

# Competition in a Network Industry: The Telephone Industry, 1894–1910

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The re-emergence of AT&T as the dominant firm in the telephone industry resulted from its adopting a predatory response to entrants. AT&T's strategy was effective because government regulations and capital market imperfections provided the incumbent with a first-mover advantage that prevented challengers from entering simultaneously in all markets.

Although turn-of-the-century Americans worried a lot about predatory behavior by large-scale businesses, most present-day scholars argue that it was both irrational and rare for large firms to engage in predation. Much of the current scholarship on the extent and rationality of predation can be traced to John McGee's seminal study of predatory pricing by Standard Oil. McGee focused on the Supreme Court case *Standard Oil v. U.S.* because the allegedly predatory practices detailed there played a large role in motivating subsequent legislation and court rulings.<sup>1</sup> Based on his reading of the evidence, McGee concluded that Standard Oil did not drive rivals out of business by initiating price wars and that such predation would have been an irrational strategy for the firm to pursue. He pointed out that by merging with its rival instead of cutting prices, Standard Oil could earn higher profits. Because predation involved an unneeded sacrifice of profits, merger was the preferred strategy. Theoretically, therefore, it seemed unlikely that dominant firms would pursue aggressive pricing strategies.<sup>2</sup>

Despite the dominant influence it has attained, McGee's argument can be challenged on several grounds. First, antitrust laws may preclude

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<sup>1</sup> *Standard Oil v. U.S.*, 221 U.S. 1 (1911).

<sup>2</sup> McGee, "Predatory Price Cutting," p. 137. McGee's influence on the current state of the law is reflected in the Supreme Court's assertion in *Matsushita Electric Industrial Co. v. Zenith Radio Corp.* that "predatory pricing schemes are rarely tried, and even more rarely successful." 475 U.S. 574, 589 (1986).

the merger option. Second, the incumbent may find predation profitable because, by acting aggressively, it can inflict enough financial harm on a rival to yield savings in acquisition costs in excess of its short-term losses. Third, as game theorists have argued, McGee's analysis ignores the strategic value of reputation. A firm supplying multiple markets may be willing to incur losses in one market in order to establish a reputation as an aggressive incumbent. An aggressive response to a first entrant can signal to potential rivals that entry will be unprofitable. It thus can deter entry in other markets and increase future profits.<sup>3</sup>

This article uses the history of the American telephone industry to critique McGee's view of predation. The industry's first firm, the American Telephone and Telegraph Company (AT&T), has been charged with predatory pricing on a number of occasions, but the cases have never been fully litigated.<sup>4</sup> Nevertheless, the general consensus of business historians is that AT&T did not make significant use of predation and that it retained control of the industry during the competitive period 1894 to 1910 because of its superior long-distance network and quality service.<sup>5</sup> These researchers have argued that AT&T's rivals focused on providing inexpensive local service, but this conclusion is based on inadequate research. Many of the entrants, here collectively referred to as the Independents, were in fact committed to providing quality service and building a long-distance market. AT&T's leaders knew this. Indeed, they were well aware that superior service was available from the Independents in certain areas of the Midwest and the West Coast. Both Frederick Fish, AT&T's president during the height of the competitive era, and his successor, Theodore Vail, acknowledged that competition resulted largely from AT&T's failure to develop its markets fully and to provide quality telephone service. In letters to Bell Operating Company executives, Fish frequently emphasized the need to improve the service: "We must give good service and must do everything that is necessary to have good service. Most of our opposition troubles are due, not so much to rates as to two other things,

<sup>3</sup> Ordover and Saloner, "Predation," pp. 350–56; Yamey, "Predatory Price Cutting," p. 129; and Burns, "Predatory Pricing," p. 266.

<sup>4</sup> Koller, who has undertaken the most comprehensive study of federal antitrust cases against alleged predators, did not consider cases in which a consent decree had been reached by the parties. Koller, "Myth," p. 111. The three federal cases filed against AT&T all ended in consent decrees.

<sup>5</sup> Chandler, *Visible Hand*, p. 202–3; Wasserman, *Invention*, pp. 121–22; Langdale, "Growth," p. 145; Federal Communications Commission, *Investigation*, p. 130; and Lipartito, *Bell System*, p. 93, and "System Building," p. 328. Weiman and Levin, "Preying," argue that AT&T attempted predatory pricing in the South but found that its market could be best secured by other means—for example the extension of its network and the use of administrative processes to prevent new entrants from obtaining franchises. In this article, I focus on the entrants' more successful efforts in the Midwest. The extension of AT&T's toll network was not by itself a sufficient means for eliminating AT&T's rivals outside the South. In the Midwest, AT&T's rivals quickly secured a large share of the market despite the company's already extensive toll network.

namely, bad service and not covering the field.” Even where AT&T had successfully developed the market, poor service continued to endanger its position.<sup>6</sup>

In this article I argue that the demise of the Independents, especially in the Midwest, owed more than anything else to predatory actions by AT&T. AT&T chose to use predation rather than acquisition to control the industry because aggressive response to entry in one market deterred potential rivals in other markets. AT&T’s management realized that if it pursued the acquisition strategy suggested by McGee, the compensation provided to rivals would encourage future entry.<sup>7</sup> In order to deter entry, therefore, AT&T set prices at predatory levels in its rivals’ strongest markets. The strategy succeeded, and the rivals were forced to sell their assets at a loss.

#### WHAT CONSTITUTES PREDATION?

Various economic and legal tests exist for predation. Their principal feature is that the predator’s action is intended to drive an equally efficient rival out of business and to scare off potential entrants.<sup>8</sup> The test of predation often used by the courts is to evaluate the relationship between price and either the marginal, average-variable, or total cost of production. Many analysts have pointed out, however, that cost tests are difficult to implement or misleading because the data needed to calculate the cost of production are difficult to obtain and subject to arbitrary cost-allocation decisions. More important, a price below marginal, average-variable, or total cost of production may have nothing to do with predation.<sup>9</sup> For example, at the start of this century, AT&T’s managers believed that residential service should be priced at a rate that was less than the direct cost of service. This “loss” was more than made up by the higher charges that could then be set for business lines.<sup>10</sup> This below-cost price is not an example of predation because the intent was to bring new customers onto the network and thereby raise the value of service to existing customers.

Typically, predation takes the form of a temporary price reduction; but firms can also employ other exclusionary acts, such as predatory use of the administrative process and noisy advertising. By conveying to an entrant that it will have to incur large legal expenses or undertake an expensive advertising campaign, the incumbent raises the rivals pro-

<sup>6</sup> American Telephone and Telegraph Corporate Archive [hereafter AT&TCA], Fish/Burt, Feb. 14, 1903, Presidential Letter Books [hereafter PLB], vol. 26 (quote), and Fish/Glass, Mar. 23, 1903, PLB, vol. 27; and Danielian, *AT&T*, p. 58.

<sup>7</sup> AT&TCA, Fish/Pettengill, Apr. 21, 1902, PLB, vol. 23.

<sup>8</sup> See, for example, Tirole, *Industrial Organization*, p. 373; and Bork, *Antitrust Paradox*, p. 159.

<sup>9</sup> Bork, *Antitrust Paradox*, p. 154; and Tirole, *Industrial Organization*, p. 373.

<sup>10</sup> AT&T, “Conference.”

spective costs and thus reduces the likelihood of entry.<sup>11</sup> Regardless of the method, by causing financial harm to rivals, the predator sends a signal to its existing and future rivals that rivalry will be costly to all parties.

#### THE STRATEGY OF THE INDEPENDENTS

In 1879, after a short period of competition with Western Union, the Bell System gained exclusive control of the telephone industry. Until Alexander Graham Bell's patents expired in 1893 and 1894, AT&T focused on serving the business community in the nation's larger cities. AT&T decided that because the marginal efficiency of capital was higher in more densely populated markets, it would largely ignore rural areas, towns, and smaller cities.<sup>12</sup>

The larger cities were served by AT&T licensees, called Bell Operating Companies. In exchange for the exclusive right to develop the market in a local region, the operating company agreed to provide the parent with 35 percent of its stock, purchase its equipment from AT&T's subsidiary Western Electric, interconnect with AT&T's long-distance network, and allow the parent company to monitor its engineering practices.

During the monopoly era, AT&T's strategy was quite profitable; Robert Bornholz and David Evans have estimated that the firm earned an average annual return on investment of 46 percent.<sup>13</sup> When the patents expired in 1893 and 1894, entrants were attracted to the industry because of the high profits and because AT&T had ignored less densely populated markets and the residential community. Promoters believed that profitable opportunities were available in undeveloped markets as well as those that Bell was already serving. The entrants felt that they would do well in the large cities because of the incumbent's high prices relative to cost, and because customers were dissatisfied with the quality of service on Bell's network.

Like AT&T, the Independents were committed to linking the different exchanges together through a toll network. But the entrants' approach to building a network was significantly different than AT&T's. The founder of one of the leading Independent journals noted that "the Bell people worked from the top down and the Independents from the bottom up."<sup>14</sup> The Independents resolved rate and engineering questions at state and national trade association meetings. At these meetings, voting was controlled by the local exchange companies, rather than the management of a national holding company. No party had the

<sup>11</sup> Salop and Schiffrman, "Raising Rivals' Costs," p. 267.

<sup>12</sup> *Wisconsin Telephone News*, 1 (Dec. 1906), p. 1; and MacMeal, *Story*, p. 24.

<sup>13</sup> Bornholz and Evans, "Early History," p. 25.

<sup>14</sup> MacMeal, *Story*, p. 24.

power to force the numerous Independent exchange companies to adopt a particular practice.

In contrast, decision-making power for AT&T resided at its New York headquarters. By the start of the twentieth century, AT&T had increased its ownership in most Bell Operating Companies to over 50 percent. Its voting power allowed the parent company to standardize procedures more rapidly than the Independents. Nevertheless, there were drawbacks associated with this vertical organizational structure. Independent officials were more aware of local conditions and had greater latitude in adopting policies that met the needs of their communities. As AT&T consultant George Anderson pointed out, local control had been “a substantial factor making for the success” of the Independents.<sup>15</sup>

The Independents did especially well in meeting the demand for telephony in markets that had been neglected by Bell. With the expiration of Bell’s patents, farmers began to purchase telephones from any one of a large number of new manufacturers of telephone equipment. Thereafter, the telephone quickly became a popular item on the farm. It served two general functions: it reduced the level of social isolation and provided a means for quickly contacting merchants in nearby towns.

Between 1894 and 1899, AT&T turned down the request of the companies that served rural America for interconnection with its networks, a policy that encouraged entrepreneurs to establish competitive exchanges. Wholesalers, millers, doctors, and other businessmen who worked in large cities realized that their trades would be aided by establishing an Independent exchange that could reach markets overlooked by AT&T. Such merchants and professionals provided an important source of local capital for the companies that competed with Bell.<sup>16</sup>

Bell’s rivals knew that if they did not construct a long-distance network, they would be unable to attract customers away from Bell or to retain their customers’ patronage. The Independents believed that toll service was highly valued by the business community, and they were keenly aware that their own connections to smaller towns and rural communities provided a competitive advantage in local markets. But in order to secure the patronage of business customers who were engaged in transactions over a larger region, they needed to construct a toll network that rivaled Bell’s in breadth.<sup>17</sup>

<sup>15</sup> Anderson, “Telephone Situation,” p. 67; and Whitney, “Report,” p. 21.

<sup>16</sup> AT&TCA, Allen/Fish, Feb. 16, 1903, Allen Letter Books [hereafter ALB]; and Johnson, “Experience,” p. 580.

<sup>17</sup> Wisconsin State Historical Society [hereafter WSHS], Dane County Telephone Papers [hereafter DCTP], Brown/Harper, Mar. 30, 1898, and Twining/Harper, Oct. 24, 1899; and AT&TCA, Jackson-French, Jan. 16, 1897, box 1277.

The Independents did construct regional networks. These networks were linked together. By 1904, for example, there was Independent toll service between Cleveland and St. Louis. The clarity of conversation on these long-distance networks, however, was often inferior to Bell's, and the lack of trunk lines meant that it took longer to set up a toll call on the Independents' systems. Clarity was inferior because no central organization had dictated construction standards. Consequently, the interconnecting equipment was not always compatible.<sup>18</sup> The Independents tried to solve this problem through their regional and national trade associations, the same mechanism used by the railroads. During trade association meetings, some of the Independents' leaders recommended that high-grade construction procedures be followed. High-quality equipment was recommended and installed because the predominant users of the network, business customers, were more interested in obtaining reliable, rather than cheap service. By 1906, the Independents had succeeded in adopting and implementing uniform standards within their regional networks. For calls over approximately 200 miles, however, the problem of standardization had not been fully resolved.<sup>19</sup>

Capital was needed for the construction of the high-quality trunk lines that could expedite the completion of long-distance calls. The Independents believed that the funds should be raised either by regional toll companies or by a national organization that owned all the regional toll lines. But the toll companies experienced trouble raising capital. Much of their stock was owned by local telephone companies; but despite their recognition of the necessity for constructing a toll network, these companies faced financial constraints that prevented them from making large subscriptions.<sup>20</sup>

Poor accounting practices were responsible for some of the local Independents' financial problems—some of the exchange companies made inadequate allowances for depreciation—but the effects of AT&T's predatory actions were more important.<sup>21</sup> By forcing its rivals to take losses in local markets, AT&T damaged entrants' ability to fund the construction of their toll network or to finance expansion into new markets. For example, AT&T feared that an Independent stronghold in upstate New York would serve as a lever for gaining entry into New York City.<sup>22</sup> Thus, the upstate Bell Operating Companies operated at a loss in order to serve as a "buffer" for the company's profitable New

<sup>18</sup> AT&TCA, Allen/Fish, Dec. 3, 1903, and June 4, 1904, ALB.

<sup>19</sup> "Report of the Fourth Annual Convention"; *Western Electrician*, 2 (Mar. 1, 1902), p. 148; and Nichols, "Result," p. 17. The national trade association meetings were only attended by the larger Independent companies. Because both large and small companies attended the regional meetings, it was within this forum that the most progress was made in establishing uniform operating and construction procedures.

<sup>20</sup> WSHS, Harper/Brester, May 12, 1899, DCTP; and *United Telephone Voice*, May 1921.

<sup>21</sup> Mathews, "Truth," pp. 305–6.

<sup>22</sup> AT&T, "Conference," p. 226.

York City monopoly. Part of the payoff for this strategy came in 1907 when the Independent in Rochester defaulted on its bonds and agreed to sell AT&T its properties.<sup>23</sup> AT&T's acquisition reduced the value of the Independents' properties at nearby exchanges. As a network industry, the strength of each Independent was dependent on the number of customers that could be reached on the Independents' network. The importance of network connections is reflected in the decline of a neighboring telephone company's stock after the Independent in Rochester was acquired by Bell. The Federal Telephone Company of Buffalo, a holding company that operated in Buffalo and elsewhere, saw its stock fall from \$33 to \$13 per share when the Rochester purchase was announced.<sup>24</sup>

The harm done to the Buffalo Independent resulted in part from the Independents organizational structure, in particular the lack of common ownership. An Independent company may have found it in its best interest to sell its properties to Bell, even though the action was harmful to other Independents. The Independents were aware that if exchanges such as Buffalo and Rochester were under common ownership, no one Independent could take action that was in its best interest but harmful to the general interests of the group. They therefore made several attempts to consolidate their operations under one management and to organize an independent, nationwide competitive communications system.<sup>25</sup> The most successful effort was made in 1909, but, as I describe in the next section, it was eventually halted by the predatory behavior of AT&T. AT&T's aggressive pricing was effective because some of its markets were partly protected by barriers to entry. These protected markets helped finance the incumbent's short-term losses in more competitive markets. In the following sections, I describe the source of the barriers—regulatory rules and capital market imperfections that impeded the Independents efforts to establish a ubiquitous network.

#### COMPETITION IN THE MIDWEST

As shown in Table 1, the Midwest was the region where the Independents met with the greatest success. Central Union, one of AT&T's operating subsidiaries in the Midwest, provided service in Indiana, Ohio, and Illinois. Although its service territory included most areas in these states, Chicago, Cincinnati, and Cleveland were served by other Bell Operating Companies.

Regional data underscore the strength of the Independents in the service territory of Central Union. In 1902 Central Union's network

<sup>23</sup> AT&TCA, Vail/Winsor, Mar. 26, 1909 (quote), "Proposed Consolidation," box 47; and *Telephone Securities Weekly*, Apr. 13, 1907.

<sup>24</sup> *Telephone Securities Weekly*, Apr. 7, 1907.

<sup>25</sup> Federal Communications Commission, *Investigation*, pp. 130–32.

TABLE 1  
BELL AND INDEPENDENT MARKET SHARES, 1907  
(percentages)

Region	Bell	Independents	Independents Affiliated with Bell <sup>a</sup>	Bell + Affiliated Independents
United States	51.2	48.8	13.7	64.9
North Atlantic	74.9	25.1	3.3	78.2
South Atlantic	57.2	42.8	7.4	64.7
North Central	33.8	66.2	20.5	54.3
South Central	50.2	49.8	18.6	68.9
Western	71.0	29.0	6.7	77.7

<sup>a</sup> These were Independent stations that exchanged service with the Bell System.

Source: U.S. Department of Commerce, *Telephones and Telegraphs*, 1907, table 10, p. 23.

connected one-third as many subscribers as the Independents. At the end of 1908 it included only 48 percent of all subscribers in its service territory.<sup>26</sup> By 1906 most of the major Independent exchanges (for example Toledo, Cleveland, and Indianapolis) were controlled by a holding company, the United States Telephone Company, whose corporate structure was similar to AT&T's. United States provided long-distance service in Ohio and Michigan and controlled the New Long Distance Company of Indiana. New Long Distance provided toll service in the Hoosier State and, along with United States Telephone, owned approximately 20 local exchange companies.<sup>27</sup> United States's trunk lines connected exchanges in Ohio, Michigan, and Indiana with other regional Independent systems. For example, a subscriber in Indianapolis could connect with the Federal Telephone System to reach Buffalo or with the Kinloch System to reach St. Louis.

The initial success of the Independents in the Midwest was largely due to four factors: improved local service, reduced price, more extensive regional connections, and the public's inclination to support a local firm.<sup>28</sup> Confronted with the Independents' initial success, Central Union attempted to retard its rivals' expansion by adopting rates that the firm's directors believed were "below the cost of doing the business." Central Union operated at a loss in order to protect AT&T's network.<sup>29</sup> According to L. N. Whitney, a superintendent of Central Union and a member of its board of directors, Central "cut [its] rates" as part of a general strategy "to cause every dollar invested in Independent property to be lost." Whitney added that these losses

<sup>26</sup> AT&TCA, Minutes of Director's Meeting, Central Union Telephone Company, Mar. 18, 1908, p. 264; and *Read et al.*, Richardson/Dubois, Jan. 22, 1909, in "Competition, Opposition, Mergers, Connections with Independents," p. 141.

<sup>27</sup> New England Telephone, *Telephone*, pp. 45-49.

<sup>28</sup> Whitney, "Report," p. 15.

<sup>29</sup> AT&TCA, Minutes of Director's Meeting, Central Union Telephone Company, Jan. 20, 1897, p. 237 (quote); and *Read et al.*, "Opinion Rendered by Judge William E. Dever," Jan. 20, 1917 slip. op., p. 41.

served “as a warning to other investors, who might dare to invade the field of the Central Union monopoly.”<sup>30</sup>

In formulating its competitive response in the Midwest, AT&T studied other regions to identify strategic moves that could be used to secure the territory. On the West Coast, under the leadership of John Sabin, the Pacific Telephone Company had encountered little competition. In 1901 AT&T believed that entry had been forestalled in that area because the market had been widely developed through the use of inexpensive, ten-party service (ten customers sharing one connection to the central office).<sup>31</sup> In May 1901 AT&T put Sabin in charge of the Central Union Company. Upon taking control, he converted most of Central’s customer connections from four-party to ten-party service. According to employees of Central and AT&T, this degradation in service increased the public’s interest in obtaining service from the Independents, who mostly offered one- and two-party service.<sup>32</sup>

To the dismay of AT&T’s chief engineer, Joseph Davis, and some other AT&T employees, ten-party service was unprofitable. Davis believed that the operating costs associated with ten-party service were so burdensome that the total cost of providing it was as high or higher than single-party service. But because of its inferior quality, the price for Bell’s service had to be lower. Davis concluded that Central Union was providing service at a loss and advised the president of AT&T that the situation could only be reversed if Sabin was ordered to stop marketing ten-party service. Davis’s proposal was rejected, and not until Sabin died in 1903 did the marketing of ten-party service terminate.<sup>33</sup>

The Independents’ ability to take advantage of AT&T’s strategic error was hindered by two factors. First, Central’s below-cost prices made it difficult for the Independents to generate internal cash for expansion. Second, before service could be started in towns and cities, a franchise had to be obtained from the local government. The franchise often included regulations that were not part of the charter of Central Union or other Bell Operating Companies.

In granting a franchise to an entrant, the cities frequently stipulated maximum rates. The prices reflected the cost of doing business in an exchange that was comparable in size to the incumbent’s. The low entry prices stimulated demand to an extent that had not been anticipated. Under the prevalent mode of manual switching, the cost per subscriber increased as the size of the network expanded. Larger networks

<sup>30</sup> Whitney, “Report,” p. 5 (quote); and *Telephony*, 65 (Nov. 22, 1913), p. 23.

<sup>31</sup> Atwater, “History,” pp. 53, 56, 68, 275. The Independents eventually did well on the West Coast because customers were attracted to their high-quality, one-party service. AT&TCA, Fish/Glass Mar. 23, 1903, PLB, vol. 27.

<sup>32</sup> Atwater, “History,” pp. 78, 89, 275.

<sup>33</sup> Atwater, “History,” pp. 53, 56, 68.

required more expensive switchboards, and operating procedures were more complex, requiring additional manual operations and time. Ironically, since the cost of service per subscriber increased as the number of telephones connected to the network increased, the entrants' success caused them to incur financial losses in some cities.<sup>34</sup> Although the Independents' initial prices were designed to cover their costs, the per-customer cost increased as their systems grew. Because the franchises did not include any mechanism for adjusting the price to reflect the increased cost, the Independents were in jeopardy.<sup>35</sup> But because the promise to sell service at low rates had influenced the granting of the franchise, the cities were reluctant to allow the Independents to raise their rates.

The degree to which city regulations hindered the Independents varied across the states. The Ohio Supreme Court decided in 1905 that the cities did not have the authority to fix rates, and therefore the Independents could adjust their rates to a paying basis.<sup>36</sup> The Indiana courts ruled differently, finding that the rates prescribed in the franchise were enforceable. This decision was especially harmful to the Indianapolis Telephone Company, which started service with rates approximately 50 percent lower than Central's during the monopoly era. The demand for the entrant's service exceeded the promoters' expectations, in part because the Independent also had a strong presence in the toll market. The New Long Distance Company connected Indianapolis subscribers with 48,000 customers in surrounding communities, whereas Central Union only offered access to 19,000 subscribers. The differential was a decided advantage for the Independent because the majority of toll calls were to neighboring communities.<sup>37</sup>

The Indianapolis Telephone Company found that in order to sustain good service, it needed to increase its exchange rates. Unlike Central Union, the Independent could not change its rates without permission from the City. In 1906, after extensive public hearings, the Board of Public Works turned down the request. According to one observer, city officials felt that because the Independent had proposed the original rates, it had to "make the best of a bad bargain."<sup>38</sup>

<sup>34</sup> See, for example, Lee, *Economics*, p. 74.

<sup>35</sup> The Independents' rates were not predatory because the below-cost prices were due to the regulatory process and were not adopted with the intent to drive an equally efficient rival out of business. Where left unconstrained by municipal regulations, the Independents raised their prices to reflect their increasing unit costs. WSHS, J. C. Harper to Wisconsin Railroad Commission, Sept. 1, 1907, series 1344, box 107, file 900.4.

<sup>36</sup> Stehman, *Financial History*, p. 88.

<sup>37</sup> New England Telephone, *Telephone*, pp. 61–63; AT&TCA, Richardson/Caldwell, Nov. 29, 1907, "Indianapolis," B1153; Sears, *Telephone Development*, p. 27; Pickernell/Fish, Oct. 20, 1905, reprinted in Federal Communications Commission Accounting Department, *AT&T Security Investments*, vol. 1, p. 129; and Read et al., "Testimony of Horace Hill," tr. 3037–38.

<sup>38</sup> AT&TCA, N.A., "Brief History of Indianapolis Litigation," "Indianapolis Consolidation," N.D., box 36.

As a result of the insufficient rates, the quality of service offered by Indianapolis Telephone declined.<sup>39</sup> This development coincided with improvements made in the Bell system. When Sabin died in May 1903, he was replaced by L. R. Richardson. Richardson found Central's service throughout the three Midwest states to be "poor." Central's general manager, Horace Hill, found, on the other hand, that the Independents' service was "satisfactory" and "efficient." Richardson decided that in order to win control of the territory, the quality of service on Bell's network had to be improved, and the number of cities connected to its network had to be increased. Advances in the quality of service were noticeable by 1905. Bell's principal advantage had been its superior long-distance connections, and Richardson felt that there was a need to establish a similar advantage in the short-distance toll market. Whereas the Independents had developed strong county systems, Richardson believed that the construction of cross-country toll lines would help improve Central's market position.<sup>40</sup>

While Richardson was upgrading the Central Union network, he took steps to retard the growth of the Independents. The decision of the Indianapolis Board of Works to deny its rate application damaged Indianapolis Telephone, but a more general problem for the Independents was Central Union's decision to operate at a loss until the Independents were driven from the market. Central Union could afford to improve and expand its network while operating at a loss because of the financial support provided by AT&T.

Theodore Vail, AT&T's President, commented that during the competitive era, Central Union stock was "practically valueless," and if not for AT&T's support, the firm would have been "liquidat[ed]." <sup>41</sup> AT&T invested approximately \$30 million between 1898 and 1913, despite the prospect that Central would "have no earning capacity for a long-time." AT&T was willing to make these investments so that "the fight" in places such as Indianapolis, Toledo, and Columbus could "be carried out to a finish." <sup>42</sup> By curtailing or eliminating the profits of the Independents in their strongholds, AT&T was able to forestall their expansion into the monopoly markets of AT&T. <sup>43</sup> From the beginning of competition, a consensus had emerged within the parent organization and among the Bell Operating Companies "that the profit need not

<sup>39</sup> Stehman, *Financial History*, p. 86.

<sup>40</sup> AT&TCA, Richardson/Vail, Feb. 27, 1908, box 1357, (first quote); *Read et al.*, "Testimony of Horace Hill," tr. 3067 (second quote), tr. 3453–54; AT&TCA, Minutes of Board of Directors, Central Union, Mar. 18, 1908, p. 265; and Atwater, "History," p. 135.

<sup>41</sup> *Read et al.*, "Deposition of Theodore N. Vail," Feb. 1915, p. 241.

<sup>42</sup> *Read et al.*, American Telephone and Telegraph, "Brief and Argument for Appellant," Appellate Court of Illinois, First District, Gen. No. 23664, Mar. 1918, p. 2; and AT&TCA, Fish/Sabin, Dec. 24, 1902 (quote only) Private Presidential Letter Books [hereafter PPLB], vol. 2.

<sup>43</sup> *Read et al.*, "Final Decree by Judge William E. Dever," July 10, 1917, p. 77.

necessarily be immediately attached to the particular transaction, but that the company itself profit by what is done.”<sup>44</sup>

Outside of Indianapolis, the Indiana Independents faced different constraints. In their smaller markets, city franchises were less of a limiting factor but prices were important. In Indianapolis, the Independent had a large share of the business market because the entrant had improved the quality of service. In other states, Independents had learned that if they continued to provide quality service, these high-margin customers would retain their service after a price increase. In less dense markets, where price was more of a factor, the Independents believed that it would be difficult to raise their rates unless Bell did the same. The Indiana Telephone Association suggested to Bell that the rivals end their ruinous rate wars. The Indiana Independents wanted to raise their rates to a paying basis, but believed that the rate increase would not be sustainable unless Central Union did the same. Central turned down the proposition and instead commented that competition in the industry “must and will” end.<sup>45</sup> AT&T was not willing to raise its prices to a paying basis until its rivals were eliminated.

Working with F. A. Pickernell, the AT&T official in charge of the parent company’s competitive toll pricing policy, Central Union adopted other predatory tactics designed to limit the Independents’ internal cash flow. Pickernell wrote to Richardson in 1905 that a means should be found to block the Indianapolis Independent from raising money for improvements: “If, by any means, the Indianapolis Telephone Company is prevented from getting money to put its plant in good condition, its earnings will decrease, and I would expect it would not be long before there would be difficulty in obtaining money to meet the fixed charges. This would mean . . . a receivership and a reorganization of the property.”<sup>46</sup>

On March 2, 1909, partly in response to the deterioration of service on Indianapolis Telephone’s network, the city of Indianapolis reversed its earlier position and granted the entrant a rate increase. Central Union, in line with Pickernell’s suggestion, attempted to block this source of additional revenue by providing funding for a legal suit in opposition to the entrant’s rate increase.<sup>47</sup> The Indianapolis suit was limited to the issue of the price for local service, because the city did not have the authority to regulate intercity (toll) rates. The outcome of litigation over

<sup>44</sup> AT&T, “Conference,” p. 157.

<sup>45</sup> *Central Union News*, 3 (Feb. 1908), p. 8.

<sup>46</sup> *Read et al.*, Pickernell/Richardson, Oct., 13, 1905, reprinted in “Competition, Opposition, Mergers, Connection with Independents,” p. 56 (quote); and AT&TCA, Fish/Caldwell, Dec. 1, 1905, PLB vol. 41.

<sup>47</sup> AT&TCA, N.A., “Brief History of Indianapolis Litigation,” N.D.; and *Telephony*, 18 (Sept. 25, 1909), p. 317. Elsewhere, AT&T surreptitiously fought rate increases of the Independents in Court. See, for example, AT&TCA, Fish/Bethell, Dec. 23, 1902, PPLB vol. 2, and Fish/Yensen, June 26 and June 30, 1902, PLB, vol. 21.

local rates became immaterial when, on May 1, 1909, Central Union and AT&T reduced their rates on competitive toll lines. As described in the next section, this predatory rate reduction led to the sale of the Indianapolis exchange and other United States properties to an agent of AT&T.

#### CONTROL OF THE LONG-DISTANCE MARKET

In 1909 the Independents took an important step to overcome the dearth of long-distance trunk lines. They had already established regional networks in the Midwest, the Middle Atlantic States, upstate New York, and on the West Coast, and in the spring of 1909 the Independent Long Distance Telephone and Telegraph Syndicate took steps to unite the regional systems into a national network and increase the number of long-distance trunk lines. By mid-April the national toll company had either signed or was in the final stages of signing contracts with the nine regional Independent toll companies providing service east of the Rockies.<sup>48</sup>

This development concerned AT&T, for the regional toll companies had captured some of its traffic. At Buffalo, for example, the message growth rate on AT&T's monopoly toll routes was 26.5 percent for the three-year period ending March 1909, but only 9.6 percent on its competitive routes.<sup>49</sup> The growth of the Independents' toll network cut into Bell's profits as well as its traffic. Furthermore, Pickernell believed that the Independents' toll lines were often profitable, and their expansion was improving the position of the Independent exchange companies. He attributed the success of the regional Independent toll system in New York and elsewhere to four factors: the Independents had more customers in some exchanges, lower day rates, and offered both evening- and bulk-toll-rate discounts (neither of which were made available by AT&T). Pickernell believed that the cumulative effect of these advantages "ha[d] been considerable," as it had "rob[bed] the Bell system of a substantial amount of toll traffic, thus not only assisting the revenue of the opposition but greatly increasing its prestige with the more important telephone customers."<sup>50</sup>

Because of the threat the Independents posed to AT&T, Pickernell felt that AT&T "ought to do everything possible to hasten the downfall of the opposition in order that [their properties] may be purchased at a low price and merged with the Bell." AT&T had to do more than just match the rates of the Independents, for on heavily used routes, division of traffic at the Independents' rates would still be profitable for the

<sup>48</sup> AT&TCA, Contract United States Telephone with Max Koehler, Apr. 19, 1909, box 36; and *Telephony*, 19 (Mar. 26, 1910), p. 380.

<sup>49</sup> AT&TCA, Pickernell/Hall, May 21, 1909, B1376.

<sup>50</sup> *Ibid.*

Independents. Pickernell convinced AT&T officials to “attack” the Independents’ most profitable lines, postulating that if the number of stations at two network nodes were essentially equal, the traffic would follow the rate.<sup>51</sup>

Pickernell advocated adopting rates that were lower than the Independents and that, if the Independent matched the price reduction, AT&T should “cut the rate again to a point that will control, or if [the Independent Toll Company] is losing money at least divide the traffic.” AT&T’s competitive toll-pricing policy architect argued that his plan would “enormously impair the earnings of the competitor with comparatively slight loss to the Bell company.” The up to 50 percent price reductions would only be applied at competitive points. Pickernell thought that at the reduced rates, AT&T’s earnings on competitive routes would be below the cost of money. He reckoned that because of AT&T’s earnings in monopoly markets, there would be only a slight reduction in the firm’s overall earnings. But the losses from a price war could push the opposition into receivership, and this would provide Bell with the opportunity to acquire its rivals and re-establish rates at the existing level.<sup>52</sup>

Pickernell’s letters do not indicate the magnitude of the short-term loss that he thought might result from the price reduction. However, a letter written by B. Sunny, the president of the Bell Operating Company in Chicago, suggests that the forecasted annual loss to Central Union from a proposed rate cut that was being debated within AT&T in April 1909 may have been as little as \$140,000. Sunny, in a letter to the president of AT&T, argued that losses at the Independents’ strongholds in Ohio and Indiana were sensible because of the system-wide benefits to AT&T. By taking these losses, Central Union would prevent its rivals from operating profitably. If the existing Independents sustained losses, it would diminish their opportunity to expand into markets such as Chicago or to raise money internally for their toll lines. Naturally, a poor return on existing investments would also hurt the Independents’ ability to raise money from external sources. Thus, Sunny wrote, the losses of Central Union were in the best interest of AT&T because they would help “‘exterminat[e]’ ” United States Telephone, a firm that was “‘a menace to our whole organization.’ ”<sup>53</sup>

In May 1909 Pickernell’s policy was implemented. On competitive toll routes in the Central Union territory, as well as at other competitive points that were to be part of the Syndicate’s emerging network, rates were cut by approximately one-third. The rate cuts were seen by the newspapers as an attempt to “checkmate” the Independents’ national

<sup>51</sup> Ibid. (quote); and AT&TCA, Pickernell/Hall, May 12, 1909, B1376.

<sup>52</sup> Ibid.

<sup>53</sup> *Read et al.*, Sunny/Vail, Apr. 1, 1909, quoted in “Opinion Rendered by Judge William E. Dever,” Jan. 20, 1917, pp. 135–36, and Testimony of Frank F. Fowle, tr. 633–35.

TABLE 2  
IMPACT OF RATE REDUCTION IN 20 OHIO CITIES: TOLL MESSAGES AND  
REVENUES, SEPTEMBER 1908 AND SEPTEMBER 1909

	September 1908	September 1909	Percent Change
Messages			
Outward Central Union messages to reduced points	34,001	52,041	53.1
Outward Central Union messages to nonreduced points	26,766	29,783	11.3
Outward AT&T messages to reduced points	13,000	20,120	54.8
Outward AT&T messages to nonreduced points	5,196	6,650	28.0
Revenues (\$)			
Central Union message revenue to reduced points	10,916	9,554	–12.5
Central Union message revenue to nonreduced points	5,271	5,628	6.8
AT&T message revenue to reduced points	9,662	9,152	–5.3
AT&T message revenue to nonreduced points	7,293	9,184	25.9

Source: AT&TCA, Thayer/Vail, Nov. 18, 1909, B2019, “Long Lines Department.”

toll system.<sup>54</sup> When the price cuts were matched by United States Telephone, AT&T and Central Union cut their toll rates an additional third. The Independent did not match the second reduction because operations at that level would have meant doing business at a price that was less than the cost of business.<sup>55</sup>

Since AT&T’s toll rates were now lower, United States Telephone could not continue in business. As Pickernell forecasted, traffic indeed followed the rate. The effect of the toll cut on Bell’s traffic is shown in Table 2. Message volume increased by 54 percent on the short-haul routes of Central Union and the long-haul routes of AT&T. The rate reduction led to a short-term reduction in AT&T’s profits. Despite the large increase in traffic, revenue declined.<sup>56</sup> In order to characterize an act as predatory, the aggressor must sacrifice short-term profits in order to increase long-term earnings. Because revenues declined, and AT&T’s intent was to drive an efficient rival out of business, the price reduction was clearly predatory. Predation may also be inferred by looking at the price-cost relationship on competitive toll routes. Phillip Areeda and Donald Turner have argued that predation may be inferred

<sup>54</sup> *Daily Telephone News*, May, 4, 1909.

<sup>55</sup> *Telephony*, 18 (Aug., 21, 1909), p. 182, and 19 (Jan. 8, 1910), p. 53. United States Telephone did not indicate if the price was less than its average total or variable cost. The firm merely stated that operations were unprofitable at that level.

<sup>56</sup> The data also indicate the extent of toll competition. In 1908, 71 percent of the messages sent over AT&T’s long-distance lines could have reached the same destination over the rivals’ network. On short-distance toll calls, the option was only available for 56 percent of the traffic. The difference may be attributable to there being a lower likelihood of competition in small cities and towns. The long-haul traffic may have been between large cities.

TABLE 3  
PRICE/COST RELATIONSHIP: AT&T'S COMPETITIVE LONG-DISTANCE TOLL  
ROUTES, SEPTEMBER 1908 AND SEPTEMBER 1909  
(dollars)

	September 1908	September 1909
Revenue per message to reduced points <sup>a</sup>	0.743	0.455
Revenue per message to nonreduced points <sup>a</sup>	1.404	1.381
Nationwide average-variable cost per message	n.a.	0.48
Nationwide average-total cost per message <sup>b</sup>	n.a.	0.753

<sup>a</sup> Revenues are for messages originating in Ohio.

<sup>b</sup> Averages are calculated on the basis of variable cost plus depreciation and return on investment.

Note: n.a. = not available.

Source: AT&TCA, Thayer/Vail, Nov. 18, 1909, B2019, "Long Lines Department."

when prices are set below the average-variable cost.<sup>57</sup> Although region-specific cost data are unavailable, the available information suggests that AT&T's rates were below its variable cost of production. As shown in Table 3, the average revenue per message originating in Ohio was \$0.455, \$0.025 less than AT&T's nationwide average-variable cost per message.

Facing the prospect of future losses, United States agreed in October 1909 to sell its toll and exchange properties. In light of a recent circuit court's decision that found Standard Oil in violation of the Sherman Anti-Trust Act, AT&T was apprehensive that the Department of Justice might object to the acquisition of its former rival and therefore did not directly take over ownership of the properties.<sup>58</sup> Instead, it provided the R. L. Day Company with the funds for the purchase. The sale effectively put AT&T's market share at 100 percent in the territory formerly served by United States. After Day took over control of the Company, toll rates returned to their pre-May 1909 level.<sup>59</sup>

By adopting predatory prices, AT&T had succeeded in obtaining "key" properties at a fire-sale price. The United States's lines accounted for slightly over 50 percent of the regional Independent toll-line mileage. Day paid \$7.3 million for the properties. AT&T's comptroller calculated that the value of the property was \$12.85 million, a calculation based on both the earnings of the properties prior to the rate war, and the reproduction cost of the property. The two methodologies provided essentially the same result.<sup>60</sup>

<sup>57</sup> Areeda and Turner, "Predatory Pricing." Areeda and Turner's is but one of many tests for predation that exist in the law and economics literature. I have used their yardstick not because it is necessarily the most appropriate but because it is the most widely cited and one of the hardest to pass. For example, by comparison, Joskow and Klevorick have proposed a less stringent test that compares price with the average cost of production (Joskow and Klevorick, "Framework," p. 213).

<sup>58</sup> *Telephony*, 19 (Feb. 22, 1910), p. 186; and *Standard Oil v. United States*, 173 Fed. 177.

<sup>59</sup> *Telephony*, 19 (Mar. 26, 1910), p. 386.

<sup>60</sup> Sunny/Vail, Nov. 19, 1909 (quote), reprinted in Federal Communications Commission,

For a multimarket firm, the payoff from predation may extend beyond being able to buy out a rival at a low price. By establishing a reputation for predatory actions, the supplier is able to induce other rivals to take actions favorable to the incumbent. AT&T's toll-rate reduction in Ohio helped it secure control of St. Louis in the Fall of 1909. St. Louis was served by Bell of Missouri and the Kinloch Telephone Company. Kinloch had more toll connections to nearby points and consequently had higher per-station toll revenue. Financially, Kinloch was also more profitable. Pickernell estimated that, after proper allowance for depreciation, the entrant's return on actual dollars invested was 6.7 percent, 360 basis points more than Bell's rate of return. Kinloch's return was higher despite having effectively lower rate levels. The anomaly was the result of the entrant having lower maintenance and operator costs, as well as less spare capacity per subscriber.<sup>61</sup>

In 1908 Kinloch added 3,724 customers whereas Bell gained only 297 subscribers. AT&T felt that some action had to be taken in light of its rival's gains and the prospect that Kinloch would be able to expand further in the future. In August 1909 Bell replaced its measured service with Kinloch's flat-rate structure and levels. AT&T anticipated that because of increased expenses and the reduction in revenue, the change of rates would lead to a short-term financial loss of \$250,000. Although AT&T executives expected that the revenue effect would be positive within a year, they did not believe that the new rates would provide a satisfactory rate of return in the long run.<sup>62</sup>

When Bell adopted the Kinloch rates, the entrant did not respond with a price reduction. Once the firm lost its status as the low-price supplier, however, its market share declined. Kinloch left its rates intact because it did not wish to enter "a vigorous rate war . . . similar to the Ohio campaign." Instead, despite its strong financial position, the firm exhibited an increased willingness to sell its properties to AT&T. The elimination of United States as a rival also increased the willingness of other Independents in such states as Ohio, Missouri, and Kansas to join the Bell network through a license contract.<sup>63</sup>

Ironically, the most serious legal challenge to AT&T's predatory actions was taken by some minority stockholders of Central Union, where AT&T was the majority stockholder.<sup>64</sup> Central's aggressive

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*Control*, vol. 3, p. 174; and AT&TCA, DuBois/Vail, Oct. 12, 1909, "Ohio Consolidation," box 36. Burns, "Predatory Pricing," has provided an econometric estimation of the impact predation had on the prices of tobacco manufacturers acquired by American Tobacco. I am unable to employ Burns's methodology because of the lack of financial data for the overwhelming majority of firms acquired by AT&T.

<sup>61</sup> AT&TCA, Thayer/Durant, Feb. 24, 1909, and Pickernell/Thayer, June 2, 1909, box 4.

<sup>62</sup> *Ibid.*; and AT&TCA, Pickernell/Thayer, June 7, 1909, box 4.

<sup>63</sup> AT&TCA. Calhoun/Brooke, Jan. 18, 1910 (quote), and Transcript of Conversation between Calhoun and Brooks/Wilson, Mar. 23, 1910, box 4; and *Telephony*, 19 (Mar. 26, 1910), p. 377.

<sup>64</sup> Federal and State agencies considered blocking the sale of U.S. Telephone properties, but no

response to entry was in the best interest of AT&T, but the reverse was true for its minority stockholders. During the competitive era Central operated at a loss, paid no dividends, and the stock sold below par. In *Read et al. v. Central Union*, the judge found that the decision of Central Union to respond aggressively to entry, rather than act as a cooperative duopolist, hurt the minority stockholders of Central Union. The jurist noted that Central Union had “borne the full burden of this expensive fight.” The decision of Central Union’s directors to adopt policies that were in the interest of AT&T rather than that of the firm was a violation of their fiduciary responsibilities. For this reason, along with other fiduciary violations and AT&T’s attempt to monopolize the telephone market, the judge ordered AT&T to sell its holdings in Central Union. The sale did not occur, because prior to the end of the appeals process, an out-of-court settlement was reached between the firm and the plaintiffs. AT&T agreed to pay the minority stockholders \$1.75 million for 1,978.5 shares. The stock had a par value of \$197,850 and a market value of approximately \$90,000.<sup>65</sup>

#### THE INDEPENDENTS’ FAILED EFFORT TO ENTER AT&T’S MONOPOLY MARKETS

##### *Regulatory Barriers to Entry*

When the Indianapolis Telephone Company obtained its franchise, it did not anticipate how the setting of its local rates by the city would harm its long-term prospects. The Indianapolis maximum-rate rules were but one of many seemingly innocuous state and local rules that severely damaged the Independents. In this section, I explain how

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action was taken. In December 1909, in anticipation of legal action, R. L. Day Company informed AT&T that it no longer wanted to hold the properties. Upon hearing this news, AT&T asked J. P. Morgan & Co. to take control of the properties. AT&T informed Morgan that a transaction had to occur quickly, and therefore the investment firm abandoned its standard procedure of determining the value of the properties. Morgan/Vail, Aug. 9, 1915, reprinted in Federal Communications Commission, *Report*, vol. 3, appendix 16, p. 24. The antitrust authorities apparently dropped the investigation after an officer from Morgan submitted a sworn affidavit stating that the purchase had been made “ ‘as an investment . . . with its own moneys,’ ” and that there was no agreement with AT&T regarding the control or management of United States Telephone, nor an arrangement to lessen the extent of competition. *Telephony*, 9 (Jan. 22, 1910), p. 88, and 55 (July 16, 1910), p. 57.

<sup>65</sup> *Read et al.*, “Final Decree by Judge William E. Dever,” July 10, 1917; and Read/Kingsbury, Apr. 4, 1919, reprinted in Federal Communications Commission, *AT&T Security Investments*, vol. 1, appendix 9, p. 16. A similar suit was almost filed in New York. AT&T had feared that an Independent stronghold in upstate New York would serve as a lever for gaining entry into New York City. The upstate Bell Operating Companies operated at a loss in order to protect AT&T’s profitable New York City monopoly. Because of these predatory losses, the minority stockholders of the upstate New York Bell Operating Companies threatened to sue AT&T for violating its fiduciary responsibilities. The suit was not filed because AT&T provided satisfactory compensation when these upstate companies were merged with the profitable downstate firms. AT&TCA, Vail/Gould, Apr. 3, 1908, PPLB, vol. 6.

regulatory barriers to entry impeded the Independents' ability to expand into AT&T's most profitable markets.

The Independents had to establish exchanges in New York, Chicago, and other monopoly markets of the incumbent in order to counter Bell's expansion, improved service, and predatory actions.<sup>66</sup> AT&T's expansion had been funded in part with borrowed money, and a substantial portion of this capital was invested in areas where the Independents were strong. Because of this competition, the investment "[did] not bring back proper return."<sup>67</sup> If AT&T's monopoly exchanges lost their ability to cover these losses, the firm would have had difficulty repaying its loans. As aptly noted by a New York City official, the high returns in monopoly exchanges "seem[ed] to invite competition."<sup>68</sup> In 1905 the Independents were busily trying to enter the large cities in which AT&T still held monopolies. Entry conditions were ripe. There was strong public interest in the establishment of Independent exchanges, and because AT&T's resources were strained, the firm would have found it difficult to respond aggressively toward new rivals.<sup>69</sup> In some cities franchise procurement was dependent on the outcome of a public referendum. In 1906 and 1907 referendums were held in Denver, Omaha, Portland (Oregon), and San Francisco, and an overwhelming majority of people voted to grant the Independents franchises. In New York City, there was widespread dissatisfaction with Bell's prices and rate structure. Chicago residents also expressed keen support for the Independents because of the toll connections that would become available to those markets the Independents controlled.<sup>70</sup>

Entry into AT&T's monopoly markets was, however, impeded by state and local regulations. Municipal officials were aware of Bell's large earnings during the patent period. This, along with the heated bidding between promoters, made it clear that a telephone franchise was a highly valued, intangible property. City officials in the early twentieth century, unlike those in the 1870s, were not going to give this right away without imposing conditions. When franchises were issued to the Independents, therefore, they typically included stipulations that set maximum rates, required free telephone service to the city government, free use of the telephone poles and underground conduits for fire and

<sup>66</sup> WSHS, "To the Citizens of Madison: Statement Issued by Dane County Telephone," 1906; and Whitney, "Report," p. 32.

<sup>67</sup> AT&TCA, Fish/Pickernell, Aug. 3, 1906, PPLB, vol. 5 (quote); and Garnet, *Telephone Enterprise*, p. 192, fn.11.

<sup>68</sup> Nichols, "Report," p. 22 (quote).

<sup>69</sup> Garnet, *Telephone Enterprise*, p. 127.

<sup>70</sup> *Western Electrician*, July 1, 1905, p. 11, and Mar. 3, 1906, p. 184; AT&TCA, Fish/Burt, July 29, 1905, PLB, vol. 40; *Telephony*, Dec. 1906, p. 358; Weik, "Telephone Movement," pp. 267–68; *City Record*, June 25, 1907, p. 1; *Daily Telephone News* (1905 issues); and Richardson/Fish, Oct. 16, 1901, reproduced in Atwater, "History," p. 76.

police lines, and royalty fees.<sup>71</sup> These regulations constituted a barrier to new entry because they were not imposed on Bell as well. Many of Bell's franchises had been granted when telephony was new and its commercial value uncertain. They therefore did not include similar requirements.

The establishment of these barriers owed to a mixture of three factors. First, as just described, cities were seeking to share the profits from the rapidly growing service. Second, as I will show, laws and franchises were granted that had unanticipated deleterious effects on entrants. Finally, Bell successfully lobbied (at times illegally) for municipal rules that were harmful to entrants.<sup>72</sup>

The Independents considered New York City the "keystone" of the Bell System, as Manhattan alone accounted for approximately one-fifth of all Bell Operating Company profits in 1903. Such a lucrative market invited repeated but unsuccessful Independent challenges to AT&T's monopoly position.<sup>73</sup> New York Electric Lines, for instance, failed to gain entry because a state court ruled that the city was required by contract to compel joint use of the conduit owned by the Empire Subway Company, a subsidiary of AT&T. An 1884 state law had required the placement of utility wires underground. At that time, underground transmission was experimental, and therefore it was difficult to raise capital for the construction of the conduits. Empire Subway had agreed to build the subways on the condition that New York City require other utilities to use their conduit. Empire agreed to make space open to others when it was available and to rent the space at a "reasonable rate." No procedure was established to determine what constituted a reasonable rate.<sup>74</sup> Neither New York Electric Lines, nor any other entrant, wanted to rely on Empire for subway space. When the potential entrants did attempt to rent space, they were usually told it was unavailable. When Empire made space available, the rates appeared to be unreasonably high.<sup>75</sup> Despite these unfavorable entry conditions, the court's ruling left the Independents with no alternative.

The last major Independent effort to enter New York City was made by the Atlantic Telephone Company in 1907. The Board of Estimate and

<sup>71</sup> See, for example, AT&TCA, "Ordinance Granting Telephone Franchise to Automatic Telephone Company by Board of Public Works," New Bedford, June 27, 1899.

<sup>72</sup> Hendrick, *Age*, p. 123. For example, Louis Glass, Vice-President of Bell's Pacific Telephone Company, was convicted of giving bribes to the City of San Francisco supervisors in exchange for their refusal to grant a franchise to an Independent. *Telephone Securities Weekly*, Sept. 7, 1907, p. 3.

<sup>73</sup> Latzke, *Fight*, p. 12 (quote); and AT&TCA, Hall/Fish, July 24, 1904, box 1348.

<sup>74</sup> *People ex. rel. New York Electric Lines Co. v. Ellison*, 81 Northeastern Reporter 447, 449 (1907); New York Laws of 1884, chap. 534; New York Laws of 1885, chap. 499; and AT&TCA, Merchants' Association of New York, "Inquiry Into Telephone Service and Rates in New York City" (1905), p. 15, box 1019.

<sup>75</sup> *New York Tribune*, Mar. 15, 1905; and Federal Communications Commission, *Report*, vol. 3, appendix 14.

Apportionment granted Atlantic a franchise in June, but conditions included in the franchise prevented the company from beginning construction. Like New York Electric Lines, Atlantic had to rent conduit space from Empire. In addition, it had to pay an initial \$250,000 licensing fee and had to obtain the permission of the Board of Alderman in order to issue stocks or bonds. Bell was not subject to either of these requirements.<sup>76</sup> The fee was included in the franchise because the city believed that the license had an “inestimable value” to the Independents and that the local government should get a share of the gains. The regulation of stocks and bonds was made part of the franchise because of the city’s belief that “[n]early all the complaints against public service corporations [were] traceable to over-capitalization.”<sup>77</sup>

A fourth clause included in Atlantic’s franchise contract best illustrates the kind of difficulties encountered by entrants to the New York City market. After receiving the franchise, Atlantic had only six months to show city officials contracts that established toll connections to all cities with populations greater than 4,000 people within a 1,000 mile radius. Failure to meet this, or any other condition, was grounds for charter revocation. This toll-connection stipulation required Atlantic to offer its subscribers the same ubiquitous service available on the Bell network. Although supplying this level of service was certainly an objective of the Independent movement, in the short-term it was virtually impossible to achieve. Individually and collectively, regulatory barriers to entry increased the risk of constructing an Independent exchange in New York. Since the franchise requirement of toll connections to cities within a 1,000 mile radius could not be met, potential investors faced the threat that the Independents’ New York franchises would be revoked.

Nearby Connecticut passed a law in 1899 that essentially established an unregulated telephone monopoly. At that time, the legislature was considering a request from the Independents for a corporate charter to do business in the state. Extensive hearings in which the Independents and Bell argued over the merits of rival networks led only to a stalemate. Finally, the Independents and Bell agreed that the substantive issue of opening up the market should be considered by some other party than the legislature. With the support of both parties, the legislature passed a law requiring an entrant to obtain a special charter from the Connecticut legislature, as well as a superior state court finding that competition was justified by public necessity. Eight years later, when it was apparent that the 1899 law was a barrier to entry, the Independents claimed that neither they nor the legislature had understood that the law would stifle competition. Although a 1907 amendment to the law removed the

<sup>76</sup> *City Record*, June 25, 1907, pp. 3–4; and *Telephone Securities Weekly*, June 29, 1907. Eight months later, the city agreed to modify the license fee. *ibid.*, Feb. 22, 1908, p. 5.

<sup>77</sup> *City Record*, May 1, 1906, pp. 3–5.

requirement of a state charter, the need to obtain a court finding was still a significant impediment to entry.<sup>78</sup> For example, investors believed that the law raised their level of risk, and as a result, they were reluctant to provide any financing until this barrier was removed.<sup>79</sup> Moreover, the procedure forced entrants to reveal information that Bell could use to improve its operations while the court was considering their petitions.

The Connecticut law was but one of many regulatory barriers that prevented the Independents from constructing a ubiquitous network. A combination of municipal and court rulings blocked the Independents' efforts to establish exchanges in Boston and Chicago. The Board of Alderman of Boston granted an Independent the right to install telephone lines on specific streets in 1906, but construction could not begin until the legality of the permit was validated. In 1909, the Massachusetts State Supreme Court ruled that the grant was unconstitutionally vague because "[n]o specific part of any street [was] designated."<sup>80</sup> In 1907, the Chicago City council rejected an Independent firm's petition to construct an exchange. The Council found that the proposed rates were unreasonably low and therefore concluded that the petition was not credible.<sup>81</sup>

### *Capital Markets*

AT&T's aggressive response to the Independents impaired the entrants' ability to raise capital internally. Funds were needed for entering new markets and for expanding the size of existing facilities. Lacking sufficient internally generated funds, the Independents attempted to raise money from the nation's capital markets. Their effort was impeded, however, by their poor earnings records, by franchise requirements, and by capital market imperfections.

The Independents spent considerable effort trying to raise capital in New York. Their securities were not traded on the New York market and they believed that one reason for this was that they had had less direct contact with the East.<sup>82</sup> Although there were many financial magazines and newspapers during this period, little coverage was given to the Independents. Nor were there any major security-rating services that could help investors evaluate the financial standing of the Independents. Moody's, for example, did not directly rate the soundness of different securities but merely suggested that investors learn from the habits of more sophisticated buyers. *Moody's Classified Investments* advised that an investor could infer that a security was relatively safe if

<sup>78</sup> Laws of Connecticut 1899, chap. 158, and 1907, chap. 245; Connecticut Legislature, *Connecticut Judiciary Hearings* (1905), pp. 616–17, and (1907), pp. 16, 149–55, 763–64.

<sup>79</sup> *Commercial and Financial Chronicle*, 69 (Dec. 16, 1899), p. 1223.

<sup>80</sup> *Metropolitan Home Telephone Company v. Emerson*, 202 Mass. 402, 403 (1909).

<sup>81</sup> *Telephone Securities Weekly*, Jan. 11, 1908, p. 3.

<sup>82</sup> Weik, "Telephone Movement," pp. 267–68.

leading banks and financial institutions included the item in their portfolios. The investment manual presented a list of the securities held by large institutions. Unlike Bell's, the Independents' securities were not widely held by the large financial institutions in the East.<sup>83</sup> Based on the information found in Moody's, an investor could conclude that Independent securities were relatively risky as compared to Bell's. If risk-averse small- and medium-sized investors relied on Moody's investment method, the Independents would need to convince large financial institutions to invest in their securities before small investors would be willing to invest in their companies.

The large investors, however, were closely allied in their support of AT&T. Firms such as J. P. Morgan and Kidder Peabody sought to establish industrial order. This translated into providing financing for only one firm—AT&T. To do otherwise would have promoted competition. These underwriters were closely tied with other large financiers, and they used these connections to deny the Independents access to funds.<sup>84</sup> For example, in 1902, George Sheldon, a member of the New York Stock Exchange, decided to help provide the financing for an Independent company in Milwaukee. When the president of AT&T learned of this, he asked an official of J. P. Morgan & Co. to talk to Sheldon about withdrawing his support. Sheldon was subsequently visited by George F. Baker of the First National Bank and George W. Perkins of J. P. Morgan and Co. According to Sheldon, Baker and Perkins convinced him that he "could not be in the position of actively pushing an opposition to their interests in Milwaukee." He withdrew his support. After Sheldon dropped out, the Independents' effort to establish an exchange in Milwaukee collapsed.<sup>85</sup>

AT&T's President Fish frequently relied on business associations in the financial community, industry, and other public utilities to interfere with the Independents' expansion plans.<sup>86</sup> Particularly threatening to AT&T was the possibility that the Independents would rent space on telegraph-company poles, a move that would have reduced the cost of establishing a toll network. Western Union and Postal Telegraph agreed not to rent the Independents space; in exchange, AT&T promised that it would not let one telegraph company use AT&T's facilities for the

<sup>83</sup> *Moody's Classified Investments*, pp. 7–8.

<sup>84</sup> *Read et al.*, "Testimony of Leroy Kellogg," tr. 8464, 8519; *Moody, Masters*, pp. 117–18; *Keller, Life Insurance Enterprise*; *Redlich, Molding*, vol. 2, pp. 379–80; and *Carosso, Morgans*.

<sup>85</sup> AT&T compensated Sheldon for the expenses he had incurred in support of the Independents. AT&TCA, Fish/Steele, June 19, 1902, PPLB, vol. 1, Fish/Sheldon, Jan. 23, 1903, PLB, vol. 26, and Sheldon/Fish, July 30, 1902 (quote), box 66.

<sup>86</sup> See, for example, AT&TCA, Fish/Burt, Aug. 19, 1905, PLB, vol. 40, Fish/Waterbury, Oct. 4, 1902, PPLB, vol. 1, and Fish/Thayer, Apr. 18, 1902, PLB, vol. 20.

purpose of getting into territory controlled by another telegraph company.<sup>87</sup>

The incumbent also used strategic acquisitions to impede entrants' access to capital. AT&T was aware that in large cities telephone manufacturers would install equipment for the Independents in exchange for their stocks and bonds. In part to end this source of financing, AT&T purchased two of the leading Independent manufacturers, Stromberg-Carlson and Kellogg Manufacturing. AT&T controlled Kellogg from 1902 to 1909, when the holding was found to be a restraint of trade, and AT&T was ordered to sell the properties.<sup>88</sup>

Unable to raise money in the East, the Independents had to rely on regional stock exchanges in Cincinnati, Columbus, St. Louis, Toledo, Minneapolis, and Cleveland. These exchanges, however, were inadequate for the task. For example, Cleveland was one of the largest regional stock exchanges, but in 1906 the number of shares traded there was less than 1 percent of the volume traded on the New York Stock Exchange.<sup>89</sup> It was not feasible for these smaller markets to handle the large capital requirements of a telephone network.

Regardless of whether the market was in the East or the Midwest, investors were aware that AT&T had a major institutional advantage over its competitor. A critical criterion used by "conservative bankers" to evaluate the financial soundness of a public utility was to measure how its franchise compared with that of its rival.<sup>90</sup> Since the Independents' franchises often included regulations that were not part of the Bell Operating Companies' permits, the Independents' securities were a more risky investment.

#### THE POSTCOMPETITIVE YEARS

According to McGee, even if a dominant firm engages in predation, society's welfare may increase. Customers benefit from low prices, and these gains may exceed the losses that occur if the predator gains monopoly power.<sup>91</sup> AT&T's below-cost pricing did provide some short-run benefits, boosting the number of subscribers on AT&T's network as new customers were attracted by the low prices. But this rapid development ended with the disappearance of the Independents. As shown in Table 4, telephone growth was at its peak during the competitive era. With the demise of the Independents, AT&T's commercial department no longer had the same incentive to seek new

<sup>87</sup> AT&TCA, Fish/Chandler, Feb. 13, 1907, PLB, vol. 47, and Fish/Clowry, Jan. 31, 1905, PLB, vol. 37.

<sup>88</sup> *Dunbar v. American Telephone and Telegraph*, 238 Illinois 456, 478-81 (1909).

<sup>89</sup> *Journal of Commerce and Commercial Bulletin*, Jan. 3, 1907; and *Finance*, Feb. 9, 1907.

<sup>90</sup> Vanderlip Collection, Frank A. Vanderlip, "Address to National Electric Light Association," June 1909, box D-13.

<sup>91</sup> McGee, "Predatory Pricing," p. 168.

TABLE 4  
TELEPHONES PER 1,000 POPULATION: RATES OF GROWTH, 1885–1929

Years	Percent Growth
1885–1893	4.6
1894–1907	20.6
1908–1912	5.5
1913–1917	3.9
1918–1929	3.1

Source: U.S. Department of Commerce, *Historical Statistics*, vol. 2, p. 783.

customers. The slow rate of development during the post-competition years occurred despite a low level of telephone penetration—in 1920 only 35 percent of the households in the United States had telephones.

During the competitive era, AT&T for the first time took a keen interest in developing the rural market. The incumbent realized that the areas outside the cities had to be secured, otherwise the Independents would use their stronghold to gain entry into AT&T's profitable urban markets. But the passing of competition reduced Bell's incentive to develop the rural market. Consequently, the proportion as well as the number of farms with telephones declined in the 1920s and 1930s.<sup>92</sup>

Finally, as result of the lack of competition and effective regulation, AT&T's long-distance operations earned an average annual rate of return of 10.9 percent between 1913 and 1935. The firm's cost of money during these years was approximately 5 to 6 percent.<sup>93</sup> The sizeable difference between the cost of money, and AT&T's earnings on toll calls suggests that there was a significant, persistent welfare loss to society due to the elimination of competition.

CONCLUSION

Recent research in business history has emphasized that AT&T emerged as the industry leader because of the firm's strategy and structure. Researchers have concluded that AT&T's decision to build and control centrally a higher-quality network than its rivals was the primary factor that determined the incumbent's success. The evidence presented in this article suggests that for the first decade of competition in the Midwest, AT&T marketed an inferior local service, had a smaller toll network for the area in which most toll calls were placed, and maintained its operations poorly. Furthermore, AT&T's operations were unprofitable. Despite these liabilities, by 1910 the firm emerged in control of the region. The vanquishing of the Independents' challenge

<sup>92</sup> Fischer argues that falling farm prices only partly account for the decline. The decrease in telephone subscription coincided with an increase in the percentage of farms with automobiles, indoor water and electricity, and radios. Fischer, "Technology's Retreat," pp. 295–97, 315.

<sup>93</sup> Federal Communications Commission, *Long Lines*, p. 15, and *Investigation*, p. 435.

owed to important strategic moves by AT&T's management, not least of which was predatory pricing.

McGee has pointed out that in the absence of barriers to entry, it would be "foolish" for a firm to engage in predatory price cutting. Without this protection, the predator cannot be certain that even if it regains control of the market, it will be able to recover the losses sustained during the price-cutting period.<sup>94</sup> Although there were no legal barriers to entry for the provision of toll service, AT&T was able to prey on its rivals because of other obstacles in local markets. State and municipal regulations, and to a lesser extent AT&T's ties with the nation's leading financiers, established barriers that allowed the game of rivalry to be played sequentially, rather than simultaneously.<sup>95</sup> If competition had occurred simultaneously in all markets, AT&T would have been unable to adopt a predatory strategy. As it was, by operating at a loss at competitive points, AT&T hindered the Independents' ability to raise capital for the construction of an integrated network. The shortage of money also undermined what was originally the Independents' strongest competitive asset—their quality of service. Lacking the internal cash flow needed for the proper maintenance of their facilities, they had to watch the quality of service on their networks deteriorate.<sup>96</sup> The financial panic of 1907 exacerbated their financial problems. Consequently, AT&T reemerged in control of the industry as increased numbers of Independents either sold their properties to Bell or joined Bell's network on terms that had been considered unsatisfactory a few years earlier.

The historical analysis presented here provides some insight into the contemporary analog of the *Standard Oil* case, the court-approved divestiture of AT&T in *United States vs. AT&T*.<sup>97</sup> In 1974 the Justice Department charged AT&T with conduct that had been "designed to maintain and expand its existing telecommunications service monopoly."<sup>98</sup> Section 2 of the Sherman Anti-Trust Act prohibits attempts to monopolize an industry. Justice Department lawyers argued that during the post-World War II era, AT&T violated this law by preying on rivals. According to the Department of Justice, AT&T was able to impede competition through its control of local exchange facilities: "Local telephone exchanges are 'bottlenecks' under classic antitrust theory. The control of these franchises provides AT&T with the incentive and opportunity to protect, maintain and extend its monopoly in telecom-

<sup>94</sup> McGee, "Predatory Pricing," pp. 142, 168 (quote).

<sup>95</sup> In a review of federal antitrust cases that led to convictions, Koller found a high correlation between predatory attempts and facilitating government practices. Koller, "Myth," p. 113.

<sup>96</sup> AT&TCA, Allen/Fish, Nov. 6, 1902, Dec. 3, 1903, and Jan. 8, 1904, ALB.

<sup>97</sup> *United States v. AT&T*, 552 F. Supp. 131, 226–34 (D.D.C. 1982), *aff'd*, *Maryland v. United States*, 460 U.S. 1001 (1983).

<sup>98</sup> U.S. Department of Justice, Plaintiff's First Statement of Contentions and Proofs, *United States v. AT&T*, 74-1698 (D.D.C.), p. 4.

munications services overall.” In order to eliminate this structural impediment to competition in the long-distance, telecommunications-equipment, and information-service markets, the government proposed that the Bell Operating Companies be prohibited from providing these services.<sup>99</sup>

AT&T replied that it was not guilty of any Section 2 violations, and that divestiture of the Bell System would not be in the nation’s best interest, because AT&T had “provided . . . the world’s best telecommunications service.” AT&T argued that the monopoly structure was the result of “technological and economic imperatives” in the industry. “A review of the history of the telecommunications (from 1876 to [the] present) makes it plain that the structure of the industry . . . evolved directly from the technological imperatives of networking, the interactive and interdependent nature of the telecommunications network, and the need for a single network manager to control, plan and operate the network in order to assure efficiency.”<sup>100</sup> By contrast, the review of AT&T’s conduct from 1894 to 1910 presented in this article suggests that the monopoly structure of the telephone market was not merely the result of “technological and economic imperatives,” but also resulted from such Section 2 violations as predatory pricing, funding of court cases in order to interfere with price increases granted to the Independents by municipalities, acquisition of manufacturers of telephone equipment in order to limit the Independents’ access to the capital markets, and bribes or threats to financiers to discourage financing of the Independents.<sup>101</sup>

Until the market for exchange facilities becomes competitive, the possibility that exchange companies will prey on competitors in order to forestall entry into the telecommunications industry remains very live.<sup>102</sup> By separating the ownership of long-distance and local facilities, the Department of Justice in *United States vs. AT&T* succeeded in eliminating the incentive for local exchange companies to thwart their rivals’ efforts in the long-distance market. Although this structural separation increased the degree of competition in the interexchange market, it did not eliminate the threat that local exchange companies may attempt to leverage their control of the telephone market into new data and video markets. In most areas today, the telephone line provides the only available means of two-way communications. Until economical, alternative avenues of electronic communication become

<sup>99</sup> *Ibid.*, pp. 4 (first quote), 70 (second quote), 527.

<sup>100</sup> Defendants’ First Statement of Contentions and Proof, *United States v. AT&T*, 74-1698 (D.D.C.), pp. 1 (first and second quotes), 4, 80 (third quote).

<sup>101</sup> Abuse of the regulatory process with the intent to harm competitors is evidence of unlawful intent and purpose to monopolize. *Otter Tail Power Co. v. United States* 410 U.S. 366, 379–80 (1973), *on remand*, 360 F Supp. 451, 451–52 (D.Minn. 1973).

<sup>102</sup> *United States v. Western Electric*, 673 F. Supp. 525, 540–62 (D.D.C. 1987).

more widely available, regulatory authorities should continue to exercise due diligence over the practices of local exchange carriers.

#### REFERENCES

- American Telephone and Telegraph Company (AT&T), "Conference Held at Boston, January 23, and 24, 1900: Telephone Service and Charges," AT&TCA.
- American Telephone and Telegraph Company (AT&T), "Defendants' First Statement of Contentions and Proof," *United States v. AT&T*, 74-1698 (D.D.C.).
- American Telephone and Telegraph Corporate Archive (AT&TCA), Warren, NJ.
- Anderson, George, "The Telephone Situation: Its Causes and its Future," Oct. 12, 1906, AT&TCA.
- Areeda, Phillip, and Donald Turner, "Predatory Pricing and Related Practices Under Section 2 of the Sherman Act," *Harvard Law Review*, 88 (Feb. 1975), pp. 697-733.
- Atwater, M. D., "The History of the Central Union Telephone Company," Aug. 26, 1913, AT&TCA.
- Bork, Robert H., *The Antitrust Paradox: A Policy at War with Itself* (New York, 1978).
- Bornholz, Robert, and David S. Evans, "The Early History of Competition in the Telephone Industry," in David S. Evans, ed., *Breaking Up Bell: Essays on Industrial Organization and Regulation* (New York, 1983), pp. 7-40.
- Burns, Malcolm R., "Predatory Pricing and the Acquisition Cost of Competitors," *Journal of Political Economy*, 94 (Apr. 1986), pp. 266-96.
- Carosso, Vincent, *Morgans: Private International Bankers, 1854-1913* (Cambridge, MA, 1987).
- Central Union News* (various dates), New York Public Library.
- Chandler, Alfred D., Jr., *The Visible Hand: Managerial Revolution in American Business* (Cambridge, MA, 1981).
- City Record* [New York] (various dates).
- Commercial and Financial Chronicle* (various dates).
- Connecticut Legislature, *Connecticut Judiciary Hearings: Telephone Matters* (Hartford, 1905).
- Daily Telephone News* (various dates), New York Public Library.
- Danielian, N. R., *AT&T: The Story of Industrial Conquest* (New York, 1939).
- Federal Communications Commission, *Investigation of the Telephone Industry in the United States* (Washington, DC, 1939).
- Federal Communications Commission Accounting Department, *Long Lines Department: Financial and Operating Summary* (Washington, DC, Apr. 15, 1936).
- Federal Communications Commission Accounting Department, *Report on American Telephone and Telegraph Company Corporate and Financial History* (Washington, DC, Jan. 16, 1937), 3 vols.
- Federal Communications Commission Accounting Department, *AT&T Securities Investments* (Washington, DC, Jan. 25, 1937), 5 vols.
- Federal Communications Commission Accounting Department, *Control of Communications: Control of Independent Telephone Properties* (Washington, DC, June 15, 1937), 3 vols.
- Finance* (various dates), New York Public Library.
- Fischer, Claude, "Technology's Retreat: The Decline of Rural Telephony, 1920-1940," *Social Science History*, 11 (Fall 1987), pp. 295-327.

- Garnet, Robert, *The Telephone Enterprise: The Evolution of the Bell System's Horizontal Structure* (Baltimore, 1985).
- Hendrick, Burton J., *The Age of Big Business: A Chronicle of the Capture of Industry* (New Haven, 1919).
- Johnson, F. G., "Experience of a Pioneer Physician in Northern Wisconsin," *Wisconsin Medical Journal*, 38 (July 1939), pp. 576–88.
- Joskow, Paul, and Alvin Klevorick, "A Framework for Analyzing Predatory Pricing Policy," *Yale Law Journal*, 89 (Dec. 1979), pp. 213–70.
- Journal of Commerce and Commercial Bulletin* (various dates).
- Keller, Morton, *The Life Insurance Enterprise, 1885–1910: A Study in the Limits of Corporate Power* (Cambridge, MA, 1963).
- Koller, Roland H., "The Myth of Predatory Pricing—An Empirical Study," *Antitrust Law and Economics Review*, 4 (Summer 1971), pp. 105–23.
- Langdale, John V., "The Growth of Long-Distance Telephony in the Bell System: 1875–1907," *Journal of Historical Geography*, 4 (Apr. 1978), pp. 145–59.
- Latzke, Paul, *A Fight With an Octopus* (Chicago, 1906).
- Lee, John, *The Economics of Telegraphs and Telephones* (London, 1913).
- Lipartito, Kenneth, *The Bell System and Regional Business: The Telephone in the South, 1877–1920* (Baltimore, 1989).
- Lipartito, Kenneth, "System Building at the Margin: The Problem of Public Choice in the Telephone Industry," this JOURNAL, 49 (June 1989), pp. 323–36.
- McGee, John, "Predatory Price Cutting: The Standard Oil (N.J.) Case," *Journal of Law and Economics*, 1 (Oct. 1958), pp. 137–69.
- MacMeal, Harry, *The Story of Independent Telephony* (Chicago, 1934).
- Mathews, G. C., "The Truth About State Regulation of Utilities in Wisconsin," *Annals of the American Academy of Political and Social Science*, 54 (July 1914), pp. 303–20.
- Moody, John, *The Masters of Capital: A Chronicle of Wall Street* (New Haven, 1919).
- Moody's Classified Investments*, (New York, 1905).
- New England Telephone, *The Telephone: A Description of the Bell System with Some Facts Concerning the So-called 'Independent' Movement* (Boston, 1906), Widener Library, Harvard University.
- New York Tribune* (various dates).
- Nichols, Harry P., "Report of the Bureau of Franchises Upon the Application of the Atlantic Telephone Company," Oct. 12, 1905, AT&TCA.
- Nichols, Harry P., "Result of Investigation of the Operation of a Dual System of Telephones in Various Cities," Nov. 21, 1906, AT&TCA.
- Ordovery, Janusz A., and Garth Saloner, "Predation, Monopolization, and Antitrust," in Richard Schmallensee and Robert Willig, eds., *Handbook of Industrial Organization* (Amsterdam, 1989), pp. 537–96.
- Read et al. v. Central Union Telephone Company*, Superior Court of Cook County Illinois, Chancery General Number 299,689. All documents cited are available in AT&TCA.
- Redlich, Fritz, *The Molding of American Banking: Men and Ideas* (New York, 1951), vol. 2.
- "Report of the Fourth Annual Convention of the Independent Telephone Association" (1900), 12, box 11274, Museum of Independent Telephony, Abilene, KS.
- Salop, Steven, and David Schiffman, "Raising Rivals' Costs," *American Economic Review*, 73 (May 1983), pp. 267–71.
- Sears, Vinton, A., *Telephone Development: Status of the Industry, Scope and Effect of Competition* (Boston, 1905).
- Stehman, Warren J., *The Financial History of the American Telephone and Telegraph Company* (Boston, 1925).

- Telephone Securities Weekly* (various dates), New York Public Library.
- Telephony* (various dates).
- Tirole, Jean, *The Theory of Industrial Organization* (Cambridge, MA, 1989).
- U.S. Department of Commerce, Bureau of the Census, *Telephone and Telegraphs: 1907* (Washington, DC, 1910).
- U.S. Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970* (Washington, DC, 1975), vol. 2.
- U.S. Department of Justice, Plaintiff's First Statement of Contentions and Proofs, *United States v. AT&T*, 74-1698 (D.D.C.).
- United Telephone Voice* (various dates), Museum of Independent Telephony, Abilene, KS.
- Vanderlip, Frank. Collection. Columbia University, New York.
- Wasserman, Neil, *From Invention to Innovation: Long-Distance Telephone Transmission at the Turn of the Century* (Baltimore, 1985).
- Weik, Jesse, "The Telephone Movement: Another Point of View," *Atlantic Monthly*, 97 (Feb. 1906), pp. 263-69.
- Weiman, David, and Richard Levin, "Preying for Monopoly: The Case of Southern Bell, 1894-1912," *Journal of Political Economy*, 102 (Feb. 1994), pp. 103-126.
- Western Electrician* (various dates).
- Whitney, L. N., "Report on Conditions in Indiana," Aug. 1907, box 11275, Museum of Independent Telephony, Abilene, KS.
- Wisconsin State Historical Society (WSHS), Madison, WI.
- Wisconsin Telephone News* (various dates), Wisconsin Bell Telephone, Milwaukee, WI.
- Yamey, Basil S., "Predatory Price Cutting: Notes and Comments," *Journal of Law and Economics*, 15 (Apr. 1972), pp. 129-42.