Where Was the White Knight when the Competition Wanted One? An Analysis of the First Major Attempt to Build an Alternative Toll Network

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Where Was the White Knight When the Competition Needed One?

Introduction

For a nineteen year period following the expiration of Alexander Graham Bell's telephone patents, much of the nation had a choice of obtaining telephone service from one of two non-interconnecting networks. Historians have attributed AT&T's re-emergence as the dominant firm in the industry to its integrated business structure and its foresight and success in establishing a long-distance network. The research to date has largely ignored the question of what type of strategy and structure was being followed by Bell's rivals, the Independents. Where the issue has been addressed, it has been incorrectly asserted that Bell's rivals developed a network that was not suitable for long-distance services.[1] In this paper I will argue that the Independents' objectives and priorities were essentially no different from Bell's, but that the entrants lost the competitive contest because of municipal and state regulations, as well as capital market imperfections.

The Setting

In 1876, Alexander Graham Bell invented the telephone. His invention, which was later patented, was the legal and scientific foundation of what subsequently became known as the American Telephone and Telegraph Company (AT&T), or the Bell System. This patent, along with his invention of the magnet telephone, provided the Bell System with a

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[1]A network is built by connecting various nodes. A distinguishing characteristic of a network industry is that unlike other industries, production occurs at various geographical locations. While some industries exhibit various degrees of vertical integration, the most distinguishing aspect of a network industry is the need to integrate horizontally, i.e. to establish interconnection procedures between nodes.

monopoly through 1894.[2]

AT&T's success in the post-patent period has been attributed to its strategy and its structure. Within three years of Bell's original invention, the firm's general manager, Theodore Vail, recognized the potential of long distance telephone service.[3] From that early date, the Bell System was organized in a manner which helped it to achieve its objective of building a nationwide network.

Vail's vision of a unified network was put to the test during the years 1894 through 1913. Throughout most of the nation, but especially the mid-west, the Independents competed head-to-head with Bell. In many localities, Bell's market share, as defined by the number of customers served, fell below fifty percent. The competing networks did not interconnect, and due to the public good nature of the industry, it was conceivable that the Independents could end up as the nation's sole supplier of telephone service.[4]

Contemporaries, as well as historians, have attributed Bell's victory to Vail's vision of the importance of long-distance service. The Independents were able to build local telephone systems, but they failed to build an equally extensive toll network.[5] Consequently, many of the nodes on the Independent network remained regionally isolated. Subscribers to the Independent system found it difficult to reach distances greater than

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[2]Federal Communications Commission, Investigation of the Telephone Industry in the United States (Washington: U.S. Government Printing Office, 1939, reprint Arno Press 1974), p. 1-10.

[3]Neil Wasserman, From Invention to Innovation: Long-Distance Telephone Transmission at the Turn of the Century (Baltimore: John Hopkins University Press, 1985), p. 17.

[4]Western Electrician, April 2, 1898, p. 201.

[5]Alfred D. Chandler Jr., The Visible Hand: Managerial Revolution in American Business (Cambridge, Harvard University Press, 1981), 202; Federal Communications Commission, p.130; and John V. Langdale, "The Growth of Long-Distance Telephony in the Bell System: 1875-1907," 4 Journal of Historical Geography 145-59, (1978); "Brief and Argument for Appellant, American Telephone and Telegraph," in Read et. al. v. Central Union (hereafter "Read,") Appellate Court of Illinois, 1st District, Gen. No. 23664, March 1918, American Telephone and Telegraph Company Archive (hereafter AT&TCA).

approximately 100 miles, and impossible to reach Chicago, Milwaukee, New York, or Boston.[6]

There are two reasons why it was easier to reach certain places on Bell's system. First, the Independents had only a limited success in establishing a presence in any of the four aforementioned cities. The reasons for this failure will be discussed below. The second reason was a function of AT&T's structure. As a vertically and horizontally integrated firm, the central management of Bell was in a superior position to implement policies which aided the development of a long distance network. Through its engineering department and its manufacturing subsidiary, Western Electric, AT&T was able to ensure that the Bell operating companies (BOCs) around the nation used compatible equipment and operating standards.[7] Compatible equipment was necessary in order to minimize such transmission problems as distortion, line loss, line noise, and phase balance. Operating standards were needed to ensure that operators could smoothly hand traffic from one node to the next. Furthermore, standard operating procedures aided the central management's review of the operating companies and the division of toll revenues between the operating companies and the parent company.

The Independents did recognize the need to establish an integrated system. In 1896, two years after the expiration of the patents, the Independents were attempting to construct a toll network and gain entry into Bell's monopoly markets. They felt that a toll network was "absolutely essential to the life of the various exchanges." The entrants believed that structurally the network should be organized under the management

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[6]See, for example, Telephone Securities Weekly, December 8, 1907, p.14; Topeka State Journal, January 2, 1904, in the Daily Telephone News, January 10, 1904; and Harry Nichols, "Result of Investigation of the Operation of a Dual System of Telephones in Various Cities," p. 17, November 21, 1906, AT&TCA (hereafter Nichols, "Result,").

[7]George Smith, The Anatomy of a Business Strategy: Bell, Western Electric, and the Origins of the American Telephone Industry (Baltimore: John Hopkins University Press, 1985); and Wasserman.

of a consolidated firm. At first the leaders of the Independents sought an "outsider," such as Western Union or Postal Telegraph, to organize the consolidation. When no white knight stepped forward, the Independents tried to achieve integration and central control through a joint stock company controlled by the exchanges.[8] But these efforts were also unsuccessful.[9]

It is paradoxical that consolidation of the Independents network was not achieved because this was an era in which large-scale mergers were organized in many other industries. Unlike the telephone industry, many of these mergers were not based on cost economies. They were organized for monopolization and could not be sustained because the industries were contestable. Integration in the telephone industry made economic sense because of the public good character of the service and the need to coordinate traffic between nodes. Furthermore, recent econometric work suggests that at the start of the twentieth century, an industry, which had high fixed costs and had recently experienced rapid growth, was a likely candidate for consolidation.[10] Both conditions applied to the telephone industry.

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[8] W.A. Jackson to C.Jay French (quotes), January 16, 1897, A.G. Fuller to John E. Hudson, April 21, 1897, and W.A. Jackson to M.J. Carney, December 9, 1896, box 1277, AT&TCA; "Report of the Fourth Annual Convention of Independent Telephone Association," June 12-14, 1900, p.11-12, Museum of Independent Telephone (MIT), box 11274; A.L. Hutchenson to Independent Telephone Companies of Wisconsin, February 22, 1900, Dane County Telephone Papers (hereafter DCTP) at Wisconsin State Historical Society (hereafter WSHS); 11 Electrical Engineering 127 (1898); 13 Electrical Engineering and Telephone Magazine 199 (1899); 2 Telephony 20 (July 1901), 10 (December 1905), p.461, 12 (July 1906), p.20; and Wisconsin State Journal, March 7 and 8, 1907.

[9] Various organizational structures were attempted to unite the Independents: complete integration, including manufacturing of telephone equipment, under the control of one firm (this was the organization structure of AT&T); unification through a firm that owned the exchanges and the connecting toll lines, but no manufacturing facilities; and a toll carrier that would connect together the locally owned exchanges. 37 Western Electrician 305 (October 14, 1905); 69 Commercial and Financial Chronicle 1224 (December 16, 1899); Milwaukee Sentinel, February 12 and 13, 1903; and Harry MacMeal, The Story of Independent Telephony (Chicago: John F. Cuneo Company, 1934), p.85.

[10] Naomi Lamoreaux, The Great Merger Movement in American Business, 1895-1904 (New York: Cambridge University Press, 1985), p.95-96, 190.

Market Share

The Independents rapidly achieved a large share of the market. The following factors contributed to this development: in 1894, Bell no longer held patent control over the technology, entry into medium and small sized cities did not require the sinking of a large amount of capital, AT&T's supranormal earnings attracted competitors, and consumers were anxious to support a competitive telephone system. The demand for a second system was an outgrowth of consumer dissatisfaction with Bell's high rates, its rate structure, its quality-of-service, and its failure to develop the residential and rural markets. Also an anti-monopoly sentiment was prevalent throughout the nation at that time.[11]

Chart one shows that by 1907 Bell's market share was 49%, its sub-licensees controlled an additional 14%, and its rivals controlled the remaining 37%.[12]

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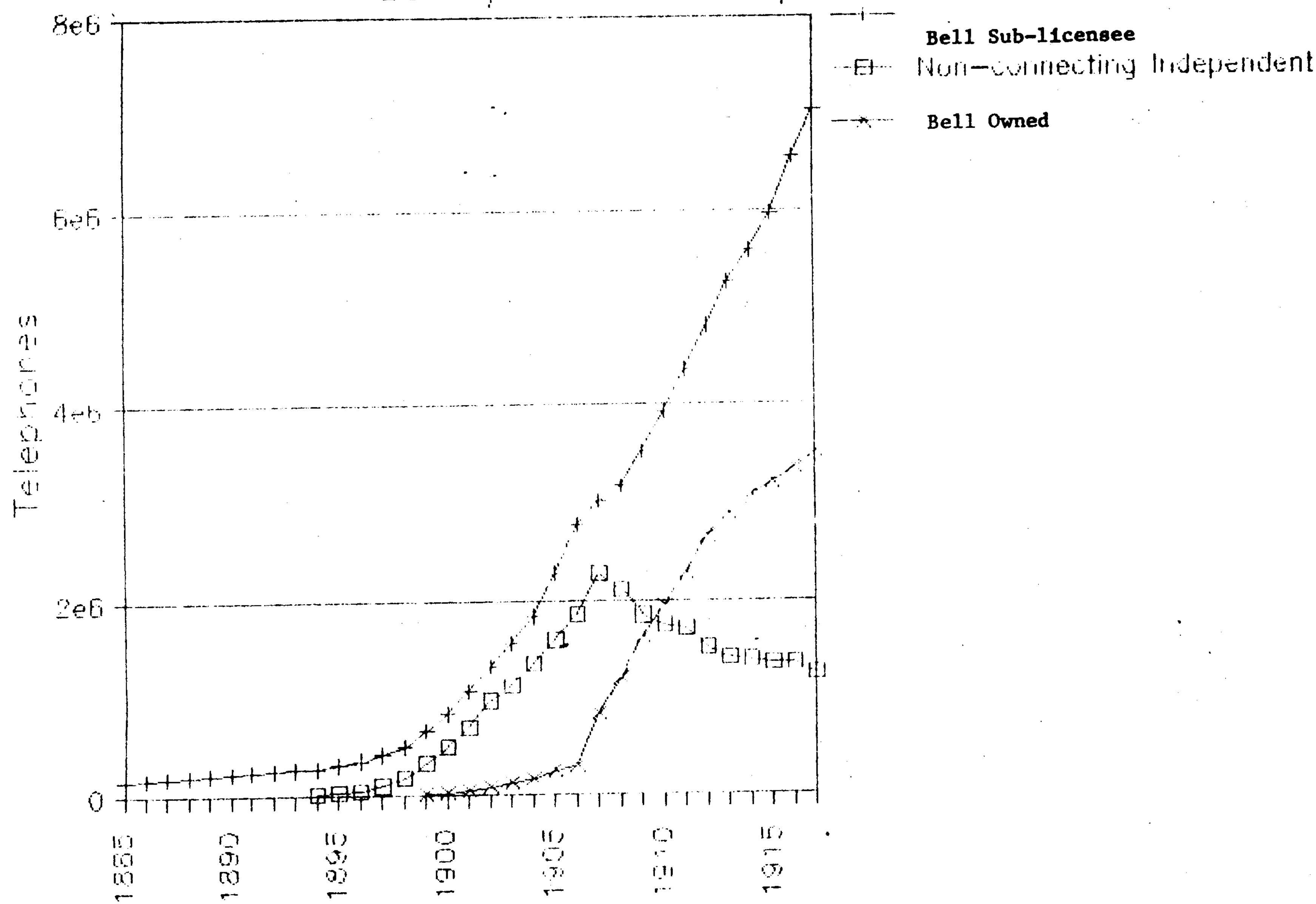
[11]Robert Bornholz and David Evans, "The Early History of Competition in the Telephone Industry," in Evans, ed., Breaking Up Bell: Essays on Industrial Organization and Regulation (New York: North Holland, 1983), p.25; B.B. Clarke to Robert La Follette, August 30, 1895, DCTP; Testimony of Louis G. Richardson, in "Read," p.9149-50; Frederick Dickson, Telephone Investments and Others (Cleveland: A.C. Rogers Co., 1905), p.25; Claude S. Fisher, "'Touch Someone:' The Telephone Industry Discovers Sociability," 29 Technology and Culture 32 (1988); Wisconsin State Journal, December 31, 1895; Frank M. Hoyt, et. al., "Invitation to businessmen to discuss the telephone situation in Milwaukee," October 25, 1895, box 1295, AT&TCA; MacMeal, p. 110-11; M.D. Atwater, "The History of the Central Union Telephone Company," p. 27, 273 (1913) AT&TCA; George Anderson, "The Telephone Situation: Its Causes and its Future," October 12, 1906, p. 24, 57, AT&TCA; and Steven C. Piott, The Anti-Monopoly Persuasion: Popular Resistance to the Rise of the Big Business in the Midwest (Westport, Connecticut: Greenwood Press, 1985).

[12]Federal Communications Commission, p. 129.

Telephones in the United States

Bell System and Independents



National market share data underscores the Independents success and failures in certain areas of the country. In the mid-west, they were especially successful. In Indiana, Ohio, and Iowa, Bell and its sub-licensees controlled less than 45% of the market. On the other hand, the Independents fared poorly in the Northeast and the West, controlling less than 25% of the market. In the South, the Independents controlled approximately one-third of the market.[13]

Market share information is a good indicator of market strength in the telephone industry because of the externalities associated with consumption. The value of telephone service increased with the number of customers who could be reached on a network. During that era, the competing networks did not interconnect. Consequently, the number of people one could reach was determined by the number of people on the system from which one obtained service. The only way to obtain universal service was to subscribe to both systems. At competitive points, approximately fifteen percent of the customers had two phones, one from each of the competing companies.[14]

A consumer's decision regarding to which system or systems one should subscribe was in part a function of the number of local and toll connections. A call to a subscriber in a second town was known as a toll or long-distance call. The value of joining a telephone network increased with the number of toll subscribers that a customer could reach. In the mid-west, the Independents served a larger customer base. On the other hand, the Bell network provided connections to certain major metropolitan areas in which the Independents were unable to establish a presence: Milwaukee, Chicago, New York,

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[13]Bureau of the Census, Telephones: 1907 (Washington: Government Printing Office, 1910), p. 22-3. State level aggregate data is also misleading. In central and upstate New York, the Independents had approximately 45% of the market. But for the state as a whole, they only served about 13% of the telephone stations. Ibid; and Pickernell to Hall, May 21, 1909, box 1376, AT&TCA.

[14]Nichols, "Result," p.24.

Boston and Cincinnati. Therefore, the Bell System offered better connections to the major business centers.

As will be shown in the next section, most long distance calls were placed to nearby towns. The likelihood of desiring to place a long-distance call may have been higher on the Independent's system, because they served more of the local market, but fewer calls were placed because of their failure to establish an extensive, well-organized toll network. Some have suggested that this failure was a primary reason for Bell's eventual success. In the remainder of the paper, I will discuss why the Independents were unable to establish a comparable network.

Building a Toll Network

Construction of a toll network involves five steps: (1) identify a demand for the product and establish the construction of a toll system as an organizational objective; (2) the availability of the technology required for toll calls; (3) establish an organizational framework that is conducive to network integration; (4) obtain the capital needed for the system; and (5) establish a presence in locations which customers desire to reach.[15]

The Independents recognized early on that their long-run success was dependent on the construction of a toll network. In 1897, three years after they were able to enter the industry, the Independents formed a national organization, the Independent Telephone Association of the United States, that included in its objectives the establishment of a long-distance network and the provision of service in those cities served exclusively by

[15]There were no major legal obstacles obtaining right-of-way for the inter-city lines because they received the same statutory treatment as telegraph lines.

Bell.[16]

Owners of the Independent telephone companies in mid-size and larger cities were the principal founding membership of the association. They knew that there was considerable popular support for their local telephone exchanges, but that their long-term success was dependent on their ability to provide a network comparable to Bell's. Many business customers retained service with Bell only because of its superior long-distance connections. Customers preferred the Independents for local calling because of the new suppliers' lower rates, better quality service,[17] and because of the strong anti-monopoly sentiment against the "foreign" (Boston) firm, AT&T. Complete control of the

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[16]Warren J. Stehman, The Financial History of the American Telephone and Telegraph Company (Boston: Houghton Mifflin Co., 1925, reprinted by Augustus M. Kelley Publishers 1967), p.56.

[17]Garnet and Lipartito argue that the Independents constructed a low quality system that was geared to serving local needs, while AT&T established high quality standards that were based on the technological requirements of long-distance telephone service. Robert Garnet, The Telephone Enterprise: The Evolution of the Bell System's Horizontal Structure, 1876-1909 (Baltimore: John Hopkins University Press, 1985), p. 124, 126; and Kenneth Lipartito, "The Telephone in the South: A Comparative Analysis, 1877-1920," Ph.d. dissertation, John Hopkins University, 1986, p. 182, 187, 191, 209-10, 424.

The evidence does not support their claim. In the Central Union territory, Bell's service was worse than the Independents from the start of competition, and did not start to improve significantly until 1903. Testimony of Horace F. Hill, in "Read," p.3577-78; Minutes of Director's Meetings, Central Union Telephone Company, March 18, 1908, p. 265, AT&TCA; C. Fleutler to F. Fish, March 25, 1902, box 1326, AT&TCA; and T.B. Doolittle to J. E. Hudson, November 1, 1898, box 1285, AT&TCA. The Independents started with a metallic network--the state-of-the-art technology for long-distance calls. C.B. Salmon to William J. Latta, April 4, 1900, DCTP; Hill, p.3575-7; and C. Fleutler to F. Fish, March 25, 1902, box 1326, AT&TCA.

Central Union's response to competition, through 1903, was too redesign its network for a lower quality-service, 10 party telephone service. This was done with the full support of the parent company. Atwater, p.53, 56, 68, 87, 274.

The Independents sold one-party telephone service. By 1903 it became apparent that Central Union could not regain control of the market by offering a lower quality service. In that year, the firm, under its new president L. Richardson, made a commitment to upgrade its network. This could not be achieved overnight and it was not until 1905 before these improvements were widely recognized. Minutes of Director's Meeting, Central Union Telephone Company, p. 266, AT&TCA. [DATE]

In 1906, Harry Nichols, the assistant engineer of New York City's Bureau of Franchise, visited, along with his staff, 36 cities where dual systems were operating. He concluded that the Bell and Independent exchanges provided equal quality local service. "Result," p. 17.

market would be achieved when the entrants could offer the same access to distance points as that which was available on Bell's network.

It was a small percentage of customers who desired to reach these distance points. Approximately ninety percent of the toll calls out of mid-sized and smaller cities were to places within a fifty mile radius of an exchange.[18] Central Union, the BOC in Indiana, Illinois and Ohio studied customer calling habits around 1905. They found that "only about twenty per cent of the exchange subscribers ever patronized a toll line at all, and only...three and a half per cent...ever patronized a toll line over a hundred miles." Even between major metropolises such as New York and Chicago, or Cleveland and New York, the volume of traffic was low. During 1903 fifty calls was the largest daily volume of calls to Chicago, and on average, in 1905, only fifteen calls a day went between New York and Cleveland. Reviewing the evidence, a contemporary consultant of AT&T concluded that the long-distance toll business was "but a trifling fraction of the entire traffic and affects but few subscribers."[19]

As shown on the following table, toll calls were more likely to be placed by business customers. This customer group was crucial to the life of the Independents, because, as will be discussed below, they often relied on local businesses for financing. In order to obtain capital from this group, the Independents needed to provide them with a network that was as ubiquitous as AT&T's.[20]

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[18]Telephone Securities Weekly, December 7, 1907, p.14; J.C. Harper to C.W. Twining, May 29,1899; Dickson, p. 40; Nichols, "Result," p.11; and Harper to Robert Davis, May 15, 1900.

[19]Hill, p.3037-8 (first quote), 3537; Anderson, p. 83-4 (second quote); and Dickson, p.41.

AT&T believed that the volume of long-distance toll calls was low, in part, due to its high price. A five-minute call between Chicago and New York cost $9. For the next best alternative, the telegraph, the cost of a message was $.50. Hill, p.3013.

[20]These business customers, which made up a small part of the total population, were cosmopolitans, while the residential community had more of a parochial view of the world. Robert K. Merton, Social Theory and Social Structure (New York: Free Press,

Table One

Outgoing Calls Completed--24-Hour Usage: Milwaukee 1909[21]

	Business	Residence	Miscallenous	Total
Total Calls	97,317	75,236	5,799	178,352
Toll Calls	1,848	571	223	2,642
Toll as Percent of Total	1.9%	0.76	3.85	1.48
Customer Lines	8,256	11,111	362	19,729

Technology was not a limiting factor for the Independents. During the period 1894 to 1907, they had access to the same technology used on long-distance lines as AT&T. Also, the equipment used at the local level, the line connecting to customers, switchboards and telephones were of equal quality to AT&T's.[22]

Organizational Structure

1968), p.447. Both interests were important for the success of the Independents: the residential community because of the public-good nature of the industry, and the businesses because of their financial resources.

[21]B.E. Miller, "Milwaukee Telephone Study," April 1909, box 9, series 1344, WSHS. Nationally toll calls constituted 2.26% of the telephone traffic in 1909. Historical Statistics, p.783.

[22]Smith argues that one of the strengths of the Bell System was its vertical integration. Through central control of both the manufacturer and the operating companies, AT&T could insure that equipment was available that met the technical needs of its network. The Independents, on the other hand, were supplied by over 50 manufacturing companies. Even though its trade association did establish standards, this did not insure uniformity of standards. While there was greater variance in the type of equipment manufactured for the Independents, the overall quality of Independents' equipment was equal to that of AT&T's. High quality equipment was a byproduct of competition between so many suppliers. L.N. Whitney, "Report on Conditions in Indiana," box 11, MIT, p.5-6. It is not obvious whether innovation occurs faster in an oligopolistic or monopolistic market structure. Jenifer Reinganum, "Dynamic Games of Innovation," 25 Journal of Economic Theory 21-41.

Some Bell System analysts advocated that AT&T divest itself of Western Electric in order to improve its public standing. The public did not accept the argument that it was necessary for the BOCs to buy all of its equipment from a subsidiary of AT&T. Anderson, p.71; Whitney, p.47.

Theodore Vail, AT&T's visionary leader, recognized that while control of technology was important, a well formulated business policy was more crucial for controlling the industry. The strategy and structure of his firm was clearly defined--control of the industry could be established by a corporate structure that was conducive to the free-flow of traffic between exchanges.[23]

The Independents, unlike AT&T, were not centrally managed or owned. In terms of marketing, this provided them with a great advantage. The political climate of the time was such that a large part of the population preferred supporting a locally owned firm, rather than a company that was controlled by financiers in Boston and New York. On the other hand, the absence of central control made it more difficult for the entrants to integrate their systems. Through their trade association, they were able to establish operating standards, but unlike AT&T, they could not force the exchange operators to give priority to toll calls. Also, as toll lines were constructed, problems such as equipment compatibility and division of toll revenues between the local exchanges and the toll line carrier had to be resolved. While the Independents were largely able to resolve these problems, the negotiations were more cumbersome than in a centrally controlled firm in which the general department of the firm could issue binding directives.[24]

Nevertheless, the absence of central control was crucial to the demise of the Independents because of the prisoner's dilemma they faced. Bell's strategy during this

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[23]"Deposition of Theodore N. Vail," in "Read," p. 15, 29.

[24]Finance, July 7, 1906, p.859; and American Telephone Journal, July 1, 1905, p.452-462.

The railroads attempted to resolve similar coordination problems through their trade associations. The railroad agreements were susceptible to breakdown because some firm might cheat on the cartel price. Chandler, p. 124-43. The Independents' trade association was more stable because their service territories were exclusive, and therefore there was no incentive to provide customers with discounts.

competitive era was to purchase competing toll lines and exchange companies that were located at central locations.[25]

The owners of the Independent properties had to decide whether to act in the interest of the coalition or to sell their property to Bell. Often Bell was willing to pay a higher price for the securities than could be obtained elsewhere. As will be discussed more fully below, there was not a large market for Independent securities. Consequently, AT&T was one of the few potential buyers of Independent securities or bonds, and the price offered by Bell reflected the strategic value of breaking up the coalition.[26] Those who remained loyal to the Independent network did not have the resources to purchase the Independent securities at a similar price.

The prisoner dilemma is illustrated by AT&T's purchase of the United States Independent Telephone (USIT) of Rochester, New York. In 1907, a time in which USIT was having trouble paying the interest due on its bonds, the firm decided to sell its properties to AT&T. USIT was a holding company which controlled Stromberg-Carlson, a major manufacturer of telephone equipment, a toll system in central and northern New York, and the Independent exchanges in Northern New York.[27]

Like AT&T's purchase of Kellogg, a second major manufacturer of telephone equipment for Independent companies, this purchase was of special strategic value because equipment manufacturers often served as a major source of financing for construction. The exchange company would pay the manufacturer and construction company, in part, with

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[25]F.A. Pickernell to Fish, October 20, 1905, in "Read," and Burt to Vail, October 31, 1908, box 1163, AT&TCA.

[26]F. Pickernell and L. Richardson to F. Fish, October 13, 1905 in "Read;" and Burt to Fish, February 24, 1906, box 1136, AT&TCA. A lack of secondary markets, other than competitors, was a common problem faced by industrial firms in the late 1880's. Thomas R. Navin, and Marian V. Sears, "The Rise of a Market for Industrial Securities, 1887-1902," 29 Business History Review 105, 107-8 (1955).

[27]Telephone Securities Weekly, April 13, 1907.

stock certificates.[28] By purchasing the manufacturing companies, AT&T was able to deny the local companies this important source of finance capital.

Unlike Kellogg, the purchase of USIT included the acquisition of toll and exchange properties. The Independents were strong in central and northern New York where they controled nearly fifty percent of the market.[29] While the acquisition of the properties was in the best interest of the owners of USIT, it significantly reduced the value of the properties of nearby exchanges. Federal Telephone, a holding company that operated in nearby Buffalo and elsewhere, saw its stock fall from $33 to $13 per share, a drop of 60%, in reaction to the acquisition. When the state attorney-general obtained a court injunction on the grounds that the purchase violated the anti-trust statutes, Federal's stock increased back to $21.[30]

The price fluctuations of the Federal Telephone Company is a clear indication of why many of the owners of the Independent properties sought a white knight. As a network industry, the value of their properties was a function of the number of connections available. When USIT owners sold their properties to AT&T, they did what was in their best interest and discounted or ignored the impact on the rest of the Independent coalition.

Consolidation would have provided the Independents a mechanism to prevent defections. Lacking the financial resources for a merger, they attempted to obtain cooperation through contractual arrangements. Independent companies signed contracts which established exclusive connections for an extended period of time, often 99-years. The contract prohibited either party from breaking connections, even in cases in which one

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[28]Dunbar v. American Telephone and Telegraph Co. et. al., 238 Illinois 456, 480 (1909); and Whitney, p.5.

[29]Pickernell to Hall, May 21, 1909, box 1376, AT&TCA.

[30]Telephone Securities Weekly, April 7, 1907, p.11, June 8 and 15, 1907, p. 8 and 14.

party joined the Bell network. These contracts were less effective than consolidation due to the cost of enforcement and because some courts found the arrangement to be an illegal restraint of trade. Internally, AT&T established similar exclusive interconnection requirements on its operating companies. After Bell moved its headquarters from Boston to New York, in part because it could then obtain majority control of its operating companies, the enforcement issue never arose for the firm.[31]

The reaction on the stock markets to the acquisition of USIT was limited to the immediate geographic area. The stock prices of the Independent exchange and toll companies in Ohio and Albany, were unaffected by the acquisition.[32] One possible explanation for the absence of reaction is that the local stock markets did not think that it was likely that the Independents would succeed in establishing a nationwide network. Therefore, the sale of the Rochester properties was consistent with apriori beliefs. This does not seem likely given the rapid growth of the Independent movement and the recent, or pending, acquisition of franchises in the few cities in which they had not established a presence. Furthermore, Albany appears to have been part, or was certainly intending to become part of the New York State toll network linked together by USIT. Bell's acquisition of the USIT toll network should have had a major impact on the value of the Albany Independent. If a long-distance toll network was vitally important to the success of the local company. The absence of a significant market reaction suggests instead that long-distance toll connections were not vital to the success of an Independent exchange company. Instead, it was only necessary for the firm to offer toll

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[31] 70 Commercial and Financial Chronicle 585 (March 24, 1900) and 818 (April 28, 1900); Union Trust v. Kinloch Long Distance Telephone, 258 Illinois 202 (1913); and U.S. Telephone v. Central Union Telephone, et. al. 202 Fed 66 (1913). Some courts concluded that the exclusive toll contracts did not violate state anti-trust laws. U.S. Telephone v. Middlepoint Home Telephone 86 Ohio 319 (1912); Home Telephone v. Sarcoxie Light and Telephone 236 Missouri 114; and Cumberland Telephone and Telegraph v. State 100 Miss. 102.

[32] Commercial and Financial Chronicle: Bank and Quotation Section and Finance.

connections to nearby towns. This would explain why there was a big impact on the price of the Buffalo Independent, but little impact on the Albany firm.[33]

Sub-Licensee Contracts

In addition to purchasing the property of some of its competitors, a second method of undermining the Independent's network was to sign sub-licensee contracts with firms with which it did not compete. During the patent period, Bell had not developed the less densely populated markets. When the patents expired, farmers established rural telephone companies and attempted to obtain connections into the local business centers. Not until 1901 did Bell show much willingness to interconnect with those rural telephone companies.[34]

The decision to connect with the Independent companies reflects Bell's belated recognition that the value of its own network increased with the number of connections with rural America. At first, the competitive Independent exchanges had a near monopoly on connections to the surrounding rural communities. Since most toll traffic was within a short radius of an exchange, it was not sensible for Bell to ignore this market. Interconnection provided an inexpensive way of establishing a presence in the rural

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[33]If long-distance toll connections were of minor importance to the independents, AT&T's acquisition of the Pupin coil would have had little impact on the eventual demise of the Independents. Open-wire networks could transmit signals for several hundred miles. The pupin coil extended the distances which could be reached on the AT&T network and lowered the cost of toll service. Wasserman, p.121-2.

[34]Garnet, p.125; McLeod to French, March 25, 1902, box 1277, AT&TCA; Fish to A. Burt, November 14, 1901, PLB v.17; Atwater, p. 76; and Wisconsin Telephone News 1 (December 1906).

markets.[35]

By becoming a sub-licensee, the Independent Company would be able to connect its customers with Bell's extensive toll network. However, the trade-off for the sub-licensee was that it had to agree that it would not connect with any Independent Telephone Company that was not a sub-licensee, and it must agree to limit its service area to those territories that Bell was not interested in serving.[36]

The contracts were strategically important because they broke up the Independents' toll network and impeded the Independents' ability to gain entry into major cities, such as Milwaukee and Chicago. One of the major selling points of establishing an Independent system in the "cream city" and the "windy city" was that it would provide toll connections to communities which Bell did not serve. Bell knew that competition would be welcome in Chicago and Milwaukee unless it extended its network into the surrounding rural areas. The sub-licensing contracts reduced the demand for competition in these two cities.[37]

Bell's success in obtaining sub-licensee agreements with telephone companies in rural areas and small cities grew over time (chart one), in part, as a result of the inadequate Independent toll system. For years, the Independents had discussed plans to form a regional, state, and national network, but in many areas they had met with little

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[35]Garnet, p. 125; and Testimony of A. Burt, tr. 175, Winter v. Wisconsin Telephone Company and La Crosse Telephone Company, case U-317, Wisconsin Railroad Commission, WSHS.

[36]Western Electrician 30 (February 8, 1902), p. 100; and Fish to McLeod, November 8, 1904, v.36, PLB.

The areas that Bell was willing to let the sub-licensees serve was determined by simple profit maximization--the more lean territories were left for the Independents. Garnet, p. 125-26; and Vail to the Presidents of the BOCs, February, 10, 1908, v. 50, PLB, AT&TCA..

[37]Electrical World, February 4, 1905; and Atwater, p. 72-3, 76.

success. This led some frustrated Independent firms to break away from the coalition.[38]

In 1907, the inadequate Independent toll system appears to have played a role in the decision of the Wood County Telephone Company, one of the principal firms in the Wisconsin Independent movement, to break with the Associations's policy of not signing a sub-licensee contracts with Wisconsin Telephone.[39] A few years earlier, one of the directors of Wood County, Judge J. A. Gaynor, had been one of the state's most vocal opponents to the sub-licensee contracts. In 1902, Gaynor's company was offered free use of Bell telephones for ten years, toll interconnection, and the end of exchange competition, if it would give Bell the telephones it had purchased from Independent suppliers, and agree not to connect with firms with which Bell competed. Gaynor appeared before the Wisconsin Independent Telephone Association and told the members that the sub-licensee contract was not in the Independent companies' or its customers' financial interests. Gaynor was concerned that the sub-licensee arrangement would fragment the Independent movement. If Independents signed the sub-licensee agreement, once the original contracts expired the sub-licensee might have no bargaining power with

[38]Others signed the contracts because Bell had better access to the capital markets. The Brown Telephone Company ended its rivalry with Bell in exchange for the New York firm's commitment to help it raise capital. Even though Brown dominated the market in central Kansas, it felt that it needed to become a sub-licensee in order that it could obtain capital for expansion. It could not raise the money on its own behalf. Mary Loy Brown, "The Corporate History of United Telecommunications, Inc." draft manuscript, November 1987, p. 24-5, MIT; and Atwater, p. 144.

[39]Minutes of the Board of Directors Wood County Telephone Company, February 12, 1907, Wisconsin Rapids, Wisconsin.

At the 1905 convention, Bell sub-licensees were expelled from the Association. In so doing, the general membership rejected the pleas that the contractual arrangement was necessary because of the inadequacy of the Independents' toll network and that the sub-licensees were tired of waiting for the lines that promoters had been promising for many years. Milwaukee Sentinel, May 22, 1905. The same argument was used by other sub-licensees to explain why they entered into the contracts with Bell. Telephony 3 (1902), p.66, 69; Western Electrician 30 (March 1, 1902), p. 148. The national association of Independents also excluded sub-licensees from participating in their organization. Western Electrician 33 (December 12, 1903), p. 444.

Bell because there might no longer be an alternative system. Gaynor did not want to return the control of the phone system to Bell. Therefore, the contract was rejected.[40]

In his speech in 1902, Gaynor did concede that it was sensible to have only one supplier of telephone service. He believed that the industry was a natural monopoly that could best be run by a single firm. Gaynor offered a caveat, however:

> until our laws are modified so as to permit public ownership or public control of the utilities, competition is the source of protection left to the people.[41]

Wood County's decision to become a sub-licensee may be attributable to two factors. First, during the 1906 gubernatorial campaign both the Republicans and Democrats adopted platforms which called for regulation of public utilities.[42] While the political parties' interest in regulating public utilities seemed to be directed mostly toward gas and electric companies, Gaynor and the Company's other directors might have concluded that public control would be extended to the telephone industry, and, therefore, it would no longer be necessary to rely on competition to protect the public. But, when Wood County made the decision to become a sub-licensee, the extent or form of public control was not known. Therefore, this in itself is not a satisfactory explanation.[43]

The second possible explanation is that as the nation's economy evolved and people became more familiar with the service, customers had an increased need to be connected to the larger cities served exclusively by Bell. In 1903, Gaynor and the other board

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[40]Western Electrician 30 (February 8, 1902), pp. 32 and 106, and 30 (March 1, 1902), p. 148; and Judge J.A. Gaynor, "Proposed Contract of the Wisconsin Telephone Company," American Telephone Journal (n.d., n.p.), AT&TCA.

[41]Ibid.

[42]Blue Book on the State of Wisconsin (Madison: Democrat Printing Company, 1907), pp. 1071, 1079.

[43]The decision was made by the directors in January 1907. Legislative hearings on the public utility act began in March 1907 and was not passed until May 1907. The law, which did provide for regulation of telephone companies, was opposed by the politically influential Independents.

members concluded that there was no demand for interconnection; customers were satisfied with the service available to nearby towns. Because its customers were satisfied with the limited service, and they distrusted Bell, the Company rejected the "liberal terms" offered by Wisconsin Telephone.[44]

Then in 1907, Wood County asked Wisconsin Telephone for a sub-licensee contract. Presumably, Wood County initiated the negotiations due to its customers' demand for long distance connections, something the Independents had promised but had not satisfactorily delivered. The terms offered in 1907 were not as generous as they had been when Bell made its original proposal in 1902. Bell no longer offered free telephone rentals. Wood County accepted the contract and, thereby joined the increasing number of Independent Wisconsin firms which reached the conclusion that the public value of Bell's toll system surpassed the potential benefits of an alternative toll network (see table below).[45]

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[44]Quote from article by Gaynor, Telephony 6 (1903), p. 169; Minutes of the Board of Directors, Wood County Telephone Company, June 13, 1903; Telephone Securities Weekly, August 31, 1907, p.8; and Whitney, p.11.

Sub-licensees received a smaller proportion of the toll revenue as a sub-licensee than as a member of the Independent network. Atwater, p. 41, 63-4; Jefferson Telephone Company, "52 Years of Progress in the Independent Telephone Company," n.d., p.6, MIT; and Contract between Knapp Telephone Company and Tri-State Telephone Company, December 11, 1914, General Telephone Company Archive, Wausau, Wisconsin.

[45]Minutes of the Board of Directors, Wood County Telephone, January 15 and February 12, 1907; Harry Barsantee, "The History and Development of the Telephone in Wisconsin," 10 Wisconsin Magazine of History 150, 157 (1926); and Wisconsin State Telephone Association, p. 119.

Table Two
Effect of Sub-Licensee System on Wisconsin Telephone's Share of the Market[46]

Year	1907	1902
State Population	2,127,974	2,292,911
Stations, All Systems	62,992	158,875
Bell Stations	26,771	69,780
Independent Stations	36,221	89,095
Independent Stations exchanging service with the Bell System (sub-licensee stations)	1,668	36,366
Percent Bell Stations	42.5%	43.9%
Percent connected for exchange service Bell and Independent	45.1%	66.8%

As shown on Table Two, the number of stations installed grew rapidly between 1902 and 1907; the number of telephones per capita increased from 2.96 per hundred to 6.93.[47] Wisconsin's Telephone rate-of-growth was about equal to that of the state; in both years it served about 43% of the market. But, because of its sub-licensee contracts, the percentage of customers who were part of the Bell network increased almost twenty-two percent. Therefore, while, in 1902, a majority of the telephone subscribers were not a part of the Bell network, by 1907 this was no longer the case. In that year, even though the Wisconsin Independents were still strong in many markets, their position had been weakened. In order to reverse the tide, they had to gain entry to the Milwaukee market. Without a terminus in Milwaukee, the Independents' toll system was incomplete. This, in part, explains their failure to construct a toll system. The attempt to enter Bell's monopoly exchanges is discussed below.

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[46]Bureau of the Census, Telephones: 1907, pp. 16, 22, and 51; Wisconsin Telephone News 1 (December 1906); and Leverett, Sherwin, and Drine to Fish, November 13, 1905, box 1184, AT&TCA.

[47]During the same time period, the number of phones per capita for the nation increased from 3.02% to 7.15%. Bureau of the Census, Telephones: 1907, pp. 16, 51.

Entry

In order to complete their network, the Independents had to obtain franchises in the markets in which they had not established a presence and raise the capital for these projects and their toll lines.

Entry into cities which were the monopoly domain of Bell would not only establish the potential of a network that was as extensive as Bell's, it would also destroy one of Bell's major financial advantages. Where Bell faced competition, it was often operating at a loss, as was the Independent company. Fearing that their rival might not match a rate increase, neither party was willing to raise rates. The financial consequences of this were less severe for Bell, because it was able to cover its losses with the monopoly profits earned in exchanges where it did not face competition.[48] Bell often tried to regain complete control of the market by driving the Independent out of business through non-compensatory rates. In the Mid-west, Bell publicized its aggressive positions as a warning to potential entrants. The earnings of the unified network were able to cover the losses at competitive exchanges.[49] By retaining a system-wide earnings level that was judged satisfactory by investors, AT&T was able to raise capital for the operating companies which faced intensive competition. Without this assistance, they, like the Independent exchanges at competitive points, would have

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[48]Fish to Burt, PLB v. 40, August 19, 1905; "To the Citizens of Madison: Statement Issued by Dane County Telephone," 1906, WSHS; Minutes of Director's Meeting, Central Union Telephone Company, January 20, 1897 and March 18, 1908, AT&TCA; Wall Street Journal, April 2, 1906; Commercial and 84 Financial Chronicle, April 6, 1907, p. 816; Merchants' Association of New York, "Inquiry Into Telephone Service and Rates in New York City," 1905, AT&TCA; and Stehman, p.139-41.

[49]Whitney, p.3; Wisconsin State Journal, March 2, 1896; 16 Western Electrician 98, 180, 185 and 186; Telephone Securities Weekly, April 13, 1907; and 90 Telephony pp. 1-8 (March 13, 1926).

had trouble raising capital.[50]

If Bell had been unable to cover its losses at competitive points with earnings from monopoly exchanges, it would have been on a more equal financial footing with the Independents. As the situation existed circa 1905, the Independents knew that Bell did not need to raise its rates at competitive points in order to achieve a company-wide, satisfactory earnings level. If competition was nationwide, it would have been easier for the Independents to raise their rates in conjunction with Bell. Therefore, regardless of the demand for toll service, entry into the monopoly exchanges was crucial to the long-term success of the Independents. Even if the new exchanges were not profitable, the Independents reasoned, on a system-wide basis the net-benefit would be positive. What they needed was an organizational structure, such as AT&T's, that could accept losses in certain markets so that the firm's overall market position could improve.[51]

Entry into a city involved four steps. First, the promoters had to determine if the public was interested in subscribing to an Independent telephone exchange. Next, if the interest was sufficient, the promoters would request permission from the local government for use of the city streets and right-of-way. The third step was obtaining financing. Finally, after steps two and three had been completed, construction could begin.

The promoters concluded that there was strong public interest in establishing

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[50]Vail, p. 231-2; 241. This deep-pocket advantage at competitive points was a major advantage to the BOCs for being part of the AT&T network. AT&T was willing to incur losses for an extended period of time in order that its network could be dominant throughout the nation. "Brief and Argument for Appellant, American Telephone and Telegraph" p. 21-25. Ironically then, long-distance service was the key to Bell's success in the mid-west. The success was not due to large scale customer demand for the service--instead it was due to financial integration and AT&T's vision of having one unified nationwide network.

[51]Whitney, p.32.

competitive exchanges in cities in which Bell had a monopoly. In some cities, obtaining a franchise was dependent on the outcome of a public referendum. Where referendums were held, the majority of the cities' citizens supported competition. In 1906 and 1907, Denver, Omaha, Portland Oregon, and San Francisco held referendums and the majority sentiment at each point was pro-competition.[52]

While the majority favored competition, the business community was more likely to oppose competition. It was that class of customers, in order to remain within easy reach of all clients, who were most likely to rent lines from both carriers. Because of the public-good nature of telephony, business customers felt that they needed to subscribe to both systems. Consequently, the benefits of competition were less clear for them.[53]

Once the promoters had determined that there was sufficient demand for an Independent exchange, they set out to secure a franchise from the local government. The process for the Independents was different than it had been for Bell. When the telephone was invented in 1876, it was a technological breakthrough which fascinated people around the nation. Cities were anxious to grant a franchise to Bell because the establishment of a telephone exchange was a sign of a vibrant local economy. The franchise granted the telephone company use of the public right-of-way; few requirements were placed on the BOCs.[54]

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[52]The margin of victory was sizeable. In Omaha and Portland sixty-eight and ninety-six percent of the voters respectively favored telephone competition. Telephony, December 1906, p.358; and Jesse Weik, "The Telephone Movement: Another Point of View," Atlantic, p. 267-8, November 1906. See, also, the testimony of H.D. Critchfield before the "Wisconsin Joint Committee on Transportation: Hearings on Public Utilities Bill. Hearing on Number 933A," May 21, 1907, p.51.

[53]Merchants' Association of New York, p.34-5, AT&TCA; Telephone Securities Weekly, December 28, 1907, p.3; and Harry P. Nichols, "Report of the Bureau of Franchises Upon the Application of the Atlantic Telephone Company," October 12, 1905, p.17, AT&TCA (hereafter "Report,").

[54]Stehman, p. 119-20

When the Independents petitioned for a franchise, Bell had already established a presence in most major commercial centers. Municipal officials were as aware as the Independent promoters of Bell's large earnings during the patent period. This knowledge, along with the bidding between promoters, made it clear to the city that a telephone franchise was a highly-valued, intangible property. The present city officials, unlike those in the 1870s, were not going to give this right away. Franchise requirements included the setting of maximum rates, free telephone service to the city, free use of the telephone poles and underground conduit for fire and police lines, and royalty fees.[55] Collectively these requirements established higher operating costs for the Independents than for Bell, in short, a barrier-to-entry.

The two most important cities for the Independents to gain entry into were New York and Chicago. New York was the "keystone" of the Bell System. The nation's largest city, as well as its leading financial and commercial center, it generated large profits for the Bell System. The Independents needed to establish an exchange in New York in order to have a terminus for their toll network, and so that monopoly customers there did not cover losses of Bell exchanges elsewhere.[56]

During the period 1900 through 1907, many attempts were made to establish an Independent exchange in New York City. One of the Independents first failures to gain

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[55] 82 Commercial and Financial Chronicle 1497 (November 18, 1905); and Extract from Minutes of the (NY) Board of Estimate and Apportionment, April 27, 1906, City Record, May 1, 1906, p.3, AT&TCA.

The New Bedford, Massachusetts granted a franchise to an Independent in 1899 that was almost identical to Bell's but for, most noticeably, the city's setting of maximum rates and the requirement of fifty free telephone to the city. "Ordinance Granting Telephone Franchise to Automatic Telephone Company by Board of Public Works," New Bedford, June 27, 1899, AT&TCA.

As the size of the Independent exchanges grew, the firms discovered that the rates set by franchise were no longer compensatory. When they subsequently raised their rates, they lost some important public support. Anderson, p.80.

[56] Finance July 21, 1906, p. 91; Paul Latzke, A Fight With An Octopus (Chicago: Telephony Publishing, 1906), p.12 (quote); and Extract from Minutes of the (NY) Board of Estimate and Apportionment, April 27, 1906, City Record, May 1, 1906, p.3, AT&TCA.

entry was partially attributable to imperfect capital markets. The financial supporters of the entrant withdrew as a result of other obligations.[57] The New York Electric Lines attempt to establish an exchange failed 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 wires underground. At that time, underground transmission was experimental, and due to the uncertainty concerning the project, it was difficult to raise capital for the construction of the conduits. Empire Subway agreed to build the subways on the condition that New York City require others to use their conduit. Empire agreed to make space available to others, when available, and to rent the space at a "reasonable rate." No procedure was established to determine what constituted a reasonable rate.[58]

Neither New York Electric Lines, nor any other entrant, wanted to rely on Empire for subway space. They were concerned that Empire would not make available the necessary space. Furthermore, where Empire did make space available, the rates appeared to be unreasonably high.[59] Despite these unfavorable conditions of entry, the Independents had no alternative once the aforementioned court ruling was issued.

The Independents last major effort to enter New York City was made by the Atlantic Telephone Company in 1906 and 1907. After extensive investigation, the Board of Estimate and Apportionment granted Atlantic a franchise in June 1907. Atlantic never

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[57]Federal Communications Commission, p.131.

[58]People ex. rel. New York Electric Lines Co. v. Ellison, 81 Northeastern Reporter 447, 449 (1907); Laws of 1884, ch. 534; Laws of 1885, ch. 499; and Merchants' Association of New York, p.15.

[59]Finance, September 1, 1906, p. 284; Report of the Joint Committee of the Senate and Assembly of the State of New York Appointed to Investigate Telephone and Telegraph Companies (Albany: J.B. Lyon Co., 1910), p.237-8; and Federal Communications Commission Accounting Department, "Report on American Telephone and Telegraph Company Corporate and Financial History," Special Investigation Docket No. 1, volume III, appendix 14.

began construction due to certain conditions set forth in the franchise. Like New York Electric Lines, it could not construct its own underground subways. Instead it would have to rent space from Empire. For Atlantic, two of the more objectionable franchise clauses were the initial $250,000 licensing fee and a prohibition on the issuing of stocks or bonds without first obtaining the permission of the Board of Alderman. Bell was not subject to either of these two requirements.[60]

A fourth part of the franchise best illustrates the difficulties the entrants faced. Within six months of accepting the franchise, Atlantic was required to show the city contracts which 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.[61] This toll connection clause required Atlantic to offer its subscribers the same ubiquitous service as was available on the Bell network. While this was certainly an objective of the Independent movement, and Atlantic could hardly object to it in principle, as a practical matter it was virtually impossible to achieve.

Nearby, Connecticut, at the urging of Southern New England Bell, had passed a law, in 1899, that essentially established an unregulated monopoly. An entrant had to obtain a special charter from the Connecticut legislature, as well as a finding by a superior state court that necessity required the establishment of a new entrant. While a modification to the law in 1907 made it necessary only to obtain a finding by the court, it was still the case that entry was difficult or impossible in the state. Furthermore, while a franchise was granted to an Independent firm in Boston in 1907, the

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[60](New York) City Record, June 25, 1907, p.3-4, AT&TCA; and Telephone Securities Weekly, June 29, 1907. Eight months later, the city agreed to modify the licence fee. Ibid., February 22, 1908, p.5.

[61]The toll rates were required to be no more than 75 % of Bell's current rates. New York City Record, June 25, 1907, p.6, AT&TCA.

Massachusetts State Supreme Court ruled that the grant was too vague and therefore unconstitutional.[62]

An Independent serving Chicago faced a different problem. The market surrounding the "windy city," with the exception of Milwaukee, was equally shared by Bell and the Independents. Instead, the Independent faced the problem of obtaining permission to serve the entire city. As early as 1903, Chicago had had two telephone companies. Chicago Bell Telephone served the entire city and the Illinois Tunnel Company used its underground rail tunnels as conduit for its connections to business customers in the downtown loop area. While Illinois Tunnel succeeded in obtaining a large number of business customers, partly due to the use of more advanced switching equipment, it did not extend its network beyond the area served by its rail system. Neither did it offer toll service.[63]

In 1907, the city council of Chicago rejected a petition by a second Independent firm, the Manufacturers Telephone Company, to construct an exchange that was as ubiquitous as Chicago Bell's facilities. The council found that the proposed rates were unreasonably low and, therefore, concluded that the petition was not credible.[64] Instead, it accepted Bell's request to have its franchise extended in exchange for rate regulation. Like the Bell operating companies in Milwaukee and New York City, Chicago Bell took a

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[62] Laws of Connecticut 1899, ch. 158 and 1907, ch. 245; "Judiciary Telephone Committee Hearings: Connecticut," (1905), p. 616-7 and (1907), p. 149-55, AT&TCA; and Metropolitan Home Telephone Company v. Emerson, 202 Mass. 402 (1909).

The 1899 law caused the Telephone, Telegraph and Cable Company great concern when it was trying to establish an Independent network in the East. Financing was conditional on overcoming this legal, barrier-to-entry. 69 Commercial and Financial Chronicle 1223 (December 16, 1899).

[63] C.F. Cutler to F. Fish, August 23, 1907, box 1357, AT&TCA.

[64] Telephone Securities Weekly January 11, 1908, p.3. The Independents interpreted this as a rejection of Manufacturer's petition, which they too found not to be credible, rather than a rejection of the concept of telephone competition. Regardless of the correctness of the interpretation, the rejected petition was a great blow to the Independent movement.

leading role in proposing rate regulation as a substitute for competition.[65] Strategic use of the administrative process was an effective means of taking the steam out of the Independent movement at these competitive points. In Milwaukee, the uncertainty surrounding state regulation deterred potential investors.[66] In Chicago, it provided the council with an alternative to competition, and in New York, the laws of Connecticut effectively prevented entry into that city. In short, strategic use of the administrative process proved effective in blocking the Independents from establishing a presence in these major markets.

The differences between the franchises which were to Bell granted to Bell and those which the Independents received emphasize the value of being first in a market, and the difficulty of establishing a network. While there was widespread public support for competition in New York, city municipal regulations made it difficult for the Independents to establish a presence. These regulations were not established for the purpose of limiting wasteful duplication of equipment or to provide protection to a non-sustainable, regulated, natural monopoly. Instead, they existed largely to gather as much economic rent for the city government as possible. While it is conceivable that these regulations inadvertently promoted economic welfare by deterring duplicative investment, since the technology of the era exhibited diseconomies of scale, it was not necessarily the case. More importantly, what waste did occur from telephone competition, as with competition in any industry, must be balanced against the dynamic gains of

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[65]Wisconsin Telephone Company, "Telephone Talks," no. 4 and 8, 1906, Wisconsin State Historical Society; New York Herald, May 26, 1906 cited in Daily Telephone News, May 26, 1906; Minutes of Directors of Chicago Telephone Company, AT&TCA.

The early regulatory history of the telephone industry comports with Gabriel Kolko's hypothesis that regulation was largely sponsored by large incumbent firms as a means of establishing market order. The Triumph of Conservatism: A Reinterpretation of American Economic History, 1900-1916 (New York: Free Press, 1963).

[66]Telephony, February 1908, p.96 and March 1908, p.206; and Milwaukee Journal, May 8, 1907.

rivalry.

Capital Markets

The construction of a network, as well as the establishment of an exchange in a large city required a large amount of capital. While there was a strong interest in the Independents extending their network, they needed support from the financial community. In medium and small cities, the Independents were able to rely on local support for the financing of their exchanges. Nevertheless, this mode of operation was not feasible for large scale exchange entry in 1907. The entrant in Wausau, Wisconsin, in 1895, constructed an exchange for its 117 customers for less than $10,000. By contrast, the fixed capital requirements for 110,000 subscriber exchange in Chicago, in 1907, were at a minimum, forecasted to be $15 million.[67]

The construction of a toll network relied on financial markets for financingto an even greater extent. Unlike exchange construction, the benefits of a toll network were diffused. What money could be raised for telephone projects in mid-sized cities and towns went towards financing local expansion; little or no money was available for toll

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[67]Roy A. Atwood, "Telephone and Its Cultural Meanings in Southeastern Iowa, 1900-1917," p. 84, 117, 179, and 393 Ph.d. dissertation, University of Iowa, 1984; Wisconsin State Telephone Association, On the Line: A History of the Telephone Industry in Wisconsin (Madison: Wisconsin State Telephone Association, 1985); Circular from "Office of Wausau Telephone Company, February 16, 1897, DCTP, p.2; and John A. Gaynor, letter to S.C. Thayer reprinted in "Telephone Service at Cost: The Wisconsin Valley Plan," Solon C. Thayer, 1905, p. 19.

Many of the first Independents were financed through customer contributions. In order to obtain service, a customer had to purchase a share of stock for approximately $50. Ibid. This mode of operation was not used in the larger cities. The difference may be attributable to Bell's having better developed the market in large cities. It would not have been good marketing if the entrant limited his service to the more wealthy customers.

lines.[68]

The Independent firms serving these smaller towns had trouble raising capital either individually or collectively, since out-of-city financiers were reluctant to lend money to utilities which served communities of less than 50,000 to 100,000 people. The financial community was concerned that there was some liklihood that the population of smaller cities would decline, and then the loan would not be repaid. In Wisconsin, despite the fact that the Independents controlled fifty percent of the market at competitive points, they were unable to raise money for a state toll system, in part, because no city, outside Milwaukee, was as large as 50,000 people.[69]

Financing a telephone network even strained the resources of AT&T. During the presidency of Frederick Fish, 1901-07, it had become the Company's policy to try to occupy the field to as great an extent as possible. This involved constructing new exchanges, financing the reconstruction of existing exchanges, extending and enforcing its toll network, and providing financial assistance to licensees and sub-licensees.[70]

In early 1906, AT&T faced a cash-flow crisis. The large capital requirements had outstripped the firm's financial resources and it was forced to limit the work of the operating companies to extensions and additions that were "absolutely essential."[71] Recognizing that its long-term success was dependent on the extension of its network, Fish negotiated a new financing agreement with its investment bankers. While previously

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[68]Telephone Securities Weekly February 22, 1908, p.4; 30 Western Electrician 422-23 (December 13, 1902); and Wisconsin State Journal, March 7 and 8, 1907.

[69]Frank A. Vanderlip, "Address to National Electric Light Association," June 1909, Vanderlip Collection, Columbia University, box D-13; 18 Telephony November 13, 1909; Bureau of the Census, Thirteenth Census of the United States: Population 1910 (Washington: Government Printing Office, 1913), 3:1050; and Hall and French, "Status of Competition," n.d., box 65, AT&TCA.

[70]Garnet, p.127; Fish to A. Burt, February 14, 1903, PLB, v.26; and Atwater, p. 144.

[71]Fish to Burt, January 27, 1906, v.46 PLB, and July 20 (quote) and 28, 1906, v.5, Fish's private correspondence, AT&TCA; and Garnet, p.127.

relying on competitive bidding, Fish negotiated a large, exclusive financing agreement with a syndicate of Kidder Peabody, J.P. Morgan, Kuhn, Loeb and Baring Brothers of London. In addition, for the first time, the firm issued convertible bonds.[72]

The financing agreement was for $150 million over a three-year period. Despite being lead by leading bankers of New York, Boston and London, as well as additional support being obtained from financial underwriters in Paris and Amsterdam, the bonds were rejected by the market. The public purchased only ten percent of the bonds; the remainder stayed in the hands of the underwriters. Nevertheless, the underwriters met their commitment to AT&T and provided the needed capital.[73]

The Independents did not meet with similar success when they tried to tap the more mature financial markets. While AT&T's securities were listed on, among other exchanges, New York, Boston, Chicago and London, the Independent's never succeeded in getting their securities listed on these markets. From 1902 forward, the Independents spent a great deal of energy trying to gain access to the New York market. They felt that if they could sell their securities there, they would be able to complete their network.[74]

At the start of the twentieth century, the New York exchange had just begun handling

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[72]Federal Communications Commission, pp. 90-91; and U.S. Temporary National Economic Committee, Investigation of Concentration of Economic Power: Hearings (Washington, D.C., 1939-1941), p. 11839-41.

[73]Ibid., p.12154. During this same time period, quite a few large bond offerings failed. The financial press attributed this, in part, to the 1906 fire in San Francisco. Because of the large losses incurred, the insurance companies were not in the position to purchase their normally large amount of bonds. See, for example, Finance, August 16, 1906, p.235.

[74]4 Telephony 4,and 6 (1902); 5 Telephony 114-16, 203-05 (1905); 15 Telephony 137 (1908); Telephone Magazine 5 (1903); and 33 Western Electrician 443 (1903). At least one Independent firm, Interstate Telephone Company, was listed on the Chicago market. The volume of transactions handled on the Chicago market was quite small relative to New York. Telephone Securities Weekly, June 15, 1907, p.14; ;and Fritz Redlich, The Molding of American Banking: Men and Ideas (New York: Hafner Publishing Co., 1951), 2:391-2.

large industrial security issues (telephony was considered an industrial product). The market, due to unfamiliarity with the industry, showed some reluctance in its support of the more familiar stock of the Bell System. The stock market exhibited even greater hesitancy toward the securities of the Independent companies. The Independents believed that one reason for this was that the east had less direct contact with the entrants. The financiers in the east had little understanding of why the Mid-west had so strongly embraced the Independents.[75]

While there were many financial magazines and newspapers during this period, none gave extensive coverage to the Independents. Rarely did an article appear that discussed the financial standing of these firms, but when one did appear, there was a high probability that the piece had been written by the AT&T publicity department. The article would then be placed in a newspaper as a paid advertisement, but not identified as such. During this time period, advertisement space could be obtained in newspapers for the placement of articles with no attribution to the true author. The articles placed by Bell were intended to discredit investment in the competing firms.[76]

Neither were there any major security rating services. Moody's, for example, did not directly rate the soundness of different securities. What the firm did suggest though was that investors learn from the habits of more sophisticated buyers. Moody's Classified Investments suggested that an investor could infer that a security was relatively safe if leading banks and financial institutions included the item in their portfolios. The investment manual presented a list of the securities held by large

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[75]Temporary National Economic Committee, p. 11834, 12126; Wall Street Journal, April 14, 1904; Weik; and 5 Telephony 40 (1903).

[76]N.M. Cole to F. Fish, April 16, 1904, box 1363, AT&TCA; L. Richardson to F. Fish, July 19, 1906, "Read,"; W. Allen to L. Richardson, August 6, 1906, "Read;" Boston Press Bureau; Milwaukee Free Press, May 2, 1907; Milwaukee Daily News, May 20, 1907; Milwaukee Journal, July 22 through August 5, 1907; Telephone Securities Weekly, July 13, and August 3, 1907.

institutions. The Independent securities, unlike Bell's, were not widely held by the large financial institutions in the east. Based on the information found in Moody's, an investor could induce that the Independent securities were relatively more risky than Bell's. If risk-averse, small and medium sized investors were to rely on this firm's investment method, the Independents would not be able to sell to those investors until they had first succeeded in convincing large financial institutions to invest in their securities.[77]

On the other hand, the large investors 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 financing for only one firm--AT&T; to do otherwise would have promoted competition. These underwriters were also closely tied in with other large financiers.[78] Through these relations, the financial syndicate was able to deny the Independents access to certain sources.

For example, in 1902, Milwaukee was about to grant a franchise to an Independent telephone company. The primary financial backer of the potential entrant was George

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[77]Moody's Classified Investments (New York: Moody Corporation, 1905), p. 7-8. Investors could obtain financial statements from different journals and magazines, but because there were no accounting standards at the turn of the century, the information had limited value.

There were frequent allegations that Bell and the Independents were overcapitalized. AT&T was overcapitalized in the sense that the par value of outstanding stock exceeded tangible assets. 1 Moody's Magazine 132-33 (June 1906) and 270-1 (February 1906). It was not overcapitalized in the sense that it was always able to pay a competitive dividend and no stock was issued at below par. A competitive dividend could be sustained only so long as AT&T was the sole supplier in Boston, New York, Chicago and Milwaukee.

The Independents had also issued stock whose par value exceeded tangible assets, but unlike Bell, they often could not pay a competitive dividend due to their failure to gain entry into the leading markets of the nation. This overcapitalization does not explain why they were unable to raise capital. The white knight would have been able to buy the securities at their market, rather than their par value.

[78]Testimony of Leroy Kellogg, in "Read," p.8464, 8519; John Moody, The Masters of Capital: A Chronicle of Wall Street (New Haven: Yale University Press, 1919), p. 117-8; and Morton Keller, The Life Insurance Enterprise, 1885-1910: A Study in the Limits of Corporate Power (Cambridge: Harvard University Press, 1963).

Sheldon. Sheldon, who was a member of the New York Stock Exchange, believed that the Milwaukee market provided a profitable opportunity for investors. After getting word of Sheldon's intentions, AT&T's President Fish asked an officer of the J.P. Morgan & Company to talk to Sheldon about withdrawing his support.[79]

George F. Baker and an associate from J.P. Morgan & Company subsequently convinced Sheldon that he should withdraw his support for the entrants or risk endangering financial relations with Morgan. According to Sheldon, if he had continued to provide financial support, the franchise would have been granted by the city.[80]

While there is no evidence in the AT&T archive that Morgan interfered with Milwaukee Independent's capital raising efforts in 1907, it is the case that Morgan's ties with AT&T were even stronger in 1907 than 1902. Furthermore, Morgan's role as the lender of last resort during the panic of 1907, had increased the number of financiers who were indebted to him. These investors would be hesitant to place money in firms that competed with Morgan's interests.[81] According to the Federal Communications Commission, the financial connection between the Baker-Morgan group and AT&T effectively restrained the Independents from obtaining capital from many financial groups. This blockage was

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[79]Fish to Charles Steele, June 19, 1902, v.1 Fish's private correspondence; and George Sheldon to Fish, July 30, 1902, box 66, AT&TCA.

While this episode does not "prove" that their were capital market imperfections, it does demonstrate that financial associates could be used, at a minimum, to delay the development of the Independent network. The president of Central Union highly valued these delays. Richardson to Fish, October 26, 1905, in "Competition, Opposition, Mergers, Connection with Independents," "Read." As discussed above, time was important. Frustrated with the delays in gaining access to an extensive toll network, Independent firms abandoned the coalition.

[80]George Sheldon to Fish, 7/30/02, box 66, AT&TCA.

[81]Federal Communications Commission, pp. 87-93; Cochran, American Business System, p.82-5.

AT&T was also able to impede other Independent projects by relying on other alliances. A. Wheele to F. Fish, 1/26/04, box 65, W. Gentry to Fish, September 1901, box 1326, T. Vail to Messrs. Baring Bros., July 15, 1909, box 65, AT&TCA; Hill, p. 4992-3; and Federal Communications Commission, p.139.

especially damaging to large investment projects. In its 1939 report to Congress the Commission concluded that:

> This slow financial strangulation of attempts to develop large competing independent systems was an important factor in regaining for the Bell System its former position of monopoly in the telephone field.[82]

The power held by the Baker-Morgan syndicate was an outgrowth of the lack of alternative information sources. Since there was insufficient impartial market analysis, people relied on the expert judgement of a few, large investment firms. As these firms were interested in establishing market order, that is, limiting competition, capital market imperfections limited the extent to which the Independents could obtain financing for their networks.[83]

The Independents tried to overcome this problem by providing information to eastern markets and by establishing a telephone stock exchange in Milwaukee.[84] When these projects failed, the Independents had to rely on the regional stock exchanges: Cincinnati, Columbus, St. Louis, Toledo, Minneapolis and Cleveland. These stock exchanges however were inadequate for the task. For example, Cleveland was one of the

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[82]Federal Communications Commission, p. 139.

[83]Vincent Carosso, The Morgans: Private International Bankers, 1854-1913 (Cambridge: Harvard University Press, 1987), 288, 464, 645.

Lance Davis identifies three types of "shocks" that can limit the free flow of capital: "a geographical shift in the location of an industry, [...a change in] the industrial composition of output," and requirements of large-scale entry. According to Davis, certain firms prospered because they had special ties to financiers. "The Capital Markets and Industrial Concentration: The U.S. and U.K., a Comparative Study," 19 Economic History Review 255, 256, 264-5 (1966). Chandler rejected Davis's assertion that personal connections were crucial to the success of a firm. p. 373. The telephone industry exhibited the type of shocks identified by Davis. Furthermore, the Independents found, counter to Chandler's model, that they could not rely on internal cash flow for financing growth. Where dividends were reduced to finance expansion, the capital markets refused to provide additional external financing. Telephone Securities Weekly, November 30, 1907, p.4.

[84]30 Western Electrician 257, 263, 422-27 (1902) and v.32, p.350 (1903); 5 Telephony 40 (1903); Telephone Securities Weekly; and Dickson.

largest regional stock exchanges. In 1906 the number of shares traded in Cleveland was less than one percent of the volume on the New York Stock Exchange.[85] Considering that the New York market had difficulty meeting the financial requirements of AT&T, it was even less feasible for these smaller exchanges to handle the large capital requirements of a telephone network.

In addition, the regional stock exchanges were quite risky for the investors. On the relatively large Cleveland Stock Exchange, weeks could go by without any bids being made on the stock of the leading Independent toll company of the Mid-west, the United States Telephone Company. On the smaller Toledo exchange, sometimes days would pass when there was no bids on any of the securities (most of the stocks being non-telephone firms).[86] The lower liquidity levels on the regional markets made securities traded on these markets more risky than stock sold in New York.

Regardless of whether the market was in the East or the Mid-west, investors were aware that AT&T had a major institutional advantage over its rivals. A critical criteria 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.[87] As discussed earlier, the Independents operated at a great disadvantage as a result of the franchise requirements established by cities. The Independent often faced rate regulations that were not part of the charter of the BOCs. Consequently, the Independents faced a more constrained opportunity set. These limitations made the Independents' bonds less attractive.

In order to overcome this disadvantage, the Independents had to build their success on their popular appeal--a non-tangible asset that was very powerful in 1894, but was

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[85] Journal of Commerce and Commercial Bulletin, January 3, 1907; and Finance, February 9, 1907.

[86] Finance.

[87] Vanderlip.

diminishing over time as they failed to construct an integrated network. The leaders of the Independent movement were willing to sacrifice the short-term advantage of relying on local financing and being known as the "home company," in exchange for the long-term benefit of being part of an integrated network. Failure to achieve this goal is largely attributable to government regulations and the structure of the capital markets.