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**“An Elephants’ Graveyard”:
the Deregulation of American Industry
in the Late Twentieth Century**

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ABSTRACT

This paper is an excerpt from a larger book project called *The Corporation and the Twentieth Century*, which chronicles and interprets the institutional and economic history – the life and times, if you will – of American business in the twentieth century. This excerpt examines the era of industrial deregulation of the late twentieth century. As had been the case with financial deregulation, it argues, industrial deregulation and the internationalization of trade were largely a manifestation of the misalignment of the postwar regulatory regime with the realities of economic growth. This misalignment created profit opportunities for entrepreneurs not only in the realm of technology but also, and perhaps more crucially, in the realm of institutions. In some cases, entrepreneurs would expend resources in order to foment political change. In other cases, technological and institutional innovation, aided at times by the depredations of the regulation itself, would so reduce the available rents of a regulatory regime that its supporting coalition would collapse

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“Neoliberal” ideas would gain currency in Washington during the Reagan administration, though by that time almost all the era’s *de jure* deregulation had already taken place. One version of those ideas may even have been influential in the evolution of American antitrust policy. Those are stories that need to be told with some subtlety and nuance. On the whole, however, the deregulation and globalization of the late twentieth century was propelled by other forces. As had been the case with financial deregulation, industrial deregulation and the internationalization of trade were largely a manifestation of the misalignment of the postwar regulatory regime with the realities of economic growth. This misalignment created profit opportunities for entrepreneurs not only in the realm of technology but also, and perhaps more crucially, in the realm of institutions.¹ In some cases, entrepreneurs would expend resources in order to foment political change. In other cases, technological and institutional innovation, aided at times by the depredations of the regulation itself, would so reduce the available rents of a regulatory regime that its supporting coalition would collapse.² In Congress, the driving force behind industrial deregulation was not some neoliberal puppet but the senator who had most clearly inherited the mantle of postwar Progressivism, Edward M. Kennedy.³

It should come as no surprise that the major episodes of industrial deregulation in the United States took place during the 1970s, the decade that had also precipitated massive restructuring in less-regulated sectors. Indeed, the deregulation of the railroads, America’s first great modern industry, overlapped with the restructuring of the conglomerate. The

¹ This model of institutional change was advanced most clearly by Ruttan and Hayami (1984).

² Peltzman (1989, p. 33).

³ Derthick and Quirk (1985, pp. 66-67); Rothenberg (1994, p. 234).

signal event of the decade of deregulation would be the collapse of one particular conglomerate, the Penn Central Railroad, in what was then the largest bankruptcy in U. S. history.

As we saw, the rate-making principles of the Interstate Commerce Commission subsidized politically powerful bulk shippers at the expense of high-value-added industrial products. This had allowed the nascent trucking industry to cream-skim the higher-value-added (and generally smaller and lighter-weight) traffic. To combat this threat, during the New Deal the ICC began regulating trucking as well, restricting entry and controlling rates. Yet trucking continued to gain ground on the railroads, especially with the construction of the interstate highway system beginning in the 1950s. Railroad productivity measured in ton-miles per employee increased after the war, but far too slowly to keep up with the competition from trucking.⁴ The railroads implemented innovations like the diesel-electric locomotive and electronic switching, but they did so only slowly and belatedly, and it was the unregulated supplier firms like GM and GE that were the sources of most of that innovation. Railway unions, the oldest and among the strongest in the country, also fought innovation: famously, for decades after the coming of electricity, union rules required that railroads employ firemen, despite the absence of boilers to stoke. All trains were required to run with the full crews appropriate to the era before World War I. The ICC also played a major role in retarding innovation. In 1961, for example, the Southern Railroad invented a massive 100-ton hopper car for grain – four times larger than the standard car – that would lower costs by 60 per cent. The ICC refused to approve its use, on the grounds that

⁴ Saunders (2003, pp. 24-31).

it would hurt competitors. It took four years of litigation before the car was finally approved.

As had long been the case, the postwar railroads were starved for capital. The industry's regulated rate of return was so low that issuing stock was out of the question.⁵ Physical plant and equipment were deteriorating. The problems were worst in the northeast, where aging and outdated systems were more complex and in greater need of maintenance.⁶ Earlier than other parts of the country, the northeast was also moving away from heavy manufactured goods suitable for rail and towards services and high-value-added products. Increasingly, the automobile and the airplane, both the beneficiaries of federal infrastructure spending, were pushing passenger service into the red. Perhaps the hardest hit was the New York, New Haven and Hartford, long ago assembled by J. P. Morgan, which provided the main rail connections between New York and Boston and operated commuter trains to New York City. Plagued with bad management and buffeted by the Great Flood of 1955, the line was in bankruptcy in 1961. In 1965, the New Haven petitioned the ICC to discontinue all 273 of its interstate passenger trains – on the grounds that the system was in such poor shape that the trains were unsafe.⁷

Even the larger northeastern roads were having problems. This included the Pennsylvania Railroad, which Alfred Chandler had seen as the model for the rise of the modern managerial techniques of administrative coordination in the nineteenth and early

⁵ Salsbury (1982, p. 47).

⁶ Hiner (2006, pp. 38-39).

⁷ Saunders (1978, pp. 181-182).

twentieth centuries.⁸ By the postwar era, the company was way behind the times, largely because the ICC had frozen in place nineteenth-century accounting practices. During the 1950s, management made some headway in decentralizing the corporate structure along regional lines. And in the 1960s, as was *de rigueur*, the Pennsylvania Railroad became a conglomerate. In the beginning, this involved real estate development around the company's terminals, notably in Philadelphia and Chicago. In 1962, the railroad exchanged the air rights above its New York terminal for shares of the Madison Square Garden Corporation, whose patrons, the company hoped, would provide off-peak riders for its commuter trains. Building the new Madison Square Garden meant tearing down the magnificent Penn Station on the west side of Manhattan.⁹ In 1963, under its new CEO Stuart T. Saunders, the company acquired a one-third interest in the Buckeye Pipeline, an important supplier of jet fuel.¹⁰ The next year the Pennsy bought heavily into real estate, including land-development firms in Florida and California as well as a 60 per cent interest in the outfit creating the Six Flags amusement parks. The company then bought the Strick Holding Company, which made aluminum trailers and mobile homes. These purchases were carefully segregated into the Pennsylvania Company, which was kept separate from the regulated and impecunious Pennsylvania Transportation Company that ran the railroad.

⁸ Salsbury (1982).

⁹ The destruction of Penn Station led to the passage of a landmarks-preservation statute in New York. Thus when the Penn Central was plunging into bankruptcy, it was not allowed to sell the air rights above Grand Central Terminal, which it had hoped to turn into a skyscraper designed by Marcel Breuer. The case went all the way to the Supreme Court. *Penn Central Transportation Co. v. New York City*, 438 U.S. 104 (1978).

¹⁰ Sobel (1984, p. 170).

Beginning in the mid-1950s, the ICC came to see merger as the only solution to the railroad problem, and it effectively reversed the decades-long precedent of the *Northern Securities* case.¹¹ (Indeed, among the mergers approved was one creating the Burlington Northern, which united all the lines involved in *Northern Securities*.) By 1968, the ICC had approved 33 of the 38 merger applications presented to it. When he took over the Pennsylvania Railroad, Saunders inherited a proposed merger with the northeast's other great railroad, the New York Central, founded by Commodore Vanderbilt.¹² Even though the merger proposal had survived hearings by Senator Estes Kefauver and his antitrust subcommittee, in 1964 the Justice Department under Robert F. Kennedy opposed the merger on antitrust grounds. A compromise was eventually reached: the department would rescind its antitrust objections if the merged firm were to take over the dilapidated New Haven Railroad, which served the home constituency of the Kennedys. On April 27, 1966, Senator Edward M. Kennedy was able to announce to the people of New England that the New Haven would become part of a new Penn Central Transportation Company, which would officially come into existence in February 1968.¹³

Saunders became chairman of the board and Alfred E. Perlman of the New York Central became president and chief operating officer. Although major operational economies had been predicted, there had in fact been little pre-merger planning. Under Perlman's direction, the Central had been a more innovative, business-like, and top-down operation than the decentralized Pennsy. The very different organizational structures and

¹¹ Hiner (2006, p. 40).

¹² Saunders (1978).

¹³ Saunders (1978, pp. 199, 261).

business models of the two railroads proved refractory to amalgamation, and the Penn Central would be run by two different staffs in two different cities.¹⁴ Its end came swiftly. Penn Central stock that had been selling at more than \$71 in 1969 tumbled to \$12.75 by June 1970.¹⁵ The railroad was hemorrhaging cash, losing almost a \$1 million a day by 1972, the year in which it entered its extraordinarily complex bankruptcy.¹⁶ (It was only the Penn Central Transportation Company – the operating railroad – that was in bankruptcy, of course. The parent company, along with the holding company that had been the Pennsylvania Company, would go off to become a small and short-lived conglomerate.)

Fearing the economic and political fallout of such a huge bankruptcy, the Nixon administration wanted to provide the railroad with loans under the Defense Production Act, but the attempt fell apart.¹⁷ Talk of nationalization grew louder in Washington. And, indeed, the problem of the railroads was larger than the ICC and the bankruptcy courts were able to handle. Although the Penn Central collapse was more than merely the tip of the iceberg, many other railroads were also under water or nearly so. As one railroad historian put it (to switch metaphors abruptly), the eastern part of the U. S. was “a railroad graveyard.”¹⁸ Already in late 1970, Congress had attempted to solve the problem of passenger rail by creating the National Railroad Passenger Corporation – Amtrak – a for-profit corporation that has never made a profit in its more than 50 years of existence.¹⁹

¹⁴ Salsbury (1982, p. 140); Saunders (1978, p. 280).

¹⁵ Saunders (2003, p. 14).

¹⁶ Saunders (2003, pp. 46-50). Railroad cases came under Section 77 of the Bankruptcy Act, which gave the ICC wide discretion in sorting among claimants while keeping the roads running.

¹⁷ Hiner (2006, pp. 57-60); Saunders (1978, p. 293).

¹⁸ Saunders (1978, p. 295).

¹⁹ Hiner (2006, pp. 51-56).

Amtrak was given the non-commuter passenger operations of all the railroads, and it was placed under the jurisdiction of the Department of Transportation, not the ICC, from whose strictures it was largely made exempt.

The nationalization of the eastern freight roads would take a similar form. In an atmosphere of crisis, Congress passed the Regional Rail Reorganization (3R) Act in 1973, incorporating six (ultimately eight) of the bankrupt roads into the Consolidated Rail Corporation (Conrail).²⁰ The Act created the United States Railway Association, which was in part an RFC-like agency that could issue off-budget financing and loan guarantees and in part a planning agency to design the structure of Conrail.²¹ Because it did not and could not take into account technological innovation and other possibilities that might emerge with rate and exit deregulation, the agency's report leaned on the only available tool, consolidation and the abandonment of branch lines, to an extent that harkened back to the ideas of William Z. Ripley in the 1920s. With this report in hand, Congress passed the Railroad Revitalization and Regulatory Reform (4R) Act in 1976. Many, including Ralph Nader, were calling for the abolition of the ICC, which he described as “an elephants' graveyard of political hacks.”²² On the Senate floor, a Democrat from Delaware named Joseph Biden argued that it was time to get rid of all the regulatory agencies.²³ But the 4R Act would nod in only the vaguest ways at deregulatory ideas, concentrating instead

²⁰ Hiner (2006, pp. 95-111).

²¹ Saunders (1978, pp. 308-314).

²² Saunders (2003, p. 111).

²³ *Congressional Record*, 94th Congress, 1st Session, v. 122, pt. 2, 2245 (1976).

on the launch of Conrail, a Pennsylvania-chartered corporation owned by the federal government and capitalized at \$1.2 billion.²⁴

The push for genuine deregulation of the railroads would come from the Democratic Carter administration, spurred as much by the realities of owning a railroad regulated by the ICC as by a taste for deregulation. Out of the gate Conrail was losing more than \$30 million a quarter, even as measured by its own forgiving accounting principles. Brock Adams, Carter's transportation secretary, quickly proposed a bill that would have effectively done away with the ICC. Under pressure from those shippers who had little choice among routes – though with the support of many other shippers who foresaw lower rates – Congress forged a compromise.²⁵ The Staggers Rail Act of 1980 (named after West Virginia Democrat Harley Staggers) specified that rates for traffic subject to “market dominance” would remain regulated; but for all other intents and purposes, railroad rates, mergers, and abandonments would be effectively deregulated.²⁶

Deregulation unleashed the sudden and decisive resurgence of American railroads, even if the foundations of that resurgence had been laid with the federal funding in the 1970s railway acts.²⁷ In the midst of the recession of 1981, Conrail made a profit, and it would remain profitable. (It would be privatized in 1987 with an initial public offering that

²⁴ Ralph Blumenthal, “Conrail: Some Success, Measured by the Lack of Failures,” *The New York Times*, December 26, 1976, p. E3.

²⁵ Hiner (2006, p. 373); Saunders (2003, p. 187).

²⁶ This meant in practice that roughly 60 per cent of railroad traffic would move at market rates. The remaining 40 per cent flowed on routes considered subject to “market dominance,” and the complex regulation of those rates would be transferred to a Surface Transportation Board when the ICC was abolished in 1995 (Burton and Hitchcock 2019).

²⁷ Saunders (2003, pp. 189-219).

was then the largest in history.)²⁸ Yet rates on the whole were declining. The badly deteriorating railway infrastructure began to improve. So did safety, with fewer wrecks and work accidents, as carriers realized they had to please customers and deliver service.²⁹ As would be the case in other deregulated industries, the railroads became free to experiment. Rail lines were abandoned, often sold to small regional “short-line” roads.³⁰ Mergers continued, but they were less frequently mergers of parallel roads and more often so-called end-to-end mergers. More importantly, the roads were better able to experiment with new technology and organizational structures. This included computers and, perhaps most significantly of all, new “intermodal” methods of shipping, which had been held back before 1980. An industry that had had 1.2 million employees in 1950 was down to 182,000 by the end of the century; ton-miles per employee, which had been two million in 1980, leapt to 7.5 million in 1998.³¹

Deregulation of the railroads was driven in large part by a crisis that regulation had itself created. The trucking industry faced no similar crisis. Although trucking had been originally regulated in the 1930s at the behest of the railroads to benefit the railroads, in the end that regulation mostly benefited trucking itself. In 1948, Congress passed the Reed-Bullwinkle Act, which allowed trucking firms to set rates collusively through regional bureaus without fear of antitrust prosecution.³² As we saw, both the incumbent trucking firms and the Teamsters earned significant rents. These two constituencies made up a

²⁸ The privatized Conrail was taken over by the CSX Corporation and Norfolk Southern Railway in 1999.

²⁹ Aldrich (2018, p. 6).

³⁰ Winston *et al.* (1990, p. 11).

³¹ Saunders (2003, p. 26).

³² Winston *et al.* (1990, p. 7).

formidable tag-team in Congressional lobbying and influence at the ICC.³³ The effect of entry barriers can be roughly gauged by the prices of ICC route licenses, which functioned much like taxi medallions: in the mid-1970s, a license was worth on the order of half a million 1982 dollars.³⁴ Regulation also inhibited innovation and made efficient scheduling difficult, often forcing trucks to return from long hauls empty, a practice called deadheading. The effect of regulation was most significant for the less-than-truckload business, as full truckloads could be carried by freelancers for certain unregulated commodities and shippers could avoid regulation by owning their own trucks.³⁵ (It was the full-truckload business that most ate into the earnings of the railroads.)

Thus whereas railroad deregulation was precipitated by a regulation-induced crisis, political entrepreneurship would play a much more significant role in the deregulation of trucking. This entrepreneurship would come from the executive branch and from members of Congress not directly involved in the committees overseeing the ICC. The 1970s was the era of stagflation, and any policy that could be sold as reducing consumer prices gained salience. Presidents since Eisenhower had favored trucking deregulation. But Gerald Ford and (especially) Jimmy Carter were able to turn deregulation into a significant political issue and to instigate deregulation through executive action. With their prerogative to appoint commissioners, those presidents stocked the ICC with pro-deregulation members. This meant that pro-trucking members of Congress could no longer play a defensive game, merely blocking change at the ICC; now they would be forced to legislate actively to fend

³³ Rothenberg (1994, p. 214).

³⁴ Moore (1983, p. 37).

³⁵ Winston *et al.* (1990, p. 4).

off the deregulatory behavior of the commission.³⁶ And that opened the arena to change, at a time when any policy marketed as inflation reduction could be expected to play well with voters.

In October 1977, Senator Kennedy, then chair of the Judiciary Committee's subcommittee on antitrust and monopoly, held public hearings on trucking regulation.³⁷ In June 1979, Kennedy and Carter together sent legislation to Congress to deregulate trucking. Federal regulations that were "unnecessary and sometimes absolutely nonsensical," the president complained, were adding billions to the costs of the food and manufactured products Americans bought.³⁸ ("Too many trucks are rattling back and forth empty on the road today, burning up precious diesel fuel, because ICC rules prohibit two-way hauling," Carter added.) With the president threatening to veto any bill that was not sufficiently deregulatory, Congress passed the Motor Carrier Act of 1980 in the face of intense lobbying from the trucking industry and the Teamsters.³⁹ Although it was a more modest proposal than he had wanted, Carter signed it into law on July 1.

In effect codifying the earlier efforts of the Ford-Carter ICC, the new legislation was a significant step in the direction of deregulation. Once again the results were quick and dramatic. The number of authorized carriers burgeoned from 17,000 in 1980 to more than 40,000 in 1990, as agricultural haulers, intrastate truckers, subcontractors, and other

³⁶ Rothenberg (1994, pp. 216-217).

³⁷ U. S. Senate (1980, p. 3).

³⁸ Carole Shifrin, "Carter, Kennedy Send Trucking Bill to Congress," *The Washington Post*, June 22, 1979.

³⁹ Rothenberg (1994, pp. 238-239).

previously marginalized outfits received interstate licenses.⁴⁰ The ICC granted nationwide authority to some 5,000 carriers, something it had never done before 1980. The market value of an ICC license fell to nothing.⁴¹ Rents, which had been in the range of 15 per cent of total revenue, began to flow away from the previously protected firms (mostly in the less-than-truckload sector) and the Teamsters toward shippers, consumers, and the new entrants.⁴² By one estimate, the annual benefits to shippers and consumers of surface-freight deregulation, both railroads and trucking, were at least \$20 billion in 1988 dollars.⁴³

The deregulation of surface transportation had significant effects on the organization of industry. With new flexibility in shipping, manufacturers were better able to institute (or reinstitute) just-in-time inventory practices. In 1981, the cost of holding inventories amounted to fully 14 per cent of national product; by 1987, that had fallen to 10.8 per cent, a saving in logistics costs of \$62 billion.⁴⁴ This new flexibility was felt not merely within the borders of the United States but also, crucially, in international trade, where technological and organizational innovation and deregulation were also dramatically reducing costs. The lower costs of shipping goods, coupled with slowly decreasing tariff barriers, would energize a process of international specialization and vertical disintegration.

⁴⁰ Moore (1991, p. 52).

⁴¹ Moore (1983, p. 37).

⁴² Rose (1985, 1987).

⁴³ Winston et al. (1990, p. 41).

⁴⁴ Moore (1991, p. 53).

As we have repeatedly seen, American regulatory policy worked to segment markets, generally along lines of supply technology not market demand. Populist and Progressive understandings of competition and the corporation here dovetailed with the interests of the industries themselves, which rightly saw such segmentation as creating barriers to entry. The Panama Canal Act of 1912 forbade railroads from owning competing water carriers.⁴⁵ The Motor Carrier Act of 1935 permitted railroads to own motor carriers only under special circumstances, and the ICC never found any circumstances special enough. The Federal Aviation Act of 1938 forbade railroad from owning airlines. As a result, shipping that involved more than one mode of transport was a cumbersome and expensive process.

The ICC actively discouraged intermodal shipping. The idea of putting truck trailers or other intermodal containers on railroad cars goes back to the nineteenth century.⁴⁶ By 1921, the New York Central was running container service between Cleveland and Chicago. But in 1931, the ICC decreed that the railroads could not price containers by weight but only by value, meaning according to the highest value of whatever was in the container.⁴⁷ This effectively killed container shipping until 1954, when, at the behest of the New Haven – among the roads most suffering from competition with trucks – the commission finally set restrictive conditions under which railroads could ship goods in trailers without being regulated as motor carriers. Slowly the railroads began

⁴⁵ Stone (1991, p. 156).

⁴⁶ Levinson (2016, p. 206).

⁴⁷ ICC Docket No. 21723, *In the Matter of Container Service*, 173 I.C.C. 377, April 14, 1931, at 384.

experimenting with what they called “piggyback” service, which would be at the heart of the resurgence of railroading after 1980.⁴⁸

Needless to say, shippers do not typically care what technologies are used to move their goods: they care only about price, timing, and reliability. The segmentation and restriction of American surface-transport regulation made it difficult for firms to innovate across modes and to optimize shipment. This left gains from trade lying on the table, which in turn meant that potential entrepreneurial profit awaited anyone who could properly game the rules – or could get them changed. The development of containerized cargo shipping, one of the great systemic innovations of the century, would require institutional entrepreneurship as much as organizational and technological entrepreneurship. Although many people and many firms would be involved, the central figure in the evolution of containerized shipping in the twentieth century was arguably Malcom McLean.⁴⁹

Starting with one truck in 1934, McLean had built McLean Trucking into the country’s eighth largest – and third most profitable – trucking company by 1954, with 617 company-owned trucks. A dynamic presence in a stodgy regulated industry, McLean pushed constantly for innovations that would lower cost. He automated terminals and negotiated fleet discounts for fuel. He created a corporate culture of efficiency, setting up incentives for safety as well as for on-time delivery. To optimize traffic flow, he bought the ICC rights (and sometimes the firms that owned the rights) to multiple routes, thus reducing deadheading. But lower costs could not attract more business if they could not

⁴⁸ Saunders (2003, p. 206).

⁴⁹ Levinson (2016).

be translated into lower prices, so McLean was forced constantly to demonstrate to the ICC that his lower rates resulted from genuinely lower costs not from attempts at “unfair” competition.

Although coastal waterborne shipping was a moribund industry, by 1953 McLean feared that the glut of war-surplus Liberty and Victory ships posed a threat to long-distance trucking. He decided to stay one step ahead – by loading truck trailers onto ships himself. In the days before the soon-to-be-built interstate highway system, this would also avoid growing traffic congestion. Once at their destination port, the trailers could be picked up by other McLean tractors for the final leg of the trip. Crucially, the scheme could take advantage of the fact that the ICC permitted lower rates for water shipping than for land shipping. To make all this happen, McLean bought a subsidiary of the Waterman Steamship Corporation, which had rights at several ports from the northeast to Houston. The ICC was alarmed that a trucking company had come to own a steamship company; but, using the device of a trust, McLean quickly engineered a transfer of his ownership from the trucking company to the steamship company. In 1955, that company bought out all of Waterman in what was effectively an early leveraged buyout. McLean’s shipping company changed its name to Sea-Land, which in 1969 briefly became a division of the R. J. Reynolds Tobacco Company as McLean sought funds to expand his growing empire.

As he moved into ocean shipping, McLean passed beyond the idea of putting truck trailers on ships. His guiding insight was that he was in the business of delivering cargo not of sailing ships or driving trucks. He would not ship wheeled trailers; he would ship standardized containers – metal boxes – without wheels. Containers could be transferred easily across modes, from ships to trucks to rail, as necessary. On April 26, 1956, a

converted war-surplus tanker called the *Ideal-X* set sail from the port of Newark. Five days later it deposited 58 containers – aluminum truck bodies without wheels – in Houston.

Containers were not a new idea; and McLean was soon joined by others in the ocean-going container business. But McLean supplied the drive, initiative, and early scale necessary to open a path to a world-wide system of containerized shipping. That system consisted of an array of complementary elements – containers, ships, trucks, ports, cranes, rail cars, rail yards – all of which had to be reinvented simultaneously. As with other complex technological systems of the twentieth century, that meant battles over standards. Some of the battles would take place within the International Standards Organization, where the sizes and specifications of the modern container evolved over the course of more than a decade. Some of the battles would be fought in ports around the world, as dockworkers unions futilely resisted the changes that would obviate their labor. The deregulation of railroads and trucking in 1980 came as a shot in the arm for intermodal shipping. One firm could now own assets in more than one mode, lowering transaction costs and, perhaps more importantly, building logistics capabilities that were genuinely intermodal rather than rooted in a particular technology.⁵⁰ There is evidence that containerization became a major driver of globalization in the late twentieth century, one even more important than tariff reductions.⁵¹

The first instance of transportation deregulation in the 1970s actually took place in the air not on the surface.⁵² As we saw, air travel had been regulated by the Civil

⁵⁰ Pettus *et al.* (2017, p. 389).

⁵¹ Bernhofen, El-Sahli, and Kneller (2016).

⁵² Borenstein and Rose (2014); Vietor (1994, pp. 23-90).

Aeronautics Board since 1938. In addition to dictating fares, the CAB controlled routes and entry. This not only assured the dominance of the four major trunk carriers, American, Eastern, TWA, and United, but also froze in place a point-to-point configuration of routes uninformed by any market test. Unlike the trucking industry, however, the airlines were forced to dissipate the rents of regulation: unable to compete on price, they had to compete along margins of service, comfort, and convenience. Because the CAB would not let them charge passengers lower fares for older, slower, or less-comfortable planes, the airlines invested in the newest jet technology, including the Boeing 707 as soon as it came off the drawing board. They all later acquired fleets of roomy wide-body planes like the Boeing 747, Douglas DC-10, and Lockheed L-1011. They provided passengers with amenities, famously including piano lounges on some 747s. More significantly, to attract business travelers seeking convenience, they ran numerous flights to major destinations. As a consequence, planes flew half full on average, their inefficiently empty seats allowing customers to spread out and enjoy yet another amenity.

In 1974, Ted Kennedy was chair of the Judiciary Committee's subcommittee on Administrative Practice and Procedure.⁵³ This vaguely titled post gave him a hunting license to pursue Progressive causes. Kennedy set his sights on the highly visible and glamorous airline industry. He hired as general counsel a Harvard law professor named Stephen Breyer, who had recently been on the staff of the Watergate Special Prosecutor. The future Supreme Court Justice produced a scathing report detailing the inefficiencies of airline regulation and calling for deregulation. Kennedy held well-publicized hearings,

⁵³ Breyer (1982, p. 433); Vietor (1994, pp. 51-57).

pummeling CAB commissioners and airline executives with the incisive questions Breyer supplied. The hardest question to answer was this: why were flights on unregulated intrastate routes in California and Texas, flown with inexpensive turboprop equipment, much cheaper than those on regulated interstate routes of the same length?⁵⁴

As they would soon do with the ICC, Presidents Ford and Carter appointed pro-deregulation members to the CAB. Carter named as chair Alfred Kahn, arguably the country's foremost economist of regulation, whose work would influence all the debates on deregulation. The many unions serving airline employees were adamantly opposed to deregulation, as, initially, were most of the airlines, though some of the carriers, notably United, sensed opportunity. After many more hearings and years of political wrangling, Congress passed the Airline Deregulation Act of 1978, which Jimmy Carter signed in October of that year. Not only did the act provide for the relaxation of rate and entry regulation, it also called for the outright abolition of the CAB by 1985.

Deregulation initially called forth entry by a large number of startup airlines, many offering supersaver fares. These were quickly shaken out, as ultimately were two of the big-four domestic carriers, Eastern and TWA. (In 1968, Stanley Kubrick could imagine Pan American, the country's flagship international carrier, operating flights to a futuristic space station. Long before 2001, Pan Am too would be out of business, its landmark skyscraper astride Park Avenue renamed for an insurance company.) The suddenly deregulated carriers found themselves with fleets of ill-adapted large jets, just as fuel prices were spiking and a recession was setting in. They quickly moved to acquire smaller and

⁵⁴ Keeler (1972).

more economical planes like the Boeing 737 and the Douglas DC-9. They also got rid of the hotel chains and – you guessed it – car-rental companies they had integrated into under regulation.

What deregulation revealed most clearly was that the point-to-point route structure inherited from the days of airmail was all wrong. Airlines were far more successful when they adopted a hub-and-spoke system, much like the system long in use by less-than-truckload road shippers. Those who moved most quickly to adopt a hub system, notably American, gained first-mover advantages. Delta, once a smaller regional airline, became a major player on the strength of its Atlanta-based hub-and-spoke system. Although smaller airlines had not initially proven widely successful in an industry that, like the railroads, exhibited high fixed costs and low marginal costs, all the majors either created or allied with smaller feeder airlines to funnel passengers into their hubs.⁵⁵ As the railroads had always wanted to do, the airlines attacked the fixed-cost problem by engaging in price discrimination, charging more to inflexible business travelers with expense accounts and less to flexible tourists flying on their own dime. By the end of the century, this had evolved into a complex system of “yield management” in which ticket prices on the same flight could vary widely as computerized systems optimized fares.⁵⁶

Although low-cost entrants had fared poorly in the 1980s, they began a resurgence in the 1990s. By the turn of the century, low-cost carriers had 15 per cent of the domestic

⁵⁵ Vietor (1994, p. 81).

⁵⁶ With the coming of the Internet in the twenty-first century, consumers found it increasingly easy to game the yield-management system. The airlines were forced to turn to an older style of price discrimination – charging separate fees for services like meals and checked baggage.

market.⁵⁷ Half of that market share came from Southwest Airlines, once a low-cost intrastate carrier in Texas. Using an aggressive no-frills strategy and taking advantage of underutilized airports, Southwest became the only consistently profitable major airline in the country. Its market share continued to grow rapidly into the twenty-first century. The mere threat of Southwest expanding to a new route was enough to discipline the fares of the major carriers.⁵⁸ Thanks to these low-cost airlines, and with rising incomes, the number of passengers traveling by air took off. Whereas flying was once synonymous with the *beau monde* – the jet set – air travel after deregulation became increasingly available to the *hoi polloi*, who crowded into America’s airports and packed into every available airplane seat. In 1971, only 49 per cent of the American population had ever been on an airplane; by 1997, 81 per cent had.⁵⁹ According to one estimate, the annual gain to society from airline deregulation has been at least \$8 billion in 1977 dollars (something like \$33 billion today).⁶⁰ Another calculation finds that fares in 2011 were 26 per cent lower than they would have been under regulation, representing a benefit to consumers of some \$31 billion in that year.⁶¹

Although the deregulation of passenger air travel garnered the most attention, the little-noticed deregulation of air freight may have generated even greater net social value – and helped to shape the economic geography of production in the late twentieth century

⁵⁷ Borenstein and Rose (2014, p. 82).

⁵⁸ Goosbee and Syverson (2008).

⁵⁹ According to Airlines for America, the industry trade group. The figure today is 87 per cent. <https://www.airlines.org/dataset/air-travelers-in-america-annual-survey/>, accessed April 30, 2021.

⁶⁰ Morrison and Winston (1986, p. 51).

⁶¹ Borenstein and Rose (2014, p. 77).

to perhaps an even greater extent than did containerization.⁶² After the war, hundreds of small air-cargo firms popped up, taking advantage of military-surplus planes.⁶³ These startups represented competition for the passenger airlines, whose planes carried cargo in their holds. In 1947, the CAB began to take notice. It began regulating cargo carriers under much the same rules as the passenger lines. Entry was restricted. Routes were licensed in ways that often resulted in empty backhauls. For its part, the ICC demanded that the air-freight firms use only licensed ground carriers for hauls 25 miles beyond the airport, leading many carriers to fly cargo that should have been shipped in trucks.

One of the firms most disadvantaged by the regulation of air freight was a startup called Federal Express, which had been incorporated by 27-year-old Fred Smith, Jr. in 1971.⁶⁴ Smith's business model was to take the hub-and spoke approach to the extreme, copying for air freight the system used for truck-borne surface freight by companies like United Parcel Service, an early proponent of piggyback rail.⁶⁵ Rather than sort packages locally, FedEx would immediately fly all parcels to a single efficient facility in Memphis, where they would be quickly sorted at night and then carried to their destinations on planes retracing their inbound routes. The company would own both the planes it flew and the trucks it drove. Legend has it that, back in the days when the Ivy League still handed out such grades, this idea had earned Smith a C on an economics term paper at Yale.⁶⁶ In the

⁶² Hummels (2007, p.152).

⁶³ Carron (1981).

⁶⁴ Lovelock (2004). This Frederick W. Smith is no relation to the Frederic Smith who ran the Olds Motor Works early in the century.

⁶⁵ Saunders (2003, p. 129).

⁶⁶ In fact, Smith claimed not to remember what grade he got (Dumaine 2002). The point of the paper was less the idea of a hub-and-spoke system than an argument that the high-tech businesses of the future would need an extremely fast and reliable system of parts delivery.

beginning, Smith's Yale instructor seemed vindicated, as the company began losing money. At one point it was technically bankrupt. But venture capitalists continued to provide financial infusions; and, as would be common in the world of startups in this era, the VCs began intervening more heavily in company management.⁶⁷ By 1975, FedEx was in the black.

The biggest obstacle to the company's growth was the CAB.⁶⁸ Initially FedEx was not subject to CAB regulation because it flew only small planes – the Dassault Falcon 20 – and was considered a mere “commuter” airline. In 1975, the company applied to the CAB to operate five larger jets.⁶⁹ The board, which had approved no new cargo carriers since 1956, said no. FedEx was forced to run multiple Falcons wingtip to wingtip on its denser routes. This was costing the company some \$12 million a year.⁷⁰ Meanwhile, the ICC was prohibiting FedEx vans from venturing more than 25 miles from their airports. Deregulation of air cargo had been part of the ongoing discussion of airline deregulation. In what was almost certainly a deliberate attempt to force the hand of Congress, the pro-deregulation appointees to the CAB held off on granting administrative relief to FedEx and other carriers. With the airlines distracted by the more-controversial issue of passenger deregulation, and through the ministrations of attorneys for FedEx and other parcel firms,

⁶⁷ Gompers (1995, p. 1465).

⁶⁸ Among the most important services FedEx offered was the overnight delivery of letters and documents. This brought the company into contact with another manifestation of federal regulation, the Postal Monopoly Statute. Were these overnight missives first class mail, which only the U. S. Postal Service was permitted to deliver? Fearing legislation after FedEx and other courier companies instigated hearings in the House of Representatives in 1979, the USPS promulgated a regulation (39 CFR Sec. 320.6C) that permitted the shipment of “time sensitive” documents if they were priced at more than twice the applicable first-class rate.

⁶⁹ Bailey (2010, p. 193).

⁷⁰ Carron (1981).

cargo deregulation was quietly separated off and slipped into a bill in October 1977. Jimmy Carter signed it the next month. Federal Express immediately began buying larger jets, including a couple of DC-10 widebodies in 1980. Over the following two years, its daily volume jumped 150 per cent. FedEx shares that had been trading at \$2 in 1976 exploded to \$93.25 in December 1979.

As the country continued its shift into lightweight high-value products like semiconductors and other electronic devices, air cargo became increasingly significant. An industry that in 1955 had transported a negligible fraction of the country's international trade came by 2004 to account for a third by value of imports and half of exports outside North America.⁷¹ Whereas ocean-going transport had underpinned the first great globalization of the late nineteenth century, it was arguably air cargo that energized the globalization of the late twentieth century.

Deregulation would free not only the flow of physical goods but also the flow of information. As we recall, the Federal Communications Commission controlled the entry, and to a significant extent the content, of America's radio and television stations for most of the century. Directly and indirectly, the commission also influenced the rate and direction of technological change in broadcasting. As in other sectors, however, the regulation of broadcasting was becoming increasingly misaligned with the developing technological and market opportunities of the postwar era. Institutional entrepreneurs would once again emerge to upend the regulatory regime, ultimately overturning the

⁷¹ Hummels (2007, p. 152).

foundational presumption that the electromagnetic spectrum is a commodity too scarce and valuable to be allocated by voluntary arrangements.

What we now know as cable television started life, and was long known, as community-antenna television (CATV).⁷² As early as 1948, entrepreneurs realized that they could set up tall antennas to receive weak signals and then transmit those signals via coaxial cable to households that would otherwise have had little or no reception. By 1964, there were more than 1,000 CATV operators and a million subscribers. If households were directly wired with cable, however, there was no technological reason to limit what they received to amplified versions of the ambient programming available from the nearest stations. Thanks to one of the most subtly disruptive technologies of the postwar era – microwave transmission, descended from the radar innovations of the war – CATV operators began acquiring other content, including not only broadcasts from distant stations but also programs not available over the air. By the mid-1960s, CATV was moving into metropolitan markets where over-the-air reception was just fine, creating competition for the incumbent broadcasters. The FCC leapt to attention. Even though it had no legislative authority to do so, the commission attempted to regulate cable.⁷³

In 1966, the FCC barred CATV from the country's 100 largest cities.⁷⁴ Cable would be prohibited whenever it threatened incumbent interests. This desideratum went beyond the protection of the existing VHF stations to encompass the commission's new

⁷² Besen and Crandall (1981); Hazlett (2017, pp. 102-118).

⁷³ The broadcasters also complained that the CATV operators were violating copyright by rebroadcasting their signals. The Supreme Court twice ruled against the broadcasters, but in 1976 Congress passed a bill mandating compulsory licensing at a low fee (Besen and Crandall 1981, p. 103).

⁷⁴ Wu (2010, p. 181).

enthusiasm, ultra-high-frequency stations. In recognition of its miserly allocation of spectrum to TV in the VHF range, the commission had begun licensing UHF stations and demanding that makers of televisions include UHF tuners in all sets. Readers of a certain age will remember the small loop antennas attached to the backs of TVs in those days. They will also recall that UHF reception was virtually non-existent at any distance from the transmitters and that essentially no one watched UHF channels. In the event, cable would be the savior of UHF stations, as it could deliver their signals far more clearly and reliably than could the airwaves; but in the 1960s and 1970s, the FCC was sure that cable would destroy UHF.

By 1972, the Supreme Court had affirmed the FCC's right to regulate cable, and the commission had in place an intricate set of rules and restrictions that attempted to micromanage what cable was and was not allowed to present. Yet the end of cable regulation was already in sight. Cable was "spectrum in a tube," offering a vastly expanded bandwidth that entirely undermined the commission's long-maintained scarcity rationale for regulating broadcasting.⁷⁵ The untapped value of cable was enormous. The owners of broadcasting properties began hedging their bets by investing in CATV franchises themselves; and, sensing the opportunities, potential creators of content agitated for change. In 1977, the recently created Home Box Office sued successfully to vacate the FCC's rules limiting pay cable.⁷⁶ The Nixon White House, no friend of the established broadcasters, issued a report calling for the deregulation of cable.⁷⁷ By the end of the

⁷⁵ Hazlett (2017, pp. 106-110).

⁷⁶ *Home Box Office v. FCC*, 567 F.2d 9 (1977).

⁷⁷ Wu (2010, pp. 184-185).

1970s, the commission was falling all over itself to undo the regulations it had so carefully put in place only a few years earlier. The result, of course, was the unleashing of a vast new creative medium. In 1976, the commission authorized entrepreneur Ted Turner to beam his Atlanta-based superstation to cable systems by satellite, opening up the era of nationwide cable networks.⁷⁸ As late as 1985, broadcast TV still accounted for 90 per cent of American prime-time viewing. By the turn of the millennium, that was down to half. In the year 2000, 85 per cent of homes were wired for cable.

As the drama of cable was unfolding in the 1970s, technological change, notably including microwave transmission, was also undermining the regulation of the FCC's other major client, AT&T. The breakup up of what was then the world's largest corporation surely counts among the most significant acts of deregulation of the twentieth century.

At first, the threats to AT&T's grip over telephony, systemic and comprehensive since the days of Theodore Vail, came as bee stings. In the late 1940s, the company became aware of a device called the Hush-A-Phone, a cup-like attachment that clipped to a phone receiver and promised to reduce the effect of ambient noise on a phone conversation.⁷⁹ (The 1940s version of the device had in fact been designed by the acoustics pioneer Leo Beranek.) AT&T technicians threatened with disconnection anyone they found using the device. When Hush-A-Phone's owner Harry Tuttle protested to the FCC, the commission upheld AT&T's view that the attachment was a threat to the integrity of the phone system, and they tied Tuttle up in hearings for years. Finally, in 1956, a federal appeals court

⁷⁸ Horwitz (1989, p. 256).

⁷⁹ Wu (2010, pp. 101-114, 190-191).

overturned the FCC ruling. This opened the door to the possibility of attaching third-party devices to the Bell System, something that the developing computer industry had begun clamoring for.⁸⁰ In its Carterphone decision in 1968, the FCC ordered the Bell System to permit the attachment of a system that could connect mobile radio to the telephone network. AT&T agreed to create a standard interface that would allow connection of third-party terminal equipment, soon to include not only telephone handsets but also modems, fax machines, and other data-processing devices.

The far bigger threat came in the business of long-distance service. As we saw, in 1956 AT&T had reached an accommodation with the Department of Justice by increasing the cross-subsidy of local phone service at the expense of long-distance service, precisely the opposite of the cross-subsidy economic efficiency would have demanded. This left the company vulnerable to stand-alone providers of long-distance service that could take advantage of the new microwave technology to avoid having to string copper wires. Of course, such competitors could not then hook up to local-area telephone networks; but they could make long-distance connections for large corporations and other organizations that operated their own internal telecommunications systems. In 1968, this possibility – and more – occurred to venture capitalist William McGowan when he was approached by a tiny startup called Microwave Communications, Inc., which had applied to the FCC to supply private-line microwave service between St. Louis and Chicago. The commission had tied up MCI's application for years. Commandeering control of MCI, McGowan began an assault that would ultimately result in the breakup of the Bell System.

⁸⁰ Temin with Galambos (1987, pp. 41-54).

In 1969, the commission finally approved MCI's petition for private-line service, opening itself up to a flood of applicants for microwave stations.⁸¹ (Among these was the Southern Pacific Railroad, which could set up microwave towers along its rights of way. This business would evolve into Sprint.) McGowan then demanded that MCI be allowed to connect into Bell's local phone networks. AT&T complained that this was mere cream skimming. In 1971, however, the FCC ruled in a 4-3 vote that specialized carriers could indeed connect to the local loops. MCI began offering more and more services once restricted to AT&T, often presenting these to the commission as *faits accomplis*. When in 1975 MCI was in a position to offer essentially the full complement of long-distance services, the FCC finally put its foot down. McGowan sued, and an appeals court vacated the commission's ruling. By 1979, long-distance phone service had become competitive, and AT&T's monopoly was effectively restricted to the level of the local operating companies.

McGowan's lobbying and political maneuvering were not limited to the FCC. His voice was also heard at the Department of Justice, which, as we have seen, had long had its eye on AT&T.⁸² On November 20, 1974, William Saxbe, Gerald Ford's attorney general, filed an antitrust suit against AT&T, seeking both the divestiture of Western Electric and the spinning off of some or all of the local operating companies. (For good measure, McGowan had also filed a private antitrust suit.) The government case proceeded at a glacial pace until 1978, when it fell into the lap of D. C. District Court Judge Harold

⁸¹ Vietor (1994, pp. 194-202).

⁸² Temin with Galambos (1987).

Greene.⁸³ Greene promptly issued marching orders and eventually pushed the case to trial in January 1981, in the midst of the transition from the Carter to the Reagan administration. To head the Antitrust Division, President Reagan appointed a Stanford law professor called William Baxter. As both the new attorney general and his deputy quickly recused themselves, Baxter would have full authority over the AT&T case, which he very much wished to continue prosecuting. As it had in the Eisenhower administration, the defense department, now under the powerful Caspar Weinberger, objected strenuously: a unified telephone system under central control was essential to national defense. At the commerce department, Malcolm Baldrige agreed. But the strong-willed Baxter held firm, vowing to litigate the suit “to the eyeballs.”⁸⁴

Baxter objected to the various remedies that had been proposed in the case, which were typically a mix of divestiture and ongoing restrictions of an essentially regulatory character. (Indeed, as the lead attorney for AT&T put it, “antitrust and regulation are, for us, two sides of the same coin.”)⁸⁵ Baxter did not see AT&T’s vertical integration with Western Electric as a problem. The only parts of the company that possessed the character of natural monopoly were the local operating companies, which could continue to be regulated at the local level; these, he argued, could be cleanly shorn off, leaving AT&T as an independent electronics firm that, freed from the constraints of the 1956 consent decree, could compete in the technologies of the future, including in computers against IBM.⁸⁶ As

⁸³ Temin with Galambos (1987, pp. 200-264).

⁸⁴ “Baxter on AT&T,” *The New York Times*, April 12, 1981, Section 3, p. 18.

⁸⁵ Temin with Galambos (1987, p. 116).

⁸⁶ Temin with Galambos (1987, p. 282).

Congress began to consider legislation that would have increased rather than decreased interference with his company's operations, AT&T CEO Charles Brown decided that Baxter's divestiture proposal was the least-bad option; and the two men sat down to craft a settlement. On January 8, 1982, Brown and Baxter announced their agreement, which Judge Greene would modify slightly (to the agreement's detriment) and finally sign in August.⁸⁷ Also on January 8, 1982, Baxter announced that the Department of Justice was dropping its long-running antitrust suit against IBM.

In the event, AT&T would do no better against IBM in computers than had GE or RCA. Indeed, AT&T would be the early loser in telephone deregulation.⁸⁸ The final decree created seven holding companies – Baby Bells – containing the former local operating companies. These continued to be regulated at the state level, and indeed political pressure at that level would adjust rates to keep the cross-subsidy mostly flowing. At the same time, the Baby Bells no longer needed to buy their equipment from Western Electric, which saw its sales plummet, especially for run-of-the-mill items that could be procured more cheaply on the market. Early in the twenty-first century, the husk of AT&T would be acquired by SBC Communications, a descendent of one of the Baby Bells, which would adopt the name and logo of its quondam parent.

In the long run, an even more significant regulatory change in 1982 may well have been the FCC's grudging willingness to begin allocating spectrum to a tiny and undeveloped competitor to the hardwired phone system – mobile telephony.

⁸⁷ *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983).

⁸⁸ Crandall (1988).

In 1945, Mervin Kelly discovered on his desk at Bell Labs a proposal for AT&T to get into the business of mobile phones for cars.⁸⁹ By 1947, two of his researchers had produced a report suggesting that mobile telephony should be implemented in a decentralized way, using low-powered transmitters in a honeycomb pattern of geographic cells. The company applied to the FCC for spectrum in the UHF range. Having embarked on its UHF-TV experiment, the commission said no. Mobile service would be restricted to a tiny VHF band above FM radio. This meant that, even in New York, fewer than a dozen users could communicate simultaneously on their car phones, which in those days were cumbersome and expensive radios that filled an entire sedan trunk and connected through a human operator. Bell Labs shelved the idea of cellular telephony for two decades. “In a wide array of areas,” Peter Drucker would lament in 1984, “from the transistor to fiber optics, and from switching theory to computer logic, the Bell System has been no more adequate as a conduit for Bell Labs’ scientific contributions than an eye dropper would be to channel a mountain freshet.”⁹⁰

By the mid-1960s, grappling with the increasingly visible deficiencies of UHF-TV, the FCC signaled to AT&T that it might reconsider the idea of some UHF spectrum for mobile telephony.⁹¹ Bell Labs got back to work. In 1969, the company employed a rudimentary cellular system to equip Amtrak’s Metroliner with a phone booth. Bell Labs engineers hauled a trailer full of electronic equipment through the streets of Philadelphia to tweak a prototype cellular system. Motorola, which would go on to become one of the

⁸⁹ Gertner (2012, pp. 280-283).

⁹⁰ Drucker (1984, p. 18).

⁹¹ Gertner (2012, pp. 285-297); Hazlett (2017, pp. 173-191).

leading manufacturers of cell phones, was also working on cellular technology. Yet, as the main supplier of equipment for existing car phones, Motorola was at same time spending considerable energy lobbying the FCC to prevent the adoption of what it considered a competitive threat. In 1970, the commission broke off 75 MHz of UHF spectrum from TV and gave it to cellular, only to cut that back almost by half a few years later at Motorola's suggestion. In 1982 – 37 years after that memo had landed on Mervin Kelly's desk – the FCC finally began accepting applications for cellular licenses.

The FCC would allot two licenses to each geographic region.⁹² One of these had to go to an existing wired-line carrier, which in 1982 meant a Baby Bell. The other could go to a new entrant. The commission was quickly inundated with 137 applications from 58 companies of all sorts. As it always had, the commission would hold hearings and then hand out the licenses for free. Because each company had to try to persuade the commission of its suitability, each application was massive, with supporting details generally supplied by “application mills” on contract. In the face of this information overload, the commission did what it had long done: simplify the decisions to easily measurable technical criteria, in this case coverage area. But as awards slowly trickled out, far more applications streamed in. The FCC became overwhelmed. As a last-ditch effort, the commission decided to make use of a 1981 law that permitted it to assign licenses by lottery. Applicants still had to supply supporting documents – so many documents indeed that at one point the structural integrity of the building holding them became threatened; but licenses, and the associated scarcity rents, were to be allocated randomly. The result

⁹² Hazlett (2017, pp. 192-211).

was a frenzy: by the end, there would be some 400,000 license applications.⁹³ Large and capable firms like McCaw Cellular in the Pacific Northwest were ultimately able to buy out the tinier winners to assemble coherent cellular systems.

It took another ten years for the federal government to realize that the scarcity rents could actually go to the taxpayers. In August 1993, Bill Clinton signed legislation requiring the FCC to allocate spectrum by auction. Of course, in many minds the auctioning off of the electromagnetic spectrum – the commodification of humanity’s magical etheric resource – represents the apotheosis of neoliberalism come to Washington in the late twentieth century. The name most closely identified with the idea of auctioning spectrum is that of Ronald Coase, a member of both the Mont Pèlerin Society and (one version of) the Chicago School of economics. Coase’s 1959 paper “The Federal Communications Commission” was a damning indictment of the inefficient and politicized way that body allocated spectrum. Coase argued that property rights in the electromagnetic spectrum could easily be defined and traded – and that the government should auction them off.⁹⁴ In 1960, Coase generalized his ideas in “The Problem of Social Cost,” an essay that would lay the foundation stone of the modern law-and-economics movement.⁹⁵

Yet Coase was not the first to propose in writing the idea of auctioning off the spectrum. In 1951, in an article Coase cites, a law student at the University of Chicago named Leo Herzel made exactly this suggestion in the context of the contemporary

⁹³ McAfee, McMillan, and Wilkie (2010, p. 169).

⁹⁴ Coase (1959).

⁹⁵ Coase (1960).

litigation over color television between RCA and Columbia.⁹⁶ Far from being a member of the Chicago School, however, Herzel was influenced by the market-socialist ideas of Abba Lerner, which were an attempt to rationalize the practice of a socialist society using principles of optimization. (“When I read the briefs in the case and the lower court opinion,” Herzel wrote later, “the arguments made me think immediately of socialist commissars debating the fine points of competing technologies.”) As Bill Clinton’s FCC came to design the actual auctions in 1994, they discovered they were faced with a daunting optimization problem, one ultimately solved by teams of clever mathematical economists and game theorists.⁹⁷ Given the enormous potential value that cellular technology was creating, moreover, it is far from clear that there would have been any feasible solution other than auctions in 1994.

None of this is to say that ideas, including the ideas of Coase, were unimportant in the deregulation of the late twentieth century, not only for the auction of electromagnetic spectrum but also for the gradual reform and rationalization of antitrust policy. Yet, as they had in the past, other forces – economic, political, and institutional – would also play important roles in the evolution of American antitrust policy in this era. It has been a central theme of this book that the large vertically integrated corporation in the twentieth century owed its rise to prominence in significant part to the eclipse of the market and the growth of state power during the Depression and the World Wars. After World War II, the market began to reassert itself, struggling at – and frequently bursting out of – the bonds in which it had been encircled by the New Deal. What had seemed a world of powerful firms

⁹⁶ Herzel (1998).

⁹⁷ McAfee, McMillan, and Wilkie (2010).

and fragile markets transformed into a world of powerful markets and fragile firms. Antitrust policy was forced to respond.

During the New Deal, Thurman Arnold had created a vision of antitrust as hands-on regulation of industry. Although his legal-realist goal had explicitly been consumer benefit, he was animated by a generalized hostility toward business rather than by any kind of economic theory; and, more often than not, his prosecutions redounded to the detriment rather than to the benefit of consumers. The bureaucratic model of antitrust policy Arnold had initiated reasserted itself after the war. Antitrust jurisprudence followed suit, especially during the Warren era, even though the courts were somewhat more likely than the prosecutors to embrace the older populist view that antitrust should protect existing small competitors at the expense of higher costs to consumers. In the 1950s, the Structure-Conduct-Performance paradigm arrived to provide the Arnoldian program of antitrust with the economic underpinnings it had lacked. In practice, the highly complex S-C-P approach resolved itself into a Structuralist approach: what mattered for antitrust policy was the structure of the industry, meaning almost entirely the extent of industrial concentration.⁹⁸ Informed by the theory of perfect competition that had been invented during the interwar formalization of microeconomics, Structuralism ensconced in antitrust enforcement a goal of economic efficiency – albeit a pinched and oversimplified account of economic efficiency – well before the rise to prominence of the Chicago School.⁹⁹

⁹⁸ Meehan and Larner (1989, pp. 182-183).

⁹⁹ It is often asserted nowadays that it was the Chicago School, specifically Robert Bork (1978) in *The Antitrust Paradox*, that is responsible for ensconcing economic efficiency as the only goal of antitrust policy (Crane 2013; Khan 2017, p. 720). In fact, as we have seen, consumer benefit (which is not efficiency, though it often a proxy for efficiency) was the central goal of Thurman Arnold. Although Kaysen and Turner (1959, pp. 11-12) did suggest that in principle antitrust might also have goals like

As we saw, in 1965 Lyndon Johnson appointed a strong proponent of the Structuralist view as head of the Antitrust Division. Donald F. Turner, a Ph.D. economist as well as an attorney and law professor, had produced a 1959 treatise with Carl Kaysen that was widely considered the definitive reference on antitrust law.¹⁰⁰ At the Justice Department, Turner created an official position for an economics advisor, filling it with a string of up-and-coming industrial-organization economists.¹⁰¹ In 1968, Turner's office issued the Division's first official merger guidelines, conceived strictly in terms of the level of market concentration and contemplating no possibility of an efficiency defense.¹⁰² Perhaps more significantly, Turner's Antitrust Division was predisposed to consider as anticompetitive virtually all forms of vertical relations and complex contracting between firms. Oliver Williamson, one of the people who served as Turner's chief economist, branded this as the "inhospitality tradition."¹⁰³

Before the 1970s, during the postwar era of success for the large vertically integrated firm, almost all economists were inhospitable. This was true even of economists associated with what would come to be called the Chicago School. Henry C. Simons, a leader of the "first" (prewar) Chicago School and one of the country's most prominent liberal intellectuals, called for the breakup of what he saw to be widespread oligopolistic

economic stabilization and distributional equity, in the end, they believed, economic efficiency – understood exactly the way Bork understood it – is the only goal that antitrust is actually equipped to pursue, and those other goals should be assigned to other areas of government policy.

¹⁰⁰ Kaysen and Turner (1959).

¹⁰¹ Shepherd (1996, p. 948).

¹⁰² Meehan and Larner (1989, p. 186).

¹⁰³ Williamson (1983, p. 292). This was based on Turner's remark that he approached a certain kind of vertical contracting "not hospitably in the common law tradition, but inhospitably in the tradition of antitrust law."

industries.¹⁰⁴ (He also wanted national chartering of corporations and the outright nationalization of many industries with significant economies of scale.) In the early 1950s, George Stigler, who would become a leader of the postwar Chicago School, was “an aggressive critic of big business” who believed that monopoly was the predominant form of organization in many industries.¹⁰⁵ In 1952, he published an article in *Fortune*, called “The Case against Big Business,” that demanded the dissolution of America’s largest firms.¹⁰⁶ Much of this fervor for antitrust, of course, was a legacy of the Great Depression and the New Deal, which had made it seem to many liberals that the political alternative to muscular antitrust was not *laissez-faire* but rather the sort of industrial planning that Rexford Guy Tugwell and others had on offer.¹⁰⁷

As memories of the prewar era faded, some economists, notably those who would become associated with the Chicago School, began to reassess many of the presuppositions of the S-C-P paradigm, including not only the meaning of industrial concentration and barriers to entry but also, perhaps more importantly, the nature and function of complex interfirm contracting, especially vertical contracting. We have already encountered and analyzed many of these contractual devices. The fulcrum of debate was arguably the theory of monopoly “leverage” in tying arrangements. Already in 1956, Aaron Director, widely understood to have been the inspiration and driving force of the postwar Chicago School of antitrust, had argued that, in simple cases (like IBM machines and punched cards), a

¹⁰⁴ Simons (1934).

¹⁰⁵ Stigler (1988, p. 97).

¹⁰⁶ Stigler (1952).

¹⁰⁷ Dewey (1979).

firm with market power in one good cannot leverage its market power into a second market by tying.¹⁰⁸ There is only “one lump” of market power. The consumer is really buying a service that requires both goods, and there is only one price for that combined service; the most the seller can do is rearrange the prices attached to the components (tabulating machines and cards). Soon economists began to reexamine the functioning of a wide array of other vertical business practices, including exclusive territories and contractual (as against state-enforced) resale-price maintenance.

Richard Posner famously cast the methodological position of the Chicago School as simply a matter of “viewing antitrust policy through the lens of price theory.”¹⁰⁹ This remark has caused its share of confusion. For one thing, it is arguably the Structuralist view that owed the most to price theory, especially the formalized interwar price theory of Edward Chamberlin and Joan Robinson. And it was precisely this sort of price theory that led Structuralism to its often-absurd conclusions about business practices. If one conceives the epitome of competition to be large numbers of small powerless entities trading undifferentiated goods in spot markets, one is left with very little apparatus for understanding the complexities of real-world competition. As Coase put it in 1972, “if an economist finds something—a business practice of one sort or other—that he does not understand, he looks for a monopoly explanation. And as in this field we are very ignorant, the number of ununderstandable practices tends to be rather large, and the reliance on a

¹⁰⁸ Director and Levi (1956). Although they had absorbed the Director and Levi point that tying is really often about price discrimination, Kaysen and Turner still maintained that “tying tends to spread market power into markets where it would not otherwise exist” (Kaysen and Turner 1959, p. 157). They called for it to be illegal *per se*. Although they explicitly consider only the simple punched-card case, Kaysen and Turner do mention (but do not explore) possible dynamic effects. Whether tying might have negative effects in much-more-complex dynamic settings is a question to which we return.

¹⁰⁹ Posner (1979, p. 928).

monopoly explanation, frequent.”¹¹⁰ It is true, as Posner notes derisively, that the work of S-C-P practitioners was strewn with ideas that were “un-theoretical, descriptive, ‘institutional,’ and even metaphorical.” But these were in the end but adornments to what was basically a simple price-theoretic account of competition.

If the “lens of price theory” means anything, it means putting the magnifying glass to complex business practices and bringing careful economic reasoning to bear at a micro level. Yet, in another sense, the practice of the Chicago School reflected a passage *beyond* formal price theory. It is impossible to understand why IBM would tie the purchase of punched cards to the lease of its tabulating machines without recognizing that information is costly and imperfect. And to recognize the costs and imperfections of information is to step out of the world of price theory into the world of transaction costs. In this respect, astute observers have detected a split within the postwar Chicago School. Some Chicagoans, like Posner and Stigler, did often employ price theory in the sense of their colleague Gary Becker — “the combined assumptions of maximizing behavior, market equilibrium, and stable preferences, used relentlessly and unflinchingly.”¹¹¹ But others have followed a more empirical and common-sensical approach influenced by Adam Smith and Alfred Marshall, and maybe by the older Chicago School of Frank Knight, Jacob Viner, and Simons. Deirdre McCloskey calls this second version “the Good Old Chicago School.”¹¹²

¹¹⁰ Coase (1972, p. 67).

¹¹¹ Boettke and Candela (2014), citing Becker (1976, p. 5).

¹¹² McCloskey (1997).

The formative figure of this second version of the Chicago School was of course Coase. His 1959 and 1960 papers had zeroed in on the centrality of property rights for economic organization. In essence, he was arguing that the clear definition and enforcement of rights – as against the vagaries of administrative regulation – is crucial to the movement of resources from less-valued to higher-valued uses. And understanding the complexities of transaction costs is crucial to making the system of property rights operate effectively. Coase’s follower Harold Demsetz would use these ideas to deconstruct the concept of barriers to entry, so widely invoked, and so poorly understood, in S-C-P analysis.¹¹³ Barriers to entry always trace back to property rights, Demsetz showed, and the problem of economic efficiency lies not in obliterating such barriers but in scaling them properly to deal with the relevant economic problem. At the same time, Coase’s earlier and equally famous paper “The Nature of the Firm” from 1937 shed light on vertical arrangements between firms.¹¹⁴ The firm is itself a kind of vertical relationship among technologically separable stages of production, Coase suggested, one that arises to solve problems of transaction costs. It stands to reason that many additional possible arrangements in the vertical chain of production might sometimes be better suited to solving those transaction-cost problems than either simple spot contracts or full vertical integration. As Herbert Hovenkamp put it, “Coasean markets have precisely the same boundaries as Coasean firms.”¹¹⁵

¹¹³ Demsetz (1982).

¹¹⁴ Coase (1937).

¹¹⁵ Hovenkamp (2010, p. 628).

When in 1978 Donald Turner produced a new version of his authoritative treatise on antitrust, this time writing with Phillip Areeda, he had undergone what Hovenkamp calls an “unacknowledged conversion experience” in the direction of the Chicago position.¹¹⁶ The new writings “reflect a greatly diluted concern with entry barriers, dismissed most of the claims that vertical integration was inherently anticompetitive, and proposed greatly relaxed merger standards. They also largely abandoned the view that anticompetitive conduct was a necessary consequence of structure, and they aligned themselves with the Chicago School position requiring closer examination of conduct.”¹¹⁷

How much of the movement in thinking about antitrust policy can we attribute to the ideas of the Chicago School? The decade of the seventies certainly would have been a fertile time for revisionism in antitrust thinking, as it was in so many other areas of American economic thought and practice. The large and impregnable vertically integrated corporations that had once called out for antitrust vigilance now seemed increasingly weak, vulnerable, and decidedly mortal. Competitors both foreign and domestic were sowing havoc. Powerful financial markets were starting to reshape the corporation in ways, and at speeds, that antitrust could not hope to approximate. Nonetheless, there is reason to think that ideas did matter.

In many accounts, the signal antitrust case of the decade was *GTE Sylvania* in 1977, in which the Supreme Court overturned precedent in declaring that territorial restraints

¹¹⁶ Areeda and Turner (1978). The first three volumes appeared in 1978. Subsequent volumes appeared in 1980 and, with Areeda as sole author, in 1986.

¹¹⁷ Hovenkamp (2005, p. 37).

were not illegal *per se* but must be adjudicated under the rule of reason.¹¹⁸ This represented a newly hospitable attitude toward vertical restraints.¹¹⁹ As we have seen, manufacturers often want to impose restrictions to force retailers to compete along non-price margins and to prevent free riding on those who supply services like repair and sales promotion. In this case, Sylvania had licensed only a limited number of distributors of its televisions within each geographical region. Chafing at these limitations, one of the company's larger franchise holders filed suit in 1965. Territorial restrictions had been part of Sylvania's last-ditch strategy to enhance its brand identity. It was losing market share not only to RCA but also to the early Japanese entrants. Three years after the Supreme Court decision, indeed, GTE, like so many other American firms, would exit the TV business, selling the Sylvania brand to Philips of the Netherlands. Yet there is no evidence that it was the shaky state of the American TV industry that changed the minds of the Supreme Court. The decision mentions competitive conditions in the TV industry not at all – but it does cite a number of Chicago economists, including Posner.

Thus, by the time the Reagan administration came to power and Donald Baxter, a devotee of the Chicago view, took charge of the Antitrust Division, much of the late-century change in antitrust thinking had already occurred, and indeed the antitrust policies of the Reagan administration were largely a continuation of trends already instantiated in the antitrust bureaucracy.¹²⁰ Baxter did move to shore up the economics capability of the Division. Under chief economist Lawrence J. White, the agency created new merger

¹¹⁸ *Continental T.V., Inc. v. GTE Sylvania, Inc.*, 433 U.S. 36 (1977).

¹¹⁹ Preston (1989).

¹²⁰ Eisner and Meier (1990).

guidelines to replace those of the Turner era.¹²¹ Significantly, the new guidelines created a procedure to define the concept of “the market” rigorously for antitrust purposes, using the economic ideas of substitution and elasticity. Knowing what actually constitutes the market is an obvious prerequisite for determining whether a market is concentrated. A variable and often irrational definition of markets had been a hallmark of postwar antitrust proceedings, notably including in the massive case against IBM, which by 1982 had been going on for more than a dozen years with almost no oversight from the Justice Department and often little oversight from the presiding judge. The government case routinely “considered not the firms and products that constrained IBM by competing with it but those products and firms that met an arbitrary technical definition,” wrote the economists who had testified on IBM’s behalf.¹²²

As we saw, IBM had succeeded in the market for mainframes because it offered customers a product and services that others could not match. In view of the *Alcoa* dicta, which suggested that a firm was entitled to its market share when that share was acquired solely by “superior skill, foresight, and industry,” the government had to prove that IBM had actually acquired its position by engaging in “anticompetitive” practices. As a result, the prosecution routinely attempted to cast as anticompetitive what was manifestly pro-competitive behavior. “Indeed,” wrote IBM’s economists, “the whole of the government’s case was a reiteration of complaints about *lower* prices and *better* products – the antithesis of what a monopoly produces.”

¹²¹ White (2000).

¹²² Fisher, McGowan, and Greenwood (1983, p. 344).

It came as no surprise to anyone when Baxter dropped the suit as “without merit.”¹²³ The litigation had cost the taxpayers some \$13.4 million, and IBM likely far more. Although IBM’s early competitors in the mainframe category had been but dwarfs, the company was now feeling pressure from rising minicomputer makers like Digital Equipment, Data General, and Prime; and Japanese rivals like Hitachi and Fujitsu were beginning a well-funded assault on mainframes. In 1982, IBM understood that it was in a competitive market. Within a decade, however, the company would learn that the computer industry was far more competitive even than it imagined.

¹²³ Barnaby J. Feder, “End of Action on I.B.M. Follows Erosion of its Dominant Position,” *The New York Times*, January 9, 1982, p. 1.

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