market to 50% by 1962. Because it only reduced its share to 53% by the required date, some divestiture was required. In addition, the decree required IBM to set up a separate "service bureau" through which it offered service to customers who did not lease or own tabulating machines. This service bureau was subsequently sold to Control Data Corporation to settle a private suit.

Obviously, by 1962 the computer was rapidly replacing tabulating machines. Although the decree led to greater competition in tabulating cards, at least one student of the decree claims that it was a failure because the new firms failed to achieve sustainable profits. n221 Furthermore, there is little evidence that this antitrust action had any favorable effects on competition in the computer industry, which was already beginning to replace tabulating machines in 1956, when the decree was signed. n222 Indeed, IBM quickly vaulted to a dominant position in mainframe computers during this period, leading the Justice Department to file another section 2 case against it in 1969. This latter case was eventually dropped in 1982, in no small part because the market had changed once again. n223

If there is a lesson in these antitrust actions against IBM it is that the federal antitrust actions were far behind market developments. The replacement of tabulating machines by computers was underway when IBM settled the first case, and IBM was losing its market power in computers in the 1969-1982 period to upstart firms offering mini-computers and personal computers. [*194] Competitive forces eroded IBM's position, leaving antitrust at the gate.

2. Kansas City Star

The Kansas City Star case involved both criminal and civil complaints under the Sherman Act brought in 1953 that alleged monopolization and attempts to monopolize the news and advertising markets in the Kansas City metropolitan area. n224 Most of the charges involved exclusive dealing, tying arrangements and discriminatory pricing across the Star's newspapers in the 1930s. However, the government also alleged tying arrangements between the Star's newspapers and its broadcasting stations in Kansas City, WDAF and WDAF-TV. Cross-ownership of media has been a major issue with the Federal Communications Commission for decades, but the Kansas City Star case antedates even the Commission's lengthy record on the issue.

a. The Antitrust Case

The Kansas City Star newspapers had obtained a dominant position in the dissemination of news and advertising in the Kansas City area through a variety of pricing policies and acquisitions throughout the first half of the twentieth century. By 1953, the Star's three newspapers - one daily morning edition, one daily evening edition, and a single Sunday newspaper - averaged about 360,000 in circulation. The nearest competitor, across the river in Kansas, had less than 28,000 in daily circulation. The lower court refused to admit evidence on the degree to which national publications or newspapers in adjacent markets competed for readership and advertising with the Star's papers. Therefore, the data on Kansas City dailies' circulation provided essentially un rebutted evidence of the Star's market power. n225

The government alleged that earlier competitors had been vanquished through a variety of anticompetitive practices. In particular, advertisers were required to purchase "combination" advertising in the Star's morning and evening papers. Television advertisers were required to advertise in the Star's newspapers to [*195] gain access to WDAF-TV. Predatory pricing - "depression discounts" - drove its principal newspaper rival from the market, and once this rival exited, prices were raised.

The case was developed and filed during the last days of the Truman administration, but litigated during the Eisenhower administration. Allegations of political influence surrounded the

case, especially when the criminal charges against the Star's president were dropped on the eve of trial. The government won the criminal case against the Star and one of its executives, but the judge levied fines of only \$ 7,500 against the two defendants.

The civil case was never litigated because the Star and the government entered negotiations to settle the case shortly after the Star lost its appeals of the criminal case in the Court of Appeals for the Eighth Circuit and the Supreme Court denied certiorari. n226 Five months later, a consent decree was entered that forbade discrimination in advertising, tying arrangements in advertising or subscription sales, and discrimination in credit policies with advertisers. n227 While the government had asked that the Star's broadcast licenses be revoked, the consent decree simply required the Star to sell them and transfer the licenses. Thereafter, the Star was forbidden to acquire any other newspaper or broadcaster in the Kansas City area.

b. The Effects of the Decree.

There is very little evidence available on the decree's effect on the newspaper business in Kansas City. The 1950s began a lengthy period of consolidation of the newspaper industry throughout the country as consumers turned increasingly to television for their news and other information. The consent decree had little apparent effect on the concentration in local newspapers in Kansas City, but it is probably naive to have expected such an effect in the ensuing period of rapid growth of the television industry. Four years after the decree was entered, the three Star newspapers still averaged about 348,000 in circulation, and the other dailies totaled just 43,000. Between 1957 and 1961, the Star newspapers had declined from 348,000 to 339,000 in circulation, while the competitors had fallen from 47,000 to 43,000. n228 [*196] However, the price of a subscription to the Star papers remained constant in real terms between 1953 and 1960, but increased thereafter. The Star's combined daily advertising rate rose by 51.6% and its Sunday rate rose by 53.8% between 1953 and 1969, compared to a 37% increase in the consumer price index. n229 Obviously, these increases do not constitute convincing evidence that the Star's market power was unaffected by the decree given the likely changes in costs and the availability of competitive media. However, by themselves, the available data certainly do not suggest that the decree improved competition among news and advertising media in Kansas City.

III

Is Monopoly a Serious Problem in the United States?

This review of section 2 monopolization cases surely casts doubt on the ability of antitrust officials and the courts to design remedies for markets found to have been illegally monopolized. Moreover, such cases involving single-firm monopoly are exceedingly rare; most successful monopolization suits are brought against firms who have attained their market position through merger or various price-fixing or market-sharing agreements. One possible explanation for both the paucity of cases and the absence of obvious consumer-welfare-enhancing results is that monopoly power is simply not a very large problem in the United States.

Beginning with Arnold Harberger's seminal work, n230 a number of empirical studies suggest that the total cost of monopoly is very small indeed. Harberger found that the social cost of monopoly is only 0.1% of gross national product. More recent studies place the loss between 0.02%

and 13.1% but the higher-end estimates include estimates of the advertising costs that allegedly result from monopoly power. Without including advertising as a source of loss of economic welfare due to monopoly, the estimates of the social cost of monopoly are 4% of Gross Domestic Product (GDP) or less. n231

If monopoly is not much of a problem in the first place, it is understandable that section 2 cases are rare and section 2 remedies are not very effective. On the other hand, section 2 may provide a strong disincentive for firms to obtain monopoly power, given the cost of defending an antitrust suit.

Conclusion

This review of the major section 2 Sherman Act cases won by the government or ending in consent decrees provides remarkably little evidence that these cases and the relief that emanated from them had a positive effect on competition and consumer welfare. In some cases, such as Standard Oil (1911) and IBM (1956), this ineffectiveness was due to the fact that market forces were changing rapidly, thereby reducing the defendant firms' market power anyway. In at least three others, American Tobacco (1911), Alcoa (1945), and Paramount (1948), the relief simply did not generate an increase in price competition. In American Tobacco and Alcoa, the substitution of a three-firm oligopoly for a single firm did not have a measurable effect on prices. In Paramount, prices actually rose after the forced vertical divestitures, but this result is clouded by the enormous changes wrought by the substitution in the 1950s of television for motion picture theater admissions. Similarly, the protracted relief obtained by the government in United Shoe Machinery (1953) over more than fifteen years was surely overwhelmed by the development of foreign competition in shoe manufacturing, but there is no evidence that shoe machinery prices were reduced very much by the first decree. Nor can one find evidence that the vertical divestiture in Kansas City Star (1958) or the limitations on television network program "ownership" and production in the 1980s had any beneficial effects on competition. Indeed, the network decrees appear to have reduced competition by eliminating three competitors from the syndication market.

The exception in this analysis is the 1982 AT&T decree that broke up AT&T, a monopoly created by government regulation. However, the vertical divestiture could have been avoided through a simple regulatory policy of requiring equal access, a policy that the FCC failed to adopt. The continuing problems of [*198] rationalizing and reintegrating the U.S. telecommunications sector could have been avoided had the FCC adopted such policy as Canada and the EU have implemented more recently. Therefore, this antitrust success in correcting a market failure was, in reality, the correction of an earlier government failure.

The important lessons to be learned from this review of the history of section 2 cases is that the government often lags the market in finding ways to increase competition, rendering antitrust cases redundant. In other cases, the government failed to formulate relief that resulted in any meaningful change in competition because it failed to grasp the essentials of the market that led to concentration in the first place. This is particularly true for markets gripped by rapid technological change, such as computers or the distribution of video programming. Given the rapid pace of technical progress that we are encountering as we enter the twenty-first century, there is surely little prospect that section 2 will be employed more productively in the future than it has been in the past.

FOOTNOTES:

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n2. *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982) aff'd sub. nom., *Maryland v. United States*, 460 U.S. 1001 (1983).

n3. *Standard Oil Co. of N.J. v. United States*, 221 U.S. 1 (1911).

n4. *United States v. Am. Tobacco Co.*, 221 U.S. 106 (1911).

n5. *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

n6. *United States v. Paramount Pictures*, 334 U.S. 131 (1948).

n7. *United States v. United Shoe Mach. Corp.*, 110 F. Supp. 295 (D. Mass. 1953), aff'd, 347 U.S. 521 (1954).

n8. *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), aff'd sub. nom., *Maryland v. United States*, 460 U.S. 1001 (1983).

n9. Phillip Areeda, *Antitrust Analysis: Problems, Texts, Cases* (1988).

n10. *Aluminum Co. of Am.*, 148 F.2d at 430.

n11. *United Shoe Mach. Corp.*, 110 F. Supp. 295.

n12. See *infra* Section II.D.

n13. *United States v. IBM*, 477 F. Supp. 698 (S.D.N.Y. 1979).

n14. For a discussion of the futility of the government's case, see Franklin M. Fisher et al., *Folded, Spindled, and Mutilated: Economic Analysis and U.S. v. IBM* (1983).

n15. See *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982).

n16. See F.M. Scherer, *Innovation and Growth: Schumpeterian Perspectives* ch. 10 (1984).

n17. See Paul H. Rubin, *What Do Economists Think About Antitrust?: A Random Walk Down Pennsylvania Avenue*, in *The Causes and Consequences of Antitrust: The Public Choice Perspective* 33 (Fred S. McChesney & William F. Shughart II eds., 1995).

n18. Another thirty-four met the criteria, but the Abstracts contained insufficient information to complete the categorization of them.

n19. See Carl Kaysen, *United States v. United Shoe Machinery Corporation: An Economic Analysis of an Anti-Trust Case 272-75* (1956).

n20. Malcolm R. Burns, *The Competitive Effects of Trust-Busting: A Portfolio Analysis*, 85 *J. Pol. Econ.* 717 (1977).

n21. I examine this case in detail below.

n22. Ideally, an analysis of the effects of a decree should include the effects on the productive efficiency of the defendant firm and others in the industry. If the decree causes a sacrifice of economies of scale, the reduced productive efficiency should be weighed against any increase in consumer welfare due to lower prices. In this survey, I do not attempt to conduct such an analysis of every case, focusing instead on whether the decrees had any measurable beneficial impact on prices and output.

n23. Harold F. Williamson & Arnold R. Daum, 1 *The American Petroleum Industry: The Age of Illumination 1859-1899*, at 302 (1959).

n24. Harold F. Williamson et al., 2 *The American Petroleum Industry: The Age of Energy 1899-1959*, at 9 (1963). (A "partial list" of state suits against Standard includes twenty actions filed in 1904-1906.)

n25. *Id.* at 17.

n26. *Id.*

n27. U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition 593-94* (U.S. Dep't of Commerce ed., 1975) [hereinafter U.S. Bureau of the Census]; Williamson, et al., *supra* note 25, at 168.

n28. *Id.*

n29. Among the charges in the 1906 Standard Oil case was that Standard denied common carriage on its pipelines to small independent refiners.

n30. Williamson et al., *supra* note 25, at 64-109.

n31. *Id.* at 7.

n32. U.S. Bureau of the Census, *supra* note 27, at 593-94.

n33. Williamson et al., *supra* note 25, at 172.

n34. *Id.* at 10.

n35. The government's case contained elements of all four of these complaints. See *United States v. Standard Oil of N.J.*, 173 F. 177, 190 (C.C.E.D. Mo. 1909), *aff'd as modified*, 221 U.S. 1 (1911).

n36. John S. McGee, *Predatory Price Cutting: The Standard Oil (N.J.) Case*, 1 *J.L. & Econ.* 137 (1958). McGee provides a cogent argument that Standard did not attain its market position through predatory prices, but rather by simply acquiring rivals in large numbers. He does not dispute, however, that Standard may have used exclusionary practices with respect to its transportation facilities.

n37. It is not clear why such "profit pools" were viewed with such hostility if they were indeed simply the pooling of profits within a single entity - the Standard Oil Trust.

n38. *Standard Oil*, 173 F. 177.

n39. *Standard Oil Co. of N.J. v. United States*, 221 U.S. 1 (1911).

n40. All of these data are from Williamson et al., *supra* note 25, at 7.

n41. Id.

n42. Standard Oil, 221 U.S. at 76-77.

n43. Id. at 76.

n44. Standard Oil, 173 F. at 197 (C.C.E.D. Mo. 1909), aff'd as modified, 221 U.S. 1 (1911).

n45. Standard Oil, 221 U.S. at 77-81.

n46. Id. at 80-81.

n47. Melvyn G. DeChazeau & Alfred E. Kahn, *Integration and Competition in the Petroleum Industry* 87 (1959).

n48. All prices are deflated by the GNP deflator (1958=100). Data for crude oil production and prices are available in U.S. Bureau of the Census, *supra* note 27, at 593. Crude oil production is in thousand barrel units. Crude oil prices per barrel are in units of 1958 dollars. Real GNP and the GNP deflator are available from the U.S. Bureau of the Census, *supra* note 27, at 224. Real GNP is in billion 1958 dollars. Automobile registrations are in thousand units and are available from the U.S. Bureau of the Census, *supra* note 27, at 716. Electricity production is in units of million kilowatt-hours and is available from the U.S. Bureau of the Census, *supra* note 27, at 821. Missing values for electricity production were interpolated by fitting a power function to the existing data points from 1902 to 1934.

n49. A similar analysis of the determinants of gasoline and kerosene prices would have been informative, but annual data on these prices are not available for the requisite time period.

n50. These coefficients are statistically significant when electricity capacity is substituted for electricity production in these two equations.

n51. Burns, *supra* note 20, at 732-33.

n52. Id. at 717-39.

n53. Id.

n54. In this analysis and those reported below for the other cases, I estimate a standard Capital Asset Pricing Model of the form $r_{it} = [\alpha] + [\beta] R_{t} + u_{it}$ where r_{it} is the return to stockholders of the i th company's equity (capital gains plus dividends divided by the value of the common equity at the beginning of the period) in period t , R_{t} is the return to the entire market (Dow Jones Average) in period t , and u_{it} is a random error term. The Capital Asset Pricing Model is estimated for the period prior to the filing of the case, and the estimate from this regression is used to generate predicted values of r for the event windows in the case. The residuals are simply the actual return less the predicted return.

n55. See Richard A. Brealey & Stewart C. Meyers, *Principles of Corporate Finance* 180 (McGraw-Hill, 5th ed. 1996).

n56. Williamson et al., *supra* note 25, at 12-13.

n57. These data are derived from Williamson et al., *supra* note 25, at 7, 166.

n58. One historian, Joseph A. Pratt, advances the theory that it was Texas antitrust law that prevented Standard from expanding its market power into the Gulf area. Joseph A. Pratt, *The Petroleum Industry in Transition: Antitrust and the Decline of Monopoly Control in Oil*, 40 *J. Econ.*

Hist. 815, 815-37 (1980). I do not address his theory in this paper because it is not germane to my inquiry into the effects of federal antitrust actions. However, Pratt does not explain how Texas antitrust law could have affected Standard's behavior in other Gulf, Mid-Continent, and western states.

n59. Richard B. Tennant, *The American Cigarette Industry: A Study in Economic Analysis and Public Policy* 27 (1950).

n60. *Id.* at 28-29.

n61. *Id.*

n62. *N. Sec. Co. v. United States*, 193 U.S. 197 (1904).

n63. *United States v. Am. Tobacco Co.*, 164 F. 700 (C.C.S.D.N.Y. 1908), rev'd, 221 U.S. 106 (1911).

n64. *United States v. Am. Tobacco Co.*, 221 U.S. 106, 187 (1911).

n65. *United States v. Am. Tobacco Co.*, 191 F. 371, 375 (C.C.S.D.N.Y. 1911).

n66. Tennant, *supra* note 60, at 61.

n67. *Am. Tobacco*, 191 F. at 377-80.

n68. *Id.*, quoted in Tennant, *supra* note 60, at 65.

n69. Tennant, *supra* note 60, at 70.

n70. *Id.* at 71 tbl.12.

n71. *Id.* at 85.

n72. U.S. Bureau of the Census, *supra* note 27, at 224, 699.

n73. Tennant, *supra* note 60, at 96, 346.

n74. U.S. Bureau of the Census, *supra* note 27, at 517.

n75. *Id.* at 211.

n76. Malcolm R. Burns, *An Empirical Analysis of Stockholder Injury Under 2 of the Sherman Act*, 31 *J. Indus. Econ.* 333 (1983).

n77. This description of the early aluminum industry is derived mainly from Merton J. Peck, *Competition in the Aluminum Industry 1945-1958* (1961); Simon N. Whitney, *2 Antitrust Policies: American Experience in Twenty Industries* (1958); and Margaret B.W. Graham & Bettye H. Pruitt, *R&D for Industry: A Century of Technical Innovation at Alcoa* (1990).

n78. Whitney, *supra* note 77, at 86.

n79. Donald H. Wallace, *Market Control in the Aluminum Industry* 24 (1937).

n80. U.S. Bureau of the Census, *supra* note 27, at 605.

n81. *Id.* at 695.

n82. Wallace, *supra* note 80, at 194.

n83. *Id.* at 226.

n84. Whitney, *supra* note 78, at 90.

n85. *United States v. Aluminum Co. of Am.*, Eq. 159 (W.D. Pa. 1912), cited in Whitney, *supra* note 77, at 86-87 (decree in Decrees and Judgments in Federal Anti-trust Cases 341-50 (U.S. Dep't of Justice ed., 1918), and in Wallace, *supra* note 79, at 547-55).

n86. See *id.*

n87. *Aluminum Co. of Am.*, 3 F.T.C. 302 (1921); *Aluminum Co. of Am. v. FTC*, 284 F. 401 (3d Cir. 1922).

n88. *Aluminum Co. of Am. v. FTC*, 299 F. 361 (3d Cir. 1924).

n89. *Kitchen Furnishings and Domestic Appliances*, in 3 Fed. Trade Comm'n, *Report on House Furnishings Industries* xxxii (1924).

n90. S. Doc. No. 69-67 (1926).

n91. *Aluminum Co. of Am.*, 13 F.T.C. 333 (1930).

n92. *United States v. Aluminum Co. of Am.*, 44 F. Supp. 97 (S.D.N.Y. 1941), *aff'd in part and rev'd in part*, 148 F.2d 416 (2d Cir. 1945).

n93. *Id.*

n94. Whitney, *supra* note 77, at 89.

n95. *Id.*

n96. See *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

n97. *Id.*

n98. A lively literature developed over this issue. See Darius W. Gaskins, Jr., *Alcoa Revisited: The Welfare Implications of a Second-Hand Market*, 7 *J. Econ. Theory* 254, 254-71 (1974); Franklin M. Fisher, *Comment, Alcoa Revisited*, 9 *J. Econ. Theory* 357, 357-59 (1974).

n99. *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

n100. Whitney, *supra* note 77, at 93.

n101. *Id.*

n102. *Id.*

n103. *Aluminum Co. of Am.*, 148 F.2d 416.

n104. Germany had become the world's largest producer of aluminum when World War II began in 1939. By itself, Alcoa could not afford to expand sufficiently its operations to meet the emergency demands of the Allied powers. See George David Smith, *From Monopoly to Competition: The Transformation of Alcoa 1888-1986*, at 191-92 (1988).

n105. Whitney, *supra* note 78, at 95.

n106. *Id.* at 97-98.

n107. *Id.* at 98.

n108. *Id.* at 98 n.48.

n109. Id. at 98.

n110. Id.

n111. *United States v. Aluminum Co. of Am.*, 91 F. Supp. 333 (S.D.N.Y. 1950).

n112. Whitney, *supra* note 77, at 99.

n113. Id.

n114. Id. at 99-100.

n115. *United States v. Aluminum Co. of Am.*, 153 F. Supp. 132 (S.D.N.Y. 1957).

n116. Peck, *supra* note 78, at 148-50.

n117. Aluminum Ass'n, *Aluminum Industry Annual Statistical Review* 12-13 (1965).

n118. Peck, *supra* note 78, at 176-78.

n119. All prices are deflated by the GNP deflator (1958=100). Data for the prices of primary aluminum and imported bauxite were obtained from the Minerals Information Team of the U.S. Geological Survey. Prices of primary aluminum are in units of 1958 dollars per pound. Prices of imported bauxite are in units of 1958 dollars per short ton. Real GNP and the GNP deflator are from U.S. Bureau of the Census, *supra* note 27, at 224. Real GNP is in billion 1958 dollars. Steel prices are from U.S. Geological Survey, U.S. Dep't of the Interior, *Metal Prices in the United States Through 1998*, at 63, available at http://minerals.usgs.gov/minerals/pubs/metal_prices/. Steel prices are in units of 1958 dollars per short ton. Electricity prices are from U.S. Bureau of the Census, *supra* note 27, at 827, and are in units of 1958 cents per kilowatt-hour.

n120. The information in this section is derived from Michael Conant, *Antitrust in the Motion Picture Industry: Economic and Legal Analysis* (1960).

n121. Id. at 94; *United States v. Paramount Pictures, Inc.*, 334 U.S. 131 (1948).

n122. Conant, *supra* note 120, at 94.

n123. See *United States v. Interstate Circuit*, 20 F. Supp. 868, 874 (N.D. Tex. 1937), *aff'd*, 306 U.S. 208 (1939); *United States v. Crescent Amusement Co.*, 323 U.S. 173 (1944); *United States v. Griffith*, 334 U.S. 100 (1948); *Schine Chain Theatres v. United States*, 334 U.S. 110 (1948).

n124. Conant, *supra* note 120, at 94; *United States v. Paramount Pictures, Inc.*, 334 U.S. 131 (1948).

n125. Conant, *supra* note 120, at 95-96.

n126. *United States v. Paramount Pictures, Inc.*, 70 F. Supp. 53, 72-76 (S.D.N.Y. 1946), *aff'd in part and rev'd in part*, 334 U.S. 131 (1948).

n127. Id. at 75-76.

n128. Id. at 73.

n129. Id.

n130. *United States v. Paramount Pictures, Inc.*, 334 U.S. 131 (1948).

n131. Conant, *supra* note 120, at 175.

n132. *Id.* at 177-78.

n133. *United States v. Loew's, Inc.*, 1950-51 Trade Cas. (CCH) P 62,765 (S.D.N.Y. 1951) (Warner consent decree); *United States v. Loew's, Inc.*, 1950-51 Trade Cas. (CCH) P 62,861 (S.D.N.Y. 1951) (Twentieth Century-Fox consent decree); *United States v. Loew's, Inc.*, 1952-53 Trade Cas. (CCH) P 67,228 (S.D.N.Y. 1952) (Loew's consent decree). These consent decrees are cited in Conant, *supra* note 121, at 103.

n134. Conant, *supra* note 120, at 177-78.

n135. *Id.*

n136. Census of Service Industries (U.S. Bureau of the Census ed., 1958).

n137. Census of Service Industries (U.S. Bureau of the Census ed., 1967).

n138. Much of the discussion of the motion-picture industry after Paramount is derived from Robert W. Crandall, *The Postwar Performance of the Motion Picture Industry*, 20 *Antitrust Bull.* 49, 49-88 (1975).

n139. *Id.*; U.S. Bureau of the Census, *supra* note 27, at 210.

n140. Crandall, *supra* note 139.

n141. *Id.*

n142. All of these data are from Crandall, *supra* note 139.

n143. Arthur De Vany & Ross D. Eckert, *Motion Picture Antitrust: The Paramount Cases Revisited*, in 14 *Research in Law and Economics* 51 (Richard O. Zerbe, Jr. & Victor P. Golberg eds., 1991).

n144. Kaysen, *supra* note 19, at 6.

n145. *Id.* at 9.

n146. *Id.* at 3.

n147. *Id.*

n148. *Id.*

n149. *United States v. United Shoe Mach.*, 110 F. Supp. 295 (D. Mass. 1953), *aff'd*, 391 U.S. 244.

n150. *United States v. United Shoe Mach. Corp.*, Civil Action No. 7198, 1969 U.S. Dist. LEXIS 13280, at 1 (D. Mass. Feb. 20, 1969).

n151. Scott E. Masten & Edward A. Snyder, *United States vs. United Shoe Machinery Corporation: On the Merits*, 36 *J.L. & Econ.* 33, 38 (1993).

n152. Kaysen, *supra* note 19, at 27.

n153. *Id.*

n154. Masten & Snyder, *supra* note 152, at 35.

n155. Several different analyses were performed to determine the market share of USM and its competitors. The results below are taken from Kaysen, *supra* note 19, at 6. The specific results cited

by Kaysen are from the government's Summary of Depositions, which included a study of forty-five shoe manufacturers canvassed in 1949. See Kaysen, *supra* note 19, at 45, 52. Also note that the percentage of market share for "Other Competitors" was calculated by subtracting the sum of the market shares of major machines for United, Compo, and International from one hundred percent. For minor machines, the market shares of United, Boston Machine Works, and Compo were summed and subtracted from one hundred percent to determine the market share of other competitors.

n156. Kaysen, *supra* note 19, at 53.

n157. Masten & Snyder, *supra* note 152, at 57.

n158. *Id.*

n159. Kaysen, *supra* note 19, at 74.

n160. *Id.* at 89.

n161. *Id.* at 92.

n162. *United States v. United Shoe Mach. Corp.*, 110 F. Supp. 295 (D. Mass. 1953), *aff'd*, 347 U.S. 521 (1954).

n163. *United Shoe Mach. Corp. v. United States*, 347 U.S. 521 (1954).

n164. Kaysen, *supra* note 19, at 272-73.

n165. *United Shoe Mach. Corp.*, 110 F. Supp. at 348.

n166. *Id.* at 352.

n167. *Id.*

n168. *Id.*

n169. *Id.* at 354.

n170. *United Shoe Mach. Corp. v. United States*, 347 U.S. 521 (1954).

n171. Gordon Odell Parrish, *The Experience with Antitrust Relief in Shoe Machinery* 142 (1973) (unpublished Ph.D. dissertation, Washington State University) (on file with author).

n172. Don E. Waldman, *Antitrust Action and Market Structure* 47 (1978); *United States v. United Shoe Mach. Corp.*, 391 U.S. 244, 249-53 (1968) (Finding of Fact No. 2).

n173. Parrish, *supra* note 172, at 107 (citations omitted).

n174. *Id.* at 97.

n175. *Id.* at 138.

n176. *Id.* at 161.

n177. Waldman, *supra* note 173, at 47.

n178. *Id.*

n179. Data from the quinquennial Census of Manufactures, published by the U.S. Bureau of the Census.

n180. See *infra* Section II.E.6.

n181. Masten & Snyder, *supra* note 152, at 66-67.

n182. *Id.* at 66.

n183. *United States v. United Shoe Mach. Corp.*, 266 F. Supp. 328 (D. Mass. 1967), *rev'd*, 391 U.S. 244 (1968).

n184. *United States v. United Shoe Mach. Corp.*, 391 U.S. 244 (1969).

n185. See Robert W. Crandall, *The Economic Case for a Fourth Commercial Television Network*, 22 *Pub. Pol'y* 513, 513-36 (1974).

n186. Office of Network Inquiry, Fed. Communications Comm'n, *Television Network Program Procurement*, H.R. Rep. No. 88-281 (1963); Office of Network Inquiry, Fed. Communications Comm'n, *Television Network Program Procurement pt. 2* (1965).

n187. The cases were *United States v. ABC*, Civ. Compl. No. 72-819-RJK (C.D. Cal. filed 1972), *United States v. CBS*, Civ. Compl. No. 72-920-RJK (C.D. Cal. filed 1972); and *United States v. NBC*, Civ. Compl. No. 72-821-RJK (C.D. Cal. filed 1972) [*hereinafter* Civil Complaints].

n188. A thorough discussion of network program production, acquisition, and distribution may be found in 1 Fed. Communications Comm'n, *Final Report, New Television Networks: Entry, Jurisdiction, Ownership, and Regulation* (1980) [*hereinafter* FCC Special Staff Report].

n189. 2 *id.*

n190. For details of these rules, see *id.*

n191. *Civil Complaints*, *supra* note 186.

n192. NBC entered into a decree in 1977, and CBS and ABC both followed in 1980. *United States v. NBC*, 1978-1 *Trade Cas. (CCH)* P 61,855 (C.D. Cal. 1977); *United States v. CBS*, 1980-81 *Trade Cas. (CCH)* P 63,594 (C.D. Cal. 1980); *United States v. ABC*, 1981-1 *Trade Cas. P* 64,150 (C.D. Cal. 1980).

n193. Critical analyses of the assumption that networks had monopsony power may be found in Robert W. Crandall, *FCC Regulation, Monopsony, and Network Television Program Costs*, 3 *Bell J. Econ. & Mgmt. Sci.* 483, 483-508 (1972), and Franklin M. Fisher, *The Financial Interest and Syndication Rules in Network Television: Regulatory Fantasy and Reality*, in *Antitrust and Regulation: Essays in Memory of John J. McGowan* 263 (Franklin M. Fisher ed., 1985).

n194. See 2 FCC Special Staff Report, *supra* note 189, at 736-41.

n195. *United States v. NBC*, 449 F. Supp. 1127 (C.D. Cal. 1978), *aff'd*, 603 F.2d 227 (9th Cir. 1979); *United States v. ABC*, Proposed Final Judgment and Competitive Impact Statement, 45 *Fed. Reg.* 58,442 (Sept. 3, 1980); *United States v. CBS*, Proposed Final Judgment and Competitive Impact Statement, 45 *Fed. Reg.* 34,463 (May 22, 1980).

n196. These data are derived from Robert W. Crandall, *The Economic Case Against the FCC's Television Network Financial Interest and Syndication Rules tbl.V.2* (1990) (on file with author) (submitted in *In re Evaluation of the Syndication and Financial Interest Rules*, 5 F.C.C.R. 1815 (1990)).

n197. *Id.* at tbl.V.1.

n198. *Id.* at 31.

n199. Bruce M. Owen & Steven S. Wildman, *Video Economics* ch. 5 (1992).

n200. See, for example, the analysis of the FCC's Network Inquiry Special Staff in FCC Special Staff Report, *supra* note 189; Fisher, *supra* note 194; and Owen & Wildman, *supra* note 200.

n201. This discussion of the early history of the U.S. telephone industry is based principally on Gerald W. Brock, *The Telecommunications Industry: The Dynamics of Market Structure* (1981).

n202. The Willis-Graham Act of 1921 exempted telephone mergers from the antitrust laws.

n203. Robert W. Crandall & Leonard Waverman, *Who Pays for Universal Service? When Telephone Subsidies Become Transparent* (2000).

n204. *MCI Telecomms. Corp. v. FCC*, 561 F.2d 365 (D.C. Cir. 1977); *MCI Communications v. FCC*, 580 F.2d 590 (D.C. Cir. 1978).

n205. *N.C. Utils. Comm'n v. FCC*, 537 F.2d 787 (4th Cir. 1976).

n206. *United States v. W. Elec.*, Civ. Action No. 17-49, C.A. 82-0192 (D.N.J. Jan. 24, 1956).

n207. These cases included *MCI Communications Corp. v. AT&T*, 708 F.2d 1081 (7th Cir. 1983); *Southern Pacific Communications Co. v. AT&T*, 556 F. Supp. 825 (D.D.C. 1982), *aff'd*, 740 F.2d 980 (D.C. Cir. 1984); and *Mid-Texas Communications Systems Inc. v. AT&T*, 615 F.2d 1372 (5th Cir. 1980).

n208. *United States v. AT&T*, Civ. Action No. 74-1698 (D.D.C. filed Nov. 20, 1974).

n209. *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982).

n210. *United States v. W. Elec.*, 951 F.2d 1324 (D.C. Cir. 1991).

n211. See Michael K. Kellogg et al., *Federal Telecommunications Law* 65 (1992) for a thorough discussion of these problems.

n212. 47 U.S.C. 271 (Supp. 1997).

n213. Long-distance carrier revenues do not include the long-distance revenues of local exchange companies, but the local Bell companies did not compete outside of their LATAs because of the decree, and other local companies did not offer interLATA service to any major extent. Thus, the concentration of long distance carrier revenues provide a good measure of market concentration in the interLATA market, which accounts for about three-fourths of all long distance service.

n214. Fifth Report on the Implementation of the Telecommunications Regulatory Package: Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, Eur. Parl. Doc. (COM 99) 537, final at 151, annex 4.2.

n215. *Id.*

n216. B. Douglas Bernheim and Robert D. Willig make this argument in *The Scope of Competition in Telecommunications* (1996) (draft for the American Enterprise Institute).

n217. All rates are taken from the FCC's *Statistics of Communications Common Carriers* annual editions. They are residential rates deflated by the overall Consumer Price Index.

n218. Robert W. Crandall, *After the Breakup: U.S. Telecommunications in a More Competitive Era* ch. 6 (1991).

n219. Complaint, *United States v. IBM*, Civ. Action No. 72-344 (S.D.N.Y. filed 1952).

n220. *United States v. IBM*, 1956 Trade Cas. (CCH) P 68,245 (S.D.N.Y. 1956).

n221. Waldman, *supra* note 173, at 141.

n222. See Ronald P. Wilder, *The Electronic Data Processing Industry: Market Structure and Policy Issues*, *Antitrust Bull.* 25-47 (1975). Wilder views the service-bureau provision of the decree as a mild success.

n223. For a scathing critique of the government's 1969 case, see Fisher et al., *supra* note 14.

n224. *United States v. Kansas City Star Co.*, Criminal No. 18444 & Civ. No. 7989 (W.D. Mo. filed Jan. 6, 1953).

n225. These data are from Lorry Elbon Rytting, *United States of America v. Kansas City Star: An Antitrust Case Study* (1969) (unpublished Ph.D. dissertation, University of Wisconsin) (on file with author).

n226. *Kansas City Star Co. v. United States*, 240 F.2d 643 (8th Cir. 1957).

n227. *Kansas City Star Co. v. United States*, 1957 Trade Cas. (CCH) P 68,857 (W.D. Mo. 1957).

n228. Rytting, *supra* note 226, at 194.

n229. *Id.* at 296-300; Bureau of Labor Statistics, U.S. Dep't of Labor, *Consumer Price Index, 1953-1969*.

n230. Arnold C. Harberger, *Monopoly and Resource Allocation*, *Papers and Proceedings*, *Am. Econ. Rev.*, 77, 77-87 (1954).

n231. For a review of these estimates, see Paul R. Ferguson & Glenys J. Ferguson, *Industrial Economics: Issues and Perspectives* 94 (2d ed. 1994).