

DIVESTITURE, SPIN-OFFS, AND TECHNOLOGICAL CHANGE IN THE TELECOMMUNICATIONS INDUSTRY — A PROPERTY RIGHTS ANALYSIS

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INTRODUCTION

In the second half of the nineteenth century, the American economy went through a significant structural shift. A web of railroad lines, canals, and turnpikes increasingly linked previously isolated regional markets. During the 1890s, the development of long-distance telephone service further aided the emergence of national markets. This new service helped firms keep abreast of developments in far away markets.¹

The rapid movement of information continues to be important in today's economy. Developing and processing information are integral to remaining competitive in national and international markets. Just as railroads improved the delivery of goods one hundred years ago, today's telecommunication networks accelerate the delivery of information. These networks are a crucial part of the infrastructure needed for the growth of the economy.²

Although the new technologies of yesterday and today have increased the nation's output, not all groups see these changes as improving their economic welfare. Depending on how the costs and gains are distributed, some customers or financial groups may be hurt by the changes associated with new production processes. Jonathan Hughes, a prominent economic historian, has argued that governmental controls of

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1. See generally A. CHANDLER, *THE VISIBLE HAND: MANAGERIAL REVOLUTION IN AMERICAN BUSINESS* (1977).

2. OFFICE OF TECHNOLOGY ASSESSMENT, *TECHNOLOGY AND THE AMERICAN ECONOMIC TRANSITION: CHOICES FOR THE FUTURE* (1988).

economic activity, such as regulatory commissions and antitrust laws, serve to offset free market decisions that would otherwise result from technological innovation. Where vocal sectors of the body politic begin to lose advantages in the wake of technological change, they may lobby for non-market controls that mitigate or eliminate the dislocations from technological change.³

Conflict associated with technological progress is not limited to the more well-known cases of entrant firm versus incumbent firm, or customer group versus supplier. The introduction of new production processes can lead to conflicts between different groups within a business—such as workers versus management and majority versus minority stockholders—concerning the sharing of gains from these new processes. This Article will discuss how the gains from technological change should be allocated in the telecommunications industry. Part I examines an unreported court case involving a dispute about sharing the gains from the new technology that made long-distance telephone service viable at the start of this century. In *Read v. Central Union Telephone Company*,⁴ the court ordered divestiture of the American Telephone and Telegraph Company's ("AT&T") midwest operating company, Central Union Telephone Company ("Central Union").⁵ In part, the court ordered divestiture because the minority stockholders of the operating company had paid for part of the cost of the technological change, and then were denied the opportunity to share the associated gains by actions of the majority stockholder, AT&T. Part II explores the extent to which the protection provided to minority stockholders by the court in *Read v. Central Union* should be used as a standard to resolve current disagreements between telephone utilities⁶ and their customers that results from technological change. Both Part I and Part II begin with a summary of the factors that motivated corporate officers to introduce new production processes.

3. See generally J. HUGHES, *THE GOVERNMENT HABIT* (1977).

4. Chancery General No. 299,689, slip op. at 84 (Super. Ct. Cook County Ill. July 10, 1917). There was an initial opinion on January 20, 1917 [hereinafter *Read v. Central Union* (Initial Opinion)] and a final decree on July 10, 1917 [hereinafter *Read v. Central Union* (Final Decree)] entered by Judge William E. Dever.

5. Much has been written about how conflicts between competing suppliers and between consumers and stockholders have led to cases involving AT&T. However, there is no literature on the disagreement between the minority and majority stockholders of AT&T's Midwest operating company, Central Union. See, e.g., Peters, *Is the Third Time the Charm? A Comparison of the Government's Major Antitrust Settlements with AT&T this Century*, 15 SETON HALL L. REV. 252 (1985).

6. Hereinafter, telephone utilities, local telephone companies, and exchange companies are used synonymously.

I. EQUITY WITH TECHNOLOGICAL CHANGE: THE 1917 COURT ORDERED DIVESTITURE OF AT&T'S MIDWEST HOLDINGS

A. *The Early Market for Long-Distance Telephone Service*

In 1893, Alexander Graham Bell's telephone patent expired. Almost overnight, competitors of AT&T, known as Independent Telephone Companies ("the Independents"), sprung-up around the nation. The high profits earned by AT&T during the patent monopoly period and the widespread customer dissatisfaction with the quality of AT&T's telephone service attracted the Independents to the industry.⁷

The Independents were most successful in the Midwest, and least successful in the East.⁸ Central Union, AT&T's operating company in Indiana, Illinois, and Ohio, fared especially poorly. Not only did Central Union's market share quickly fall from 100% to less than 50%, Central Union also suspended dividend payments in 1894. Throughout the competitive period from 1894 to 1913, Central Union operated at a loss.⁹ Despite operating at a loss, Central Union obtained money, mostly in the form of long- and short-term loans,¹⁰ from AT&T to expand and upgrade its system. AT&T provided the money because it felt that its long-term success would be enhanced through the construction of an integrated, national network.

With the advent of competition, AT&T announced that it would respond aggressively to entry, rather than as a cooperative duopolist.¹¹ AT&T adopted this type of response to signal entrepreneurs considering entrance into its profitable monopoly markets that competition would cause both firms to lose money. By establishing this reputation, AT&T likely deterred entry and thereby improved its long-term profits. Therefore, in order to develop its nationwide network, as well as to protect its other monopoly operating companies, AT&T had Central Union adopt

7. D. Gabel, *The Evolution of a Market: The Emergence of Regulation in the Telephone Industry of Wisconsin, 1893-1917*, at 42-82 (Ph.D. thesis, U. Wis. Madison, 1987).

8. U.S. CENSUS BUREAU, *TELEPHONES AND TELEGRAPHS AND MUNICIPAL ELECTRIC FIRE-ALARM AND POLICE-PATROL SIGNALING SYSTEMS: 1912*, at 35 (1915).

9. *TELEPHONE SECURITIES WEEKLY*, Apr. 18, 1907, at 7.

10. *Read v. Central Union* (Initial Opinion), slip op. at 41.

11. A cooperative duopolist shares the market with its one rival, agrees to charge a supracompetitive price for the product, and earns above normal rates-of-return. Dixit & Avinash, *Recent Developments in Oligopoly Theory*, 72 AM. ECON. REV. PAPERS & PROC. 12-15 (May 1982).

policies that were in the best interest of AT&T's nationwide system.¹² Policies that aided AT&T did not, however, necessarily benefit its local operating companies. Depending on how the gains and costs were split between AT&T and Central Union, other stockholders of Central Union could be damaged.

Until 1892, AT&T had tried to develop long-distance service by constructing a separate toll network. The clarity of the connections on the existing local exchange networks was inadequate for long-distance calls. The long distance network involved connecting a customer to a switchboard through two wires, known as a metallic loop. Local service, on the other hand, was provided over only one wire, known as a grounded loop. Using a second wire on the toll lines significantly reduced the level of electrical interference. With the different wirings, each service required a different type of transmitter and switchboard. The annual, per-subscriber cost of providing service through the metallic loop system was approximately thirty-five percent higher than through the grounded loop system.¹³

The price of long-distance service reflected the cost of a metallic loop. Customers who wanted the new, long-distance service had to rent access to a separate metallic loop. They had to pay approximately twenty to fifty dollars more per year than the price of access to the local network.¹⁴ Few customers, usually wealthy residential and large business customers, were willing or able to subscribe to both systems. In order to place or receive a toll call, customers who did not rent the metallic loop had to go to the telephone company's office and use the special equipment that was available there.

The higher price for a long-distance toll line and the inconvenience of visiting the telephone company's office to place or receive a call limited the development of long-distance toll telephone service prior to 1892.¹⁵ Faced with this retarded development, AT&T's central management

12. Selten, *The Chain Store Paradox*, 9 THEORY & DECISION 127-59 (1978); L. N. Whitney, Report on Conditions in Indiana 5 (box 11, Museum of Independent Telephony); 16 W. ELECTRICIAN 98, 180, 185-86 (1895).

13. Memorandum from T. Sheridan to J. Hudson (Nov. 20, 1895) (box 1275, American Telephone and Telegraph Company Corporate Archive, Warren, N.J. [hereinafter AT&TCA]). A few years after integration began, the differences in annual operating expenses were negligible. Unsigned Memorandum: Concerning Certain Peculiar Features of Telephone Exchange Service . . . (Sept. 10, 1901) (box 12, AT&TCA). This may reflect learning-by-doing productivity gains, reduced maintenance costs, and technological research directed at improvements of metallic, rather than grounded service.

14. Memorandum from E. J. Hall to J. Hudson (Dec. 10, 1898) (box 1287, AT&TCA); Memorandum from E. J. Hall to T. Vail (July 8, 1886) (box 1011, AT&TCA).

15. Testimony of Horace F. Hill, *Read v. Central Union*, at 3006, 3575-77, 3585-86; Memorandum from E. J. Hall to T. Vail (May 12, 1885) (box 1011, AT&TCA).

concluded that the situation could be improved by redesigning the exchange network to meet the more stringent technical requirements of the toll network. This would eliminate the need for a separate, toll network and increase the number of customers who could be directly reached over the toll lines. This demand-complimentarity¹⁶ was crucial to the success of AT&T's long-distance network. In formulating the plans for the network in 1885, E.J. Hall, one of the primary architects of the long-distance system, wrote to AT&T's President Vail that "[t]he success of the long-distance business will be in proportion to our ability to connect existing exchange systems, and our income will be derived mainly from the tolls for that service."¹⁷

The integration of the two networks met with some internal resistance and delay. For example, the chief engineer of AT&T's most important local operating company, the New York Telephone Company, argued that integration would raise the cost of providing exchange service. It was not clear to the management at New York Telephone that the benefits that would accrue from increased use of its network would exceed the incremental cost of upgrading its network.¹⁸ Many other local operating companies shared this concern. They were unsure of the extent to which customers were interested in placing long-distance calls. Furthermore, the division of toll revenue procedures established by AT&T did not provide sufficient economic incentive to make it profitable for the local operating companies to promote the long-distance toll service.¹⁹

16. Goods exhibit demand complementarity if they "go together." For example, an increase in the number of personal computers increases the demand for computer floppy disks. In the case of the telephone industry, an increase in the number of customers that can be reached on a network increases the volume of calls.

17. Memorandum from E. J. Hall to T. Vail (May 12, 1885) (box 1011, AT&TCA). Three years later, Hall held the same view, but added "that the continued success of the local exchanges will be largely in proportion to their ability to connect satisfactorily with our lines." Memorandum from E. J. Hall to J. Hudson (Jan. 21, 1888) (box 1011, AT&TCA).

18. N. WASSERMAN, *FROM INVENTION TO INNOVATION: LONG-DISTANCE TELEPHONE TRANSMISSION AT THE TURN OF THE CENTURY* 38-39, 137 n. 33 (1985); Written testimony of James P. Baughman, submitted by Defendant pursuant to Pre-Trial Order No. 18, at 71, *United States v. AT&T*, 552 F.Supp. 137 (D.D.C. 1982) (No. 74-1698).

19. Memorandum from E. J. Hall to J. Hudson (Jan. 7, 1889) (copy on file with the author); Memorandum from E. J. Hall to J. Hudson (Jan. 21, 1888) (box 1011, AT&TCA); Letter from W. Whitcomb to American Bell Telephone (May 20, 1880) (box 1210, AT&TCA); Memorandum from Chas. J. Glidden to O. E. Madden (May 18, 1880) (box 1210, AT&TCA).

It is not surprising that the local managers were unsure about toll service. As a new, unproven product, the uses and the market were largely undefined. E. J. Hall stated in 1885 that "it would be impossible for anyone to so forecast the future as to settle all the questions which will arise in a business so entirely novel and containing so many unknown factors." Memorandum from E. J. Hall to T. Vail (May 12, 1885) (copy on file with the author).

On a system-wide basis, the benefits of integrating long-distance toll service with local service exceeded the costs. But AT&T's local operating companies received little of the direct benefits associated with upgrading the network. The local operating company paid the capital costs of upgrading the network. Although AT&T did pay its operating companies a fee for connecting its long-distance toll lines to the local switchboard, the local companies did not find this payment adequate. It may have covered the additional operating expenses associated with billing and handling toll traffic, but it did not cover the incremental capital expenses of building the integrated network.

B. Conflict Arising From Technological Change:

Read v. Central Union

AT&T did not own all of the stock of the local operating companies when long-distance service was integrated into the local network.²⁰ Unless AT&T's payment to the local company and any additional revenue received due to demand-complementarity for local service exceeded the incremental costs, the local operating companies would be financially worse off because of this integration. Even though AT&T, Central Union's majority stockholder, had an improved position due to economies of scope²¹ and demand-complementarity between toll and exchange service, minority stockholders of the local company could be damaged by phone system integration.

A few minority stockholders of Central Union claimed that their company was worse off as a result of AT&T's actions. In February 1913, after AT&T eliminated the Independents, AT&T attempted to sell Central Union's properties to other AT&T subsidiaries. The proposed sale price of \$29.6 million was less than the amount Central Union owed AT&T for its bond holdings. The purchase price, in effect, "would have eliminated the minority stockholders . . . altogether and made their stock

20. When large-scale integration of the local and toll networks began in 1892, AT&T was a minority stockholder in almost all of the local operating companies. In part, because of the local operating companies' reluctance to deploy the equipment and adopt operating procedures that would be compatible with AT&T's vision of an integrated network, the parent company increased its control over the operating companies. By 1907, AT&T had obtained majority control of almost all of the operating companies. Written testimony of James P. Baughman, *supra* note 18, at 71; R. GARNET, *THE TELEPHONE ENTERPRISE: THE EVOLUTION OF THE BELL SYSTEM'S HORIZONTAL STRUCTURE, 1876-1909* (1985).

21. Economies of scope exist when the cost of providing multiple services through one supplier is less than the sum of the costs of providing the products on a stand-alone basis.

worthless."²² On February 8, 1913, three days before the scheduled meeting to approve the sale, minority stockholders, holding less than four percent of Central Union's stock, filed suit in the Superior Court of Cook County, Illinois. They claimed that Central Union had been compelled to take on costs which were beneficial to AT&T's national position, and had received inadequate benefits in exchange. The plaintiffs claimed that if Central Union had followed a course not controlled by the interests of AT&T, Central Union's profits would have been higher.

The plaintiffs asserted that the proposed price for their stock did not reflect the going concern value of the firm, and therefore the sale amounted to confiscation.²³ For years the market price of Central Union's stock had been approximately twenty-five to fifty percent of its par value.²⁴ A low market-to-par value ratio made it difficult for Central Union to raise money in the capital markets because investors used this ratio to evaluate the soundness of a firm's finances. The plaintiffs argued that the long-term financial problems of the firm, as reflected in the low market-to-par ratio, were largely an outgrowth of the competitive war which had been waged on behalf of AT&T and the construction of an integrated network which also served the interests of its majority stockholder, AT&T. The plaintiffs believed that these sacrifices had been made with the understanding that they would share the gains once the Independents had been driven out of the market.

The court decided the case largely in favor of the plaintiffs, finding that AT&T's holdings in Central Union were made with the intent to monopolize the industry at both the regional and national level.²⁵ The judge, William E. Dever, concluded that some of the money was loaned to Central Union not for its benefit, but to help the parent company in its national fight with the Independents.²⁶ The judge ordered AT&T to bear the losses incurred due to rate cutting in proportion to the benefits it obtained.²⁷ The calculation of the appropriate charge to AT&T was to be made by a court master. Judge Dever ordered the court master to take control of AT&T's stock in Central Union, sell the shares, and then

22. *Read v. Central Union* (Final Decree), slip op. at 84.

23. *Read v. Central Union* (Final Decree), slip op. at 84. Though the vice-president of AT&T, U. Bethell, suggested that the minority stockholders be offered three shares of AT&T stock (par \$100) for eight shares of Central Union stock (par \$100), Judge Dever noted that Bethell's "suggestion [did] not seem to have been acted on in any way." *Read v. Central Union* (Initial Opinion), slip op. at 58.

24. Baskin, *The Development of Corporate Financial Markets in Britain and the United States, 1600-1914: Overcoming Asymmetric Information*, 62 *BUS. HIST. REV.* 225 (1988).

25. *Read v. Central Union* (Final Decree), slip op. at 32-33.

26. *Id.* at 74.

27. *Id.* at 76.

return the proceeds to AT&T after the transaction costs were deducted. The court indefinitely enjoined AT&T from acquiring any of Central Union's assets.²⁸

After the decision, the parties reached an out-of-court settlement.²⁹ The case is of historical importance because it suggests a mode of analysis for resolving conflicts between customers and stockholders. The sections of the decision that deal with the division of revenue and the strategic response to competition suggest particularly interesting parallels for today's conflicts arising from technological change.

1. Division of Revenue

Once toll and exchange services were provided through common facilities, AT&T established a standard procedure throughout the nation for dividing toll revenues. Starting in 1891, the local operating company through which the call originated, received a commission of fifteen percent, but not to exceed five cents for any message.³⁰ The commission was intended to compensate the local exchange company for the billing and operator costs associated with toll calls. Compensation was not provided for use of the exchange facilities, which consisted of the local switchboard and line that were jointly used by exchange and toll service.

The plaintiffs did not believe that the division of revenue was fair to the minority stockholders of Central Union. They rejected AT&T's argument that the compensation was fair as long as it covered the incremental cost of offering toll service. AT&T's calculation of incremental cost was based on the assumption that a metallic loop network already existed.³¹ The plaintiffs contended that they should receive compensation for the use of their facilities. The plaintiffs argued that since the network had been constructed to serve the common interests of AT&T and Central Union, AT&T should pay Central Union more than the additional cost of switching a toll call on a metallic network. The plaintiffs

28. *Read v. Central Union* (Final Decree), slip op. at 98-102.

29. Memorandum from N. T. Guemsey to H. B. Thayer (Apr. 10, 1919) (box 54 AT&TCA). As a result, AT&T did not have to divest its Central Union holdings.

30. The maximum payment to the operating company was increased to ten cents in 1893. III FEDERAL COMMUNICATIONS SPECIAL INVESTIGATION NO. 1, CONTROL OF TELEPHONE COMMUNICATIONS 111 (June 15, 1937); *Read v. Central Union* (Final Decree), slip op. at 47.

31. The difference may be illustrated as follows: If grounded loop technology was used to provide service, the annual cost of connecting a customer to the network was \$68. The cost of originating a local call was approximately 2.5 cents. If a metallic loop network was used, the cost of originating a call was still 2.5 cents, but the cost of connecting a customer to the network increased to \$92. AT&T provided compensation for the per call cost, but not the incremental \$24 cost associated with the change in technology.

claimed that this incremental cost did not reflect the benefit AT&T obtained from having access to Central Union's customers:

[I]t would be unfair to apply the [incremental] cost test theory . . . that in determining what would be a fair division of the joint revenue derived from this joint business the relationship should be regarded as a partnership, and that the revenue derived from the business should be apportioned to the two companies on the basis of the investment of each company in the property required for the doing of this business and the reasonable cost of operating it.³²

In essence, plaintiffs contended that AT&T, the majority stockholder, had breached its fiduciary duty to the minority stockholders. Central Union had been asked to sacrifice current earnings in exchange for future profits.³³ The minority stockholders believed that changes in the existing local exchange network were used to promote the growth of AT&T's nationwide network. Through the synergies of the local and long-distance toll system, AT&T's toll lines became profitable. The Central Union stockholders were subsidizing the cost of expanding AT&T's national network, and then, through AT&T's attempted reorganization, would not have been able to share in the income generated from this growth.³⁴ The proposed reorganization of Central Union would have denied the minority stockholders the opportunity to share the increased profits that would be realized through the elimination of competition and the growth in the demand for toll service. The court found

32. *Read v. Central Union* (Initial Opinion), slip op. at 109-10. In the parlance of telephone separations' procedures, the plaintiffs argued a station-to-station theory: Because long-distance calls use local companies' lines, the local companies should be compensated. Plaintiffs rejected AT&T's board-to-board theory, that long-distance calls are merely connections between switchboards at local companies. Termin & Peters, *Cross-Subsidization in the Telephone Network*, 21 WILLAMETTE L. REV. 199, 201 (1985).

33. "The controlling stockholder owes the corporation a fiduciary obligation—one designed for the protection of the entire community of interests in the corporation—creditors as well as stockholders." Superintendent of Ins. v. Bakers Life & Casualty Co., 404 U.S. 6, 12 (1971) (citing *Pepper v. Litton*, 308 U.S. 295, 307 (1939)). "[C]ontracts and transactions" that are unfair fail this fiduciary standard and "are voidable at the option of the corporation, its creditors or stockholders." *Wyman v. Bowman*, 127 F. 257, 274 (8th Cir. 1904). See also *Read v. Central Union* (Final Decree), slip op. at 35, 38; *Read v. Central Union* (Initial Opinion), slip op. at 88-90.

34. On the role of sponsorship in network industries, see generally Katz & Shapiro, *Technology Adoption in the Presence of Network Externalities*, 94 J. POL. ECON. 822 (1986).

this to be in violation of the prohibition of self-dealing by the majority stockholders.³⁵

The court found that the introduction of toll service through the facilities of Central Union established a "partnership." The judge concluded that AT&T's revenue sharing procedure was unfair to Central Union because the operating company had received inadequate benefits. AT&T was ordered to compensate the plaintiffs on "a fair and equitable" basis for the toll calls handled by Central Union between 1891 and 1917, as determined by the court master.³⁶ The toll revenues were to "be fairly apportioned between the two companies in accordance with the cost to each of operating the business, and the capital investment of each company in the lines, equipment and apparatus actually used in connection with said business."³⁷

2. *Response to Competition*

Besides the division of revenue, the plaintiffs also asked the court to order compensation for costs Central Union incurred as part of AT&T's national response to competition. As mentioned above, where it faced direct competition, AT&T responded aggressively. Instead of sharing the market, AT&T reduced rates to make the market unprofitable for its rivals.³⁸ As the Midwest was the area of the country in which its rivals were strongest, AT&T's aggressive response could be quite costly to the local operating companies, depending on how the cost of this strategy was shared. According to the plaintiffs, the stockholders of the local operating company had absorbed the burden of this strategy. The plaintiffs argued that compensation should be given to Central Union's minority stockholders; otherwise they would have incurred costs that were beneficial to AT&T, without receiving compensation. In response, AT&T argued that the expenditures incurred by Central Union during the competitive period were imperative to the survival of the operating company.³⁹

The court found that Central Union had absorbed the "whole burden of the fight against competition."⁴⁰ The judge found that but for AT&T's objective to control the national market, Central Union would have

35. *Read v. Central Union* (Initial Opinion), slip op. at 88-90; *Read v. Central Union* (Final Decree), slip op. at 38.

36. *Read v. Central Union* (Final Decree), slip op. at 106.

37. *Id.* at 45.

38. *Read v. Central Union* (Initial Opinion), slip op. at 135-36.

39. *Id.* at 137.

40. *Read v. Central Union* (Final Decree), slip op. at 72.

adopted a more cooperative position towards the entrants:

[H]ad the [Central] Union and [AT&T] [c]ompanies been acting independently of each other under the same conditions as actually existed in [Central] Union Company territory, it is not conceivable that the [Central] Union Company's officials would have permitted that company to have borne the full burden of this expensive fight; that in the interest of its stockholders the officers of the [Central] Union Company might have restricted the field of its operations rather than expanded it, and the court holds that thereby competition could have been met in limited territory without loss or impairment of the [Central] Union Company's capital⁴¹

Since AT&T benefitted from Central Union's aggressive response to competition, the court ordered that AT&T share the associated costs based on "the extent to which it benefitted thereby."⁴²

Central Union had helped sponsor the growth of AT&T's integrated, nationwide system, but was denied the opportunity to share in the benefits because of the contracting terms imposed by AT&T, and by the terms of sale considered by the operating company's board in February 1913. Since AT&T had abused its fiduciary relationship with the minority stockholders of Central Union, the plaintiffs were entitled to compensation. Judge Dever ordered that the relative benefits of joint undertakings be used as the method to determine the appropriate allocation of joint costs. The judge decreed that a court master should review "the contracts, dealings and transactions"⁴³ between Central Union and AT&T that were at issue in the case, and

that in so far as any funds of said [Central] Union Company were used for the joint benefit of the [AT&T] and the [Central] Union Company the master shall apportion the amount which is chargeable to each of said parties upon a fair and equitable basis, having regard to the benefits resulting to said companies respectively from the expenditures made for their joint benefit.⁴⁴

41. *Id.*

42. *Id.* at 76.

43. *Id.* at 103.

44. *Id.* at 104.

II. THE CHALLENGE OF REGULATING TECHNOLOGICAL CHANGE

A. *Redesigning the Network to Meet the Technical Requirements of Information Age Services*

AT&T decided to integrate its long-distance and local networks when it became apparent that the combination would improve its market position and profitability. Today, with the development of information age services, local telephone companies have a similar opportunity to reap the benefits of network integration and technological change. And, like AT&T in the late 19th century, local telephone companies have taken advantage of these opportunities.

Initially, local telephone companies provided data transmission and video services through facilities other than those used for plain-old-telephone service. The public switched network, which was used for plain-old-telephone service, could not be used to provide high-speed data or video services due to the transmission limitations of the voice network. As with the incipency of long-distance service, data and video services were not provided in common with plain-old-telephone service. In order to provide these enhanced services, facilities had to be conditioned to meet the more stringent technical requirements of the new services.⁴⁵ Where the local telephone companies conditioned special lines for high-speed data and video services, it was a slow, expensive process.⁴⁶ In 1982, the estimated cost of this line conditioning ranged from \$300 to \$1000 per line.⁴⁷

The local telephone companies established prices for conditioned lines that partly reflected the cost of conditioning the lines.⁴⁸ The

45. "Many of these [new data services] will require much higher performance transmission design standards than a common POTS [plain-old-telephone service] line, and . . . the existing subscriber network is basically designed for POTS circuits." Byrne, Coburn, Mazzone, Augenbaugh & Duffany, *Positioning the Subscriber Loop Network for Digital Services*, 30 IEEE TRANSACTIONS ON COMM. 2006 (1982) [hereinafter Byrne]. For a further discussion of these transmission limitations, see Arnon, Munter, Patel, Roddick & Willcock, *Customer Access System Design*, in PROC. 1982 INT'L SYMP. ON SUBSCRIBER LOOPS AND SERVICES 57 (1982) [hereinafter Arnon]; Handler & Sheinbein, *Improving the Loop to Provide New Network Capabilities*, in *id.* at 1-3; Giesken, *ISDN Features Require New Capabilities in Digital Switching Systems*, 3 IEEE J. TELECOMMUNICATION NETWORKS 19-28 (1984).

46. See Byrne, *supra* note 45, at 2006-07.

47. See Karia & Rodi, *A Digital Subscriber Carrier System for the Evolving Subscriber Loop Network*, 30 IEEE TRANSACTIONS ON COMM. 2013 (1982).

48. The price may have understated the entire cost of these emerging competitive services. See *United States v. American Tel. & Tel. Co.*, 552 F. Supp. 131, 162, 188 (D.D.C. 1982), *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983).

primary users of high-speed and video services, large business customers, were dissatisfied with the price and delay in obtaining the conditioned lines from local telephone companies. These factors encouraged businesses, schools, and government agencies to construct their own private networks, such as computer networks within a school, and to obtain telecommunication services from other vendors, such as Teleport.⁴⁹

The use of alternative telecommunication suppliers caused understandable concern among the local telephone companies. These companies perceived plain-old-telephone service as a slow growing industry, and, in order to sustain and increase profit growth, they wanted to be major players in the potentially rapidly growing provision of information age services.⁵⁰ Just as AT&T had responded to competition after 1893 by accelerating the redesign of its network, the exchange companies in the late 1970s concluded that rapidly replacing their analog network with a digital network was the "key" to future success in the emerging information service markets.⁵¹

The digital network helps local telephone companies market high-speed data services, which may bring firms that transmit large volumes of data back onto the network used for plain-old-telephone service.⁵²

49. See *Re Pacific Bell*, 69 Pub. Util. Rep. 4th (PUR) 225, 236 (1985); Griffiths, *ISDN Network Terminating Equipment*, 30 IEEE TRANSACTION ON COMM. 2137 (1982); Noam, *The Public Telecommunications Network: A Concept in Transition*, 37 J. COMM. 30 (1987); Noll, *The Future of Telecommunications Regulation*, in TELECOMMUNICATIONS REG. TODAY AND TOMORROW 41, 43 (E. Noam ed. 1983); Raster, Wong & Goldmann, *The Bypass Issue: An Emerging Form of Competition in the Telephone Industry*, 1984 NAT'L REGULATORY RES. INST. 17.

50. Lehr & Noll, *ISDN and the Small User: Regulatory Policy Issues* (Columbia U. Center for Telecommunications and Information Studies 1989); Remarks of James Vogt, President, Lynch Communications Systems, EIA Symposium (May 30, 1985).

51. "The recent trend of increasing demand for nonvoice telecommunication services is causing an evolution from the existing analog telephony network to the new digital network—integrated services digital network (ISDN)—which integrates various voice and nonvoice services by means of digital technologies." Ogiwara & Terada, *Design Philosophy and Hardware Implementation for Digital Subscriber Loops*, 30 IEEE TRANSACTIONS ON COMM. 2057 (1982). Ogiwara and Terada add that "[t]he digital subscriber loop is the key technology to achieve end-to-end digital connection in the ISDN." *Id.*

The digitalization of the network requires the replacement of analog with digital switching machines, and the re-engineering of the loops that connect customers to the switching machines. See Amon, *supra* note 45, at 55; Byrne, *supra* note 45, at 2006–10; Giesken, *supra* note 45, at 19–28; Handler & Sheinbein, *supra* note 45, at 1–3.

52. With the use of digital switching and processor control for telephony, it is obvious that this could also offer high bit-rate switched access for nonvoice services. If such a network is provided for suitable facilities, the trend towards a large number of separate networks for different services could be reversed and a single integrated services digital network (ISDN) would be used for all voice and nonvoice services.

Moreover, through the future deployment of fiber optic technology that extends from the switch at the local telephone company to the customers' location, the local telephone companies will be able to provide video and high-speed data services at a low incremental cost, further inducing big businesses back onto the plain-old-telephone network.

As these new services become profitable, the possibility of self-dealing by the local telephone companies increases. The next sections discuss how ratepayers have sponsored recent changes in the telecommunications infrastructure, and how this process has established an opportunity for self-dealing. Through the regulatory capital recovery process, customers of plain-old-telephone service have provided billions of dollars to modernize the network for high-speed data and video services. Under current regulatory procedures, these customers will likely be denied the opportunity to share the gains of the emerging information services.

B. The Impact of Technological Change on Depreciation Expenses and the Depreciation Reserve

The low incremental cost of usage on an optic or digital network is not achieved without substantial capital cost.⁵³ As with the introduction of the metallic loop technology one hundred years ago, fiber-optics in the local loop will increase the fixed cost of serving customers. The capital cost of re-engineering the network for these new services has been estimated at approximately \$2000 per subscriber or \$200 billion in capital costs for the nation.⁵⁴ The comparable book investment per existing copper line is approximately \$600 per subscriber,⁵⁵ with a near-zero incremental capital cost.

Exchange companies investing in these new technologies have had little need to turn to external capital markets.⁵⁶ Since 1981, these

PROC. 1982 INT'L SYMP. ON SUBSCRIBER LOOPS AND SERVICES 14, 15 (1982).

53. See Schmidt, *Integration of Services on the Digital Subscriber Loop-Changes and Restrictions*, in PROC. 1982 INT'L SYMP. ON SUBSCRIBER LOOPS AND SERVICES 20, 21-22 (1982).

54. Sirbu, Ferrante & Reed, *An Engineering and Policy Analysis of Fiber Introduction into the Residential Subscriber Loop* (Carnegie Mellon U. Dept. of Engineering and Public Policy Working Paper, Sept. 1988). The \$2000 incremental capital cost does not include the additional switching investment. No data is available for this part of the network because the technology is currently being developed.

55. In 1984, the investment was \$614 per customer line. NATIONAL EXCHANGE CARRIER ASSOCIATION, RATE DEVELOPMENT AND COST ANALYSIS UNIVERSAL SERVICE FUND ANALYSIS OF OPERATIONS, tab 1 at 2, tab 11 at 15 (Aug. 6, 1984).

56. Egan, *Phone Companies Are Businesses Too* (Columbia U. Center for Telecommunications and Information Studies, 1988); *In re Amortization of Depreciation Reserve Imbalances of Local Exchange Carriers*, 3 FCC Rcd. 984, 993 (1988) (Dennis dissenting).

companies have been able to rely on internal cash flow largely because state and federal regulatory bodies have approved higher depreciation expense rates.⁵⁷ Higher depreciation expenses raise the regulated price of service in the short-run and increase a local telephone company's internal cash flow.

The composite annual depreciation rates of telephone companies has increased from 5.1% to 7.4% between 1975 and 1986.⁵⁸ Both technological change and the local telephone companies' desire to provide new services have led state and federal regulatory bodies to approve increased depreciation rates. Just as AT&T believed at the turn of the century that providing toll and exchange services through separate networks was not economical, today the exchange companies believe that integrating existing products with new ones will lower the total cost of providing telecommunication services. The following passage from Michigan Bell Telephone's 1983 Depreciation Report to the Federal Communications Commission ("FCC") illustrates the factors the firm believes are forcing it to increase its depreciation rates:

The ability to switch high speed data at a variety of speeds is essential. Processor retrofits and generic updates will only provide intermediate relief to the growing network demand. In the short term, use of multiple systems to perform additional switching functions like video, seems reasonable. But as demand on the network expands, the multiple switch concept will become too expensive to maintain. Instead of having three switching units in a central office, one for POTS (Plain Old Telephone Service), another for data and a third for video, it will be more economical to place a multiple purpose switch.⁵⁹

Currently Michigan Bell, and other local exchange companies, are providing high-speed data, video, and basic telephone services through separate networks. These suppliers are accelerating the retirement of

57. The Supreme Court recently defined depreciation "as the loss in service value of a capital asset over time. In the context of public utility accounting and regulation, it is a process of charging the cost of depreciable property, adjusted for net salvage, to operating expense accounts over the useful life of the asset." *Louisiana Public Service Comm'n. v. Fed. Comm. Comm'n.*, 476 U.S. 355, 364 (1986).

58. National Association of Regulatory and Utility Commissioners Capital Recovery Task Force 2-3 (Feb. 1, 1988). Depreciation is the local exchange companies' largest operating expense. See FEDERAL COMMUNICATIONS COMMISSION, STATISTICS OF COMMUNICATION COMMON CARRIERS, Table 14 at 23 (1986).

59. MICHIGAN BELL TELEPHONE, DEPRECIATION REPORT TO THE FEDERAL COMMUNICATIONS COMMISSION 6 (Oct. 1982).

existing facilities because they believe their long-run profits will increase if all three types of products are provided through one network. Moreover, local telephone companies hope that the integration of video and high-speed data with existing services will generate demand complementarities, in much the same way that AT&T believed that the demand for long-distance service would increase if long-distance service was integrated with exchange service. Since more customers can be reached through the public network than through private data and video networks, demand for voice and high-speed data services may be stimulated by integrating these services onto one network. The more customers that can be reached on the network, the greater the value of the service to subscribers. As the value of high-speed data and video services increases for a given price, more customers will subscribe to and use these services.⁶⁰

The deployment of a multiple purpose switch raises the price of standard telephone service in the short-run because the retirement date of existing equipment is advanced. In the short-run, few customers will obtain video and high-speed data services from the telephone company. Therefore, from an accounting perspective, the short-run incremental expense from the deployment of the new technology exceeds the incremental revenue, thus increasing the expenses that must be covered by regulated, basic services.

The increased price of telephone services is due to the installation of new technology that is not fully utilized at first. The price is also higher in the short-run because the regulated local exchange companies are allowed to recover the cost of older equipment that may be retired due to the construction of the digital network. The early retirement of facilities may lead to a depreciation short-fall on the books of the regulated firm. When such a short-fall exists, the local exchange company may be allowed to increase its prices in order to eliminate this deficiency. Authorized regulatory depreciation rates, beginning in the late 1960s, were too low because the state and federal regulatory commissions did not adequately anticipate rapid technological progress, growth in the demand for information services, and changes in the market structure.⁶¹ The depreciation rates were based on incorrect assumptions about the economic life of the facilities.

60. For a discussion of the process of creating a critical mass for new telecommunication services, see Allen, *New Telecommunications Services: Network Externalities and Critical Mass*, 12 TELECOMMUNICATIONS POL'Y 257-71 (1988); Fullerton, *Rejoinder*, 13 TELECOMMUNICATIONS POL'Y 167-68 (1989); Noll, *supra* note 49.

61. *Louisiana v. FCC*, 476 U.S. at 358-59; 2 FCC Rcd. 6473, 6474 (1987); 3 FCC Rcd. 984 (1988).

Starting in the mid-1970s, the local telephone companies concluded that the book value of their plant exceeded the economic value of their plant. In order to represent correctly the financial status of the firm⁶² and to improve their market position,⁶³ the local telephone companies requested accelerated depreciation of existing investments. State and federal regulatory commissions found that ratepayers were legally obligated to compensate the local telephone companies for the decline in the value of the local telephone companies' assets arising from unanticipated technological change.⁶⁴

Each year, depreciation expenses are booked to reflect the decline in the value of assets. Corresponding to these depreciation charges are credits that are entered in the utility's depreciation reserve account. To determine the utility's rate base—the portion of investment from which a firm is allowed to earn a profit—the accumulated credits are deducted from the original cost of the facilities in service. The firm's "rate base is reduced according to a depreciation schedule that is based on an estimate of the item's expected useful life."⁶⁵ For example, assuming no capital improvements, a depreciable asset with an original cost of \$10,000, a salvage value of \$500, and a lifetime of ten years is given a depreciation rate of ten per cent and is depreciated at the rate of \$950 per year over its ten-year life. At the end of two years, the amount of this asset included in the rate base would be \$8100. When assumptions about the useful life of an asset are incorrect, a mismatch occurs between the asset's book and market value. In the above example, if the correct service life of the plant turned out to be four years, rather than ten, there would be a reserve deficiency⁶⁶ of \$2850 at the end of the second year that the plant

62. Property Depreciation, 83 F.C.C.2d 267, 270 (1980); Amortization of the Depreciation Reserve Imbalance of Local Exchange Carriers, 2 FCC Rcd. 6473, 6474 (1987).

63. *In re Northwestern Bell Tel. Co.*, State of Iowa Dept. of Commerce: Utilities Div., RPU-88-6, slip op. at 38-41 (1989).

64. See, e.g., Property Depreciation, 83 F.C.C.2d 267, 276 (1980), *recon.* 87 F.C.C.2d 916 (1981); *Re Northwestern Bell Tel. Co.*, 94 Pub. Util. Rep. 4th (PUR) 132, 137 (1988). See also *Re Southern Bell Tel. & Tel. Co.*, 82 Pub. Util. Rep. 4th (PUR) 682, 684 (1987); *Re New York Tel. Co.*, 77 Pub. Util. Rep. 4th (PUR) 119, 129 (1986); *Re New England Tel. & Tel. Co.*, 63 Pub. Util. Rep. 4th (PUR) 356, 361 (1985).

65. *Louisiana v. FCC*, 476 U.S. at 365.

66. The Michigan Public Service Commission has defined the depreciation reserve deficiency as "the difference between that depreciation reserve maintained on the company's books and that which would have been accrued had the actual service lives and salvage values been known at the time the asset was placed into service." *Re Michigan Bell Tel. Co.*, 77 Pub. Util. Rep. 4th (PUR) 535, 537 (1986).

67. With an actual service life of four years, the depreciation rate should have been \$2375 per year. A yearly depreciation deficiency of \$1425 results since the depreciation rate was only \$950 because the service life was expected to be ten years. In two years, the total deficiency would be \$2850 ($(\$2375 - 950) \times 2$). This example assumes that the regulatory body has adopted remaining life accounting procedures. For a description of the whole life versus remaining life methods, see *Louisiana v. FCC*, 476 U.S. at 360-61.

was in service.⁶⁷ Due largely to technological change,⁶⁸ growing markets, changes in market structure, and a reduction in regulatory barriers-to-entry,⁶⁹ the service life of telecommunications equipment has been reduced in the past decade.⁷⁰ The lower service life increases a utility's annual depreciation expenses, and leads to higher prices, at least in the short-run.⁷¹

C. Judicial and Regulatory Standards in the Era of Embedded-Cost Rate-Making

As noted above, shortened service life of equipment raises a utility's annual depreciation expense. This increased expense has traditionally been reflected in customer rates. Participants in regulatory hearings have accepted that rate-payers are obligated to increase their payments in order to eliminate the depreciation reserve deficiency. Argument has primarily focused on the timing of the depreciation of assets. The FCC established the boundaries of debate in 1981 stating:

68. *Re Southern Bell Tel. & Tel. Co.*, 82 Pub. Util. Rep. 4th (PUR) 682, 684-85 (1987); *Re New York Tel. Co.*, 77 Pub. Util. Rep. 4th (PUR) 119, 129 (1986); *Amortization of Depreciation Reserve Imbalances of Local Exchange Carriers*, 3 FCC Rcd. 984, 986 (1988).

69. *Re New England Tel. & Tel. Co.*, 63 Pub. Util. Rep. 4th (PUR) 356, 361 (1985); *Re Pacific Bell*, 69 Pub. Util. Rep. 4th (PUR) 225, 234-36, 259 (1985); Brief amicus curiae of the United States Tel. Ass'n at 7-8, *Louisiana v. FCC*, 476 U.S. 355.

70. *Re Northwestern Bell Tel. Co.*, 91 Pub. Util. Rep. 4th (PUR) 52, 55, 57 (1988); *Amortization of the Depreciation Reserve Imbalance of Local Exchange Companies*, 2 FCC Rcd. 6473, 6474 (1987).

71. *Re Southwestern Bell Tel. Co.*, 77 Pub. Util. Rep. 4th (PUR) 358, 360 (1986); *Re Mountain States Tel. & Tel. Co.*, 76 Pub. Util. Rep. 4th (PUR) 667 (1986); *Re Wisconsin Bell, Inc.*, 77 Pub. Util. Rep. 4th (PUR) 138 (1986); *Amortization of the Depreciation Reserve Imbalance of Local Exchange Companies*, 2 FCC Rcd. 6473, 6475 (1987). Accelerated depreciation may lead to lower rates in the long-run because of: (i) the reduced rate base; (ii) the potential maintenance savings associated with the introduction of new equipment that is financed in part through accelerated depreciation; and (iii) lower capital costs due to less investment risk. *See Re General Tel. Co. of the Northwest, Inc.*, 78 Pub. Util. Rep. 4th (PUR) 576, 579 (1987); *Re Continental Tel. Co.*, 81 Pub. Util. Rep. 4th (PUR) 153, 155-56 (1987); *Re Northwestern Bell Tel. Co.*, 91 Pub. Util. Rep. 4th (PUR) 52, 54 (1988).

At this early juncture, the new digital switches being installed by the local exchange companies appear to be more costly to maintain than the existing analog electronic switching machines. *See New England Telephone, Massachusetts Incremental Cost Study*, Mass. Dept. of Public Utilities docket 86-33, book one, tab 2, at 4 (Apr. 1986). It may be that maintenance practices for digital central office equipment are still in the "learning" phase, and reductions may occur in the future.

[I]t is settled law that capital prudently invested in a regulated public utility must be recovered through annual charges to depreciation expense. The depreciation process spreads this recovery over the average estimated service life of the various plant categories in such a way as to provide full capital recovery. The only question addressed in this proceeding is the speed at which this recovery will occur, i.e. the allocation of the cost among present ratepayers and future ratepayers.⁷²

The depreciation reserve deficiencies resulting from the shortened service life of equipment must be paid for by current and future ratepayers. Stockholders do not bear any of the loss from the unanticipated technological change. The cumulative reserve deficiency in the telecommunications industry was estimated to be as high as twenty-six billion dollars in 1986.⁷³ The FCC has estimated that approximately seventy-six percent of the deficiency will be eliminated by 1990.⁷⁴

Having the ratepayers bear the cost of unanticipated changes in the market suggests that regulatory bodies are not using competitive market theory as a guide for depreciation policy. If the market were competitive, when the book value of a firm's assets exceeds its market value, the excess capitalization would be written off as a stockholder loss.⁷⁵

The failure of regulatory commissions to approve the telephone utilities' earlier requests for a higher depreciation rate does not justify requiring consumers to pay higher recovery rates due to technological change. If, prior to this era of rapid technological change, the telephone utilities believed that the depreciation rates authorized by the regulatory commissions were too low, and therefore authorized prices did not cover the full cost of service, the firms could have sought court relief. If rates fail to recover the cost of service, they are confiscatory and therefore violate the firm's Fifth and Fourteenth Amendment rights under the Constitu-

72. Property Depreciation, 87 F.C.C.2d 916, 918 (1981). See also Amortization of Depreciation Reserve Imbalances of Local Exchange Carriers, 3 FCC Rcd. 984 (1988). Most states have adopted a similar policy. See, e.g., *Re New England Tel. and Tel. Co.*, 71 Pub. Util. Rep. 4th (PUR) 652, 661 (1986); *Re Pacific Bell*, 69 Pub. Util. Rep. 4th (PUR) 225, 265 (1985); *Re Northwestern Bell Tel. Co.*, 91 Pub. Util. Rep. 4th (PUR) 52, 54 (1988).

73. *Louisiana v. FCC*, 476 U.S. at 359.

74. Amortization of Depreciation Reserve Imbalances of Local Exchange Carriers, 3 FCC Rcd. 984 (1988).

75. For example, AT&T "wrote off \$6.7 billion worth of obsolete equipment" in 1988. DiMaria, *AT&T's Time May Have Come*, N.Y. Times, Mar. 15, 1989, at D6, col. 2.

tion.⁷⁶ The regulatory commissions should not bear exclusive blame ex post, since court relief was either not sought by the firms or not provided by the courts.

Even if the state and federal regulatory commission had ignored the telephone utilities' request for higher depreciation rates, current customers should not pay for the mistake of a government agency. Addressing this issue, the Iowa Utilities Board concluded that

[e]ven if *all* of the responsibility for inadequate depreciation could be attributed to the FCC and the Board, which is a disputed premise in these proceedings . . . the placement of blame on the regulators would not be relevant to the task the Board faces. Additional costs must be paid and neither the Board nor the FCC will pay them. Under the hypothetical premise of total blame on regulators, the Board still would have to apportion the resulting costs between totally blameless shareholders and totally blameless current and future ratepayers.⁷⁷

In the end, the Iowa Utilities Board, like all other state commissions,⁷⁸ followed the lead of the FCC in holding the customers financially liable for the losses of unexpected technological change. The FCC, citing *Democratic Central Committee of the District of Columbia v. Washington Metropolitan Area Transit Commission*,⁷⁹ concluded in 1980 that stockholders are entitled to full reimbursement of "prudently invested" capital regardless of changes in technology.⁸⁰

In *Democratic Central Committee*, the Court of Appeals for the District of Columbia examined whether a utility or its customers were

76. Federal Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591 (1944).

77. *Re Northwestern Bell Tel. Co.*, 94 Pub. Util. Rep. 4th (PUR) 132, 135 (1988). The Board added that it was unanticipated technological progress, not government error, that was responsible for the reduction of the value of the firm's assets. *Id.* at 137.

If the regulatory commission were an agent for ratepayers, it would be appropriate to have customers pay for the mistakes of their agent. But this is not the case. Regulatory bodies hear contested cases where interested parties, including customers, present their affirmative case. The government agency, after considering the evidence presented, sets "'just and reasonable' rates" that "balance . . . the investor and the consumer interests." Federal Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).

78. *See, e.g., Re Northwestern Bell Tel. Co.*, 94 Pub. Util. Rep. 4th (PUR) 132, 137 (1988); *Re Southern Bell Tel. & Tel. Co.*, 82 Pub. Util. Rep. 4th (PUR) 682, 685 (1987); *Re New York Tel. Co.*, 77 Pub. Util. Rep. 4th (PUR) 119, 129 (1986); *Re New England Tel. & Tel. Co.*, 63 Pub. Util. Rep. 4th (PUR) 356, 361 (1985); *Re Pacific Bell*, 69 Pub. Util. Rep. 4th (PUR) 225, 228 (1985).

79. 485 F.2d 786 (D.C. Cir. 1973), *cert. denied*, 415 U.S. 935 (1974).

80. *Property Depreciation*, 83 F.C.C.2d 267, 276 (1980), *recon.* 87 F.C.C.2d 916 (1981).

entitled to the capital gains obtained from property recently sold. The court contended that the issue should be resolved by evaluating the procedures used to establish rates, and what the rate-setting process suggested about the contractual relationship between customers and stockholders. When utility regulation began, most rate-making was based on the fair value of a utility's property. Fair value was determined by calculating the market value or replacement cost of the supplier's assets.⁸¹ Stockholders were afforded the opportunity to earn a rate-of-return on a rate base that reflected the current value of the assets. If the assets grew in value because of inflation or some other market change, the rate base and rates increased.⁸²

In 1933, which was during an era of economic depression and declining prices, the Supreme Court held that it was not necessary to use replacement costs to determine the value of the rate base.⁸³ In its 1944 decision in *Federal Power Commission v. Hope Natural Gas*,⁸⁴ the Supreme Court held that the Federal Power Commission did not have to base rates on the fair value of assets. Subsequently, state and federal regulatory commissions have almost exclusively used book investment to calculate the rate base.⁸⁵

If the rate base valuation is based on the book value of a firm's assets, the utility may not increase its rates if the market value of the assets increases. Since the telephone utilities are denied the opportunity to earn these capital gains, courts and commissions have generally found that consumers should bear the risk of premature obsolescence of equipment: "The risk of loss from premature retirement of assets because of obsolescence, as a general rule . . . falls on consumers."⁸⁶

81. *Democratic Central Committee*, 485 F.2d at 800-01; I. A. KAHN, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS* 37-38 (1988).

82. The regulatory process was not symmetrical. Market changes that led to a reduction in the cost of service did not necessarily lead to a lowering of rates. Under the reproduction cost methodology, if technological change lowered the value of the assets, the rate base could be reduced. But the Supreme Court was reluctant to pass on to customers all of the benefits associated with technological change. In *Pacific Gas Co. v. San Francisco*, 265 U.S. 403 (1923), the Court held that it was improper for the city to lower gas rates when the utility adopted cost-saving technologies. The Court noted that if the adoption of new production techniques led to lower rates which did not provide for the cost of premature obsolescence of earlier equipment, "successful efforts to improve the service will prove extremely disadvantageous." *Id.* at 416.

83. *Los Angeles Gas & Electric Co. v. Railroad Comm'n of California*, 289 U.S. 287 (1933).

84. 320 U.S. 591 (1944).

85. *Democratic Central Committee*, 485 F.2d at 801-02; A. KAHN, *supra* note 81, at 40-41.

86. *Democratic Central Committee*, 485 F.2d at 807. See also *Property Depreciation*, 83 F.C.C.2d 267, 276 (1980). If the assets are not "used and useful," the investment may be excluded from the rate base. The Pennsylvania and Indiana Supreme Courts recently held that if a nuclear plant is not operating, regardless of how prudent the investment initially

Under the current system of setting rates based on embedded investment, stockholders earn a return on the capital invested, while consumers realize gains or losses from asset value fluctuations.⁸⁷ The court held in *Democratic Central Committee* that what has prevailed since the demise of fair value rate making "is the central idea that the investor's legally protected interest resides in the capital he invests in the utility rather than in the items of property which that capital purchases for provision of utility service."⁸⁸

Concurrent with the demise of the fair value theory of rate making, the risk associated with fluctuations in the value of the assets has been transferred from the stockholders to the ratepayers. This reallocation of risk has served as the legal basis for requiring consumers to pay for the losses from recent technological change.

While technological change destroys the value of current capital, it also creates new economic opportunities. Organization theory suggests that since customers have borne some of "the risk of the difference between stochastic inflows of resources and promised payments to agents," they are "residual claimants" on the gains associated with tech-

may have been, the investment may be excluded from the rate base. The Pennsylvania Court disallowed the inclusion of investment associated with the Three Mile Island Nuclear Plant because the facility was inoperable. *Metropolitan Edison Co. v. Pennsylvania Public Util. Comm'n.*, 502 A.2d 130, 135-36 (Pa. 1985), *cert. denied*, 476 U.S. 1137 (1986). The Indiana Court held that since an abandoned reactor had never been placed in service, consumers should not bear the cost of a facility that was no longer economical. *Citizens Action Coalition of Indiana v. Northern Indiana Public Service Co.*, 485 N.E.2d 610, 615 (Ind. 1985), *cert. denied*, 476 U.S. 1137 (1986). The Indiana Court qualified its decision by pointing out that if the nuclear plant had been placed in service, and subsequently taken out of service, it might have reached a different conclusion. If the plant had been placed in service, this may be sufficient evidence of being a "used and useful" investment. *Id.* at 616. While this case law suggests that commissions are not obligated to have consumers pay higher rates that will allow the telephone companies to recover their depreciation shortfall, commissions have generally allowed utilities to raise their rates nevertheless.

87. *Democratic Central Committee*, 485 F.2d at 806-07; *Property Depreciation*, 83 F.C.C.2d 267, 276 (1980). During the settlement of *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd sub. nom. Maryland v. United States* 460 U.S. 1001 (1983), state regulatory commissions submitted their views on the division of assets to the court. The commissions, citing *Democratic Central Committee*, argued that the value of the assets transferred from the Bell operating companies to AT&T should be based on the net book value of the property. The presiding judge in the antitrust case, Harold Greene, pointed out that in *Democratic Central Committee* the assets were being removed from the regulated activities of the utility and therefore the court had to decide "to whom the benefit of that gain should inure." 485 F.2d at 806. Judge Greene found in *United States v. AT&T* that no such separation would occur as a result of divestiture; some assets would be transferred from the Bell operating companies to AT&T, but they would continue to be used for regulated services. 552 F. Supp. at 131.

88. *Democratic Central Committee*, 485 F.2d at 801.

nological change.⁸⁹ Using Judge Dever's allocation method from *Read v. Central Union*, this would mean apportioning the costs of re-engineering the network between existing and new data and video services "upon a fair and equitable basis, having regard to the benefits resulting to the [parties] respectively from the expenditures made for their joint benefit."⁹⁰ Alternatively, the profits generated by these new services could be partly credited to customers of plain-old-telephone service as compensation for providing funds for new technologies.

Recent regulatory developments suggest that ratepayers may not receive their equitable share of the benefits associated with technological change. As discussed above, local exchange companies have reconstructed, or are in the process of reconstructing, their networks in a fashion that improves their competitive position to provide video and high-speed data services. After the demand for the new products has risen sufficiently and the product is profitable, the local exchange companies may then argue that the services need not be regulated as they are not "essential" and close substitutes exist in the market.⁹¹

If these new services were spun-off from the regulated operations of the local exchange companies,⁹² are the subscribers of existing, basic

89. Fama & Jensen, *Agency Problems and Residual Claims*, 26 J. LAW & ECON. 327, 328 (1983).

90. *Read v. Central Union* (Final Decree), slip op. at 38.

91. These two criteria, that the product is essential and no effective competition exists, are often considered necessary conditions for there to be an economic case for imposing regulation. See, e.g., National Telecommunications and Information Administration, U.S. Dept. of Commerce, NTIA Regulatory Alternatives Report 52-53 (1987).

92. During the past ten years, it has increasingly become a regulatory practice to deregulate new and enhanced services. Even though these new services may share the same facilities as regulated services, they are treated as a product provided by a nonregulated subsidiary. The division of costs between the regulated and nonregulated subsidiary is often based on relative use, or the short-run incremental cost of using common facilities. These methods do not take into account the cost impact of upgrading the network for the new service. The approach is similar in concept to the excess cost test adopted by AT&T when it introduced long-distance telephone service.

For a discussion of the mechanics of the relative-use procedure, as adopted by the FCC, see Separation of Costs of Regulated Telephone Service From Costs of Nonregulated Activities, CC Docket No. 86-111, Report and Order, 2 FCC Rcd. 1298 (1987), *modified on reconsideration*, 2 FCC Rcd. 6283 (1987), *modified on further reconsideration*, 3 FCC Rcd. 6701 (1988), *petition for review pending*, *Southwestern Bell Corp. v. FCC* (D.C.Cir. Dec. 14, 1987) (No. 87-1764).

Only 36% of the state utility commissions have established, or are in the process of establishing, standards for separating costs between regulated and nonregulated activities. See Mark Jamison, Staff Member of the Iowa Utilities Board, Memorandum to the National Association of Regulatory and Utility Commissioners' Communications Committee Members (May 26, 1988). Where standards have been established for competitive, regulated services, the state commissions have largely adopted incremental costs as the appropriate cost standard for rate setting. 6 State Telephone Regulation Report 1, 3-6 (Dec. 1, 1988).

telephone services entitled to the same protection as the minority stockholders of Central Union? Should they be allowed to share the gains associated with the new services during the mature stage of the product cycle?⁹³ Alternatively, should the telephone utilities be prohibited from spinning off profitable operations to unregulated subsidiaries? In short, what type of property-rights claims do customers have when they are served by a regulated utility?

The relationship between telephone utilities and their customers has changed over time due to changes in relative prices, technology, regulatory and legislative policy, and judicial interpretation of the law.⁹⁴ In part, the evolving relationship is an outgrowth of the absence of any clear definition of the objectives in the enabling legislation of regulatory commissions.⁹⁵ Both legal and economic literature state a number of well-defined regulatory goals,⁹⁶ such as emulating competitive market behavior,⁹⁷ protecting monopoly rate payers,⁹⁸ aiding the development of the nation's infrastructure,⁹⁹ providing telephone utilities the opportunity to earn a rate-of-return that is "commensurate" with earnings in fields with similar risk,¹⁰⁰ and establishing market order in an industry that is

93. This issue is raised by the National Association of Regulatory Utility Commissioners: "If funds are provided through the utility, especially if provided by the ratepayers, ratepayers may want a share of the diversified earnings." NATIONAL ASS'N OF REGULATORY UTIL. COMM'RS, 1982 REPORT OF THE AD HOC COMM. ON UTIL. DIVERSIFICATION 18, quoted in Knapp, *Effective State Regulation of Energy Utility Diversification*, 136 U. PA. L. REV. 1677, 1690 n. 56 (1988).

94. *Democratic Central Committee*, 485 F.2d at 786; McConnell, *Public Utilities' Private Rights: Paying for Failed Nuclear Power Projects*, REGULATION, 1988 No. 2, at 35.

95. See T. McCRAW, *PROPHETS OF REGULATION: CHARLES FRANCIS ADAMS, LOUIS D. BRANDEIS, JAMES M. LANDIS, AND ALFRED E. KAHN* 19 (1984).

96. See Jones, *Regulatory Concepts, Propositions, and Doctrines: Casualties and Survivors*, 22 J. ECON. ISSUES 1089 (1988).

97. *Citizens Action Coalition of Indiana v. Northern Indiana Public Service Co.*, 4721 N.E.2d 938 (1984), cert. denied, 476 U.S. 1137 (1986); C. PHILLIPS, *THE ECONOMICS OF REGULATION: THEORY AND PRACTICE IN THE TRANSPORTATION AND PUBLIC UTILITY INDUSTRIES* 19 (1965). Posner, on the other hand, argues that "[t]he existence of the internal subsidy (e.g. free communication channels to educational television channels) is an embarrassment to proponents of the . . . view that regulation is imposed in order to bring about results approximating those of competition. . . . [T]he internal subsidy brings about results unthinkable in a competitive market. . . ." Posner, *Taxation by Regulation*, 2 BELL J. ECON. & MGMT. SCI. 27 (1971).

98. M. GLAESER, *PUBLIC UTILITIES IN AMERICAN CAPITALISM* 196-97 (1957); C. PHILLIPS, *supra* note 97, at 28-31, 41; Knapp, *supra* note 93, at 1685.

99. *Property Depreciation*, 83 F.C.C.2d 267, 281 (1980), reconsidered 87 F.C.C.2d 916, 918 (1981); *Re General Telephone*, 86 Pub. Util. Rep. 4th (PUR) 626, 652 (1987).

100. *Federal Power Comm'n. v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944); 2 A. PRIEST, *PRINCIPLES OF PUBLIC UTILITY REGULATION* 788-89 (1969) (quoting *Missouri ex rel. Southwestern Bell Tel. Co. v. Public Serv. Comm'n.*, 262 U.S. 276, 290-91 (1923) (Brandeis concurring)).

otherwise subject to ruinous competition.¹⁰¹ These regulatory targets often suggest conflicting courses of action. For example, rate base treatment of assets that is consistent with competitive market behavior may endanger the financial health of the utility;¹⁰² and higher telecommunication prices that aid the development of the nation's infrastructure by increasing a firm's internal cash flow may be injurious to monopoly rate payers.¹⁰³ The Supreme Court summarized the regulatory dilemma in the *Permain Basin Area Rate Cases*¹⁰⁴ when it stated that "neither law nor economics has yet devised generally accepted standards for the evaluation of rate-making orders."¹⁰⁵

During the era of fair value rate making, the Supreme Court's position was that customers do not have a claim on the value of utility assets: "The relation between the company and its customers is not that of partners, agent and principal, or trustee and beneficiary."¹⁰⁶ The Court added that "[c]ustomers pay for service, not for the property used to render it . . . [b]y paying bills for service they do not acquire any interest, legal or equitable, in the property used for the convenience or in the funds of the company."¹⁰⁷ The substitution of embedded cost for fair value of assets changed this relation. Ratepayers are now seen as having a claim on the change in the value of assets because they are in a sense stockholders.¹⁰⁸

In the classical model of the firm, the firm's assets remain the exclusive property of those who have supplied financial capital. The relevance of the classical model is currently being debated. For example, labor often makes risky commitments to a firm. Labor may make firm-specific investments in the sense of increased human capital that is valued most highly by its current employer. One commentator has noted:

101. G. BROWN, *THE GAS LIGHT COMPANY OF BALTIMORE: A STUDY OF NATURAL MONOPOLY* 243 (1936); Posner, *Natural Monopoly and its Regulation*, 21 *STAN. L. REV.* 548, 585 (1969).

102. *Metropolitan Edison Co. v. Pennsylvania Pub. Util. Comm'n.*, 502 A.2d 130, 135-36 (1985), *cert. denied*, 476 U.S. 1137 (1986).

103. *Re New England Tel. and Tel. Co.*, 71 *Pub. Util. Rep.* 4th (PUR) 652, 658 (1985); *Virginia State Corp. Comm'n. v. Fed. Comm. Comm'n.*, 737 F.2d 388, 399 (1984) (Widener J., dissenting).

104. 390 U.S. 747 (1968).

105. *Id.* at 790. For a more recent discussion, see T. McCRAW, *supra* note 95, at 301.

106. *Board of Pub. Util. Comm'rs. v. New York Tel. Co.*, 271 U.S. 23, 31 (1926).

107. *Id.*

108. *Democratic Central Committee*, 485 F.2d at 801; *Property Depreciation*, 83 F.C.C.2d 267, 276 (1980).

Objectively viewed, labor's investment in the firm can be understood as a vital input; the capital in question represents nothing less than one part of the total capital stock needed by the firm for production. In effect 'joint investment' takes place, and workers, just as conventional stockholders, contribute to the firm's total capital requirements. It is arguable, then, that *worker-investors should be regarded as equity holders*.¹⁰⁹

The customers of the utility who bear the risk associated with unanticipated technological change, through increased depreciation rates, are not protected from majority self-dealing to the same degree that the court afforded protection to the minority stockholders of Central Union. As new, information age services become profitable, the local exchange companies may decide to spin-off these services to a non-regulated subsidiary of the company.¹¹⁰ When services are spun-off from the regulated entity, the payment to the regulated entity for shared facilities frequently reflects the direct or incremental cost of service.

The use of incremental costs is arguably consistent with static, neo-classical economic theory and antitrust law.¹¹¹ Nevertheless, this method does not take into account the costs incurred by existing customers in sponsoring new services. First, as already described, some of the funds for the new technology that make new services potentially profitable are often obtained through the depreciation process from ratepayers.¹¹² Second, the introduction of new technology raises the fixed cost of production and lowers the marginal cost. For example, the fixed cost of serving a customer on a fiber optic loop is higher than the cost on the prior generation of copper loops. The higher fixed cost leads to an

109. Furuboth, *Codetermination and the Modern Theory of the Firm: A Property-Rights Analysis*, 61 J. BUS. 165, 168 (1988) (emphasis added).

110. It has recently been argued that officers of the regulated utility often make decisions regarding intra-holding company transactions that are in the best interest of the holding company, rather than the utility. See NAT'L ASS'N OF REGULATORY UTIL. COMM'N. REPORT OF THE AD HOC COMMITTEE ON UTILITY DIVERSIFICATION 322 (1988).

111. S. BERG & J. TSCHIRHART, *NATURAL MONOPOLY REGULATION: PRINCIPLES AND PRACTICE* (1988); Siddall, *Antitrust Law—Predatory Pricing: A Ninth Circuit Wrinkle*, 12 J. CORP. LAW 765 (1987).

112. Western Union has argued before the FCC that since the amortization of the reserve deficiency reduced the need for the local exchange companies to obtain external financing, customers were contributing capital to the utility. The FCC rejected this argument. Since the investment was part of the utilities rate base, the only issue at hand was the "timing of recovery of costs." Amortization of Depreciation Reserve Imbalances of Local Exchange Carriers, 3 FCC Rcd. 984, 988 (1988) (emphasis in original). Western Union did not address the issue of spinning-off profitable new services.

increase in subscriber fixed monthly charges for basic service. Customers of plain-old-telephone service may therefore be paying for a technology for which they have little or no need.¹¹³ On the other hand, once this fixed customer cost is incurred, the marginal cost for usage is lower on a fiber network.

The incremental costing approach, which is currently used by telephone utilities in their rate proposals with commissions, assumes the state-of-the-art technology has already been deployed, that the increased fixed cost is recovered from all customers, and that the relevant incremental cost of usage for new services is the incremental cost on this new network.¹¹⁴ This method is the same as the incremental cost method found inequitable by Judge Dever in *Read v. Central Union*. When new services are spun-off to unregulated portions of the firm's corporate structure, the incremental cost method provides no compensation to existing customers for having sponsored the deployment of new technologies.

CONCLUSION

There are some notable parallels between the introduction of long-distance service in 1885 and the development of new information services today. In both cases, existing facilities were replaced with equipment that changed the cost structure of the industry—they raised the

113. Some economists have argued that because telephone facilities are used jointly by more than one service, it is economically inefficient to use the technical standards of the most demanding services to determine the cost of providing plain-old-telephone service. Instead, the recovery of the joint costs should be based on the different customer groups valuation of the jointly provided products. See Sickler, *A Theory of Telephone Rates*, 4 J. LAND & PUB. UTIL. ECON. 177 (1928); Melody, *Cost Standards for Judging Local Exchange Rates*, in *DIVERSIFICATION, DEREGULATION AND INCREASED UNCERTAINTY IN THE PUBLIC UTILITY INDUSTRIES* 474-95 (H. Trebing ed. 1983). See also Spence, *Monopoly, Quality and Regulation*, 6 BELL J. ECON. 417-29 (1975); *Re General Telephone*, 86 Pub. Util. Rep. 4th (PUR) 626, 651 (1987); Lehr & Noll, *ISDN and the Small User: Regulatory Policy Issues*, 1-2, 20 n.18, 41, 44 (Columbia U. Center for Telecommunications & Information Studies 1989). Lehr and Noll suggest that the deployment of the new technology, with its high-fixed and low-incremental cost structure, "is consistent with a strategy of uneconomic entry-foreclosing investments." *Id.* at 44.

114. Kahn & Shew, *Current Issues in Telecommunications Regulation: Pricing*, 4 YALE J. REG. 191, 219-21, 228 (1987). This approach has been accepted by some commissions. For example, the Massachusetts Department of Public Utilities stated that "we prefer that NET (New England Telephone) base its marginal cost estimates as closely as practicable on the costs of the network the Company actually plans to put into place, rather than a hypothetical POTS-type [plain-old-telephone service] network as proposed by the Attorney General." Massachusetts Department of Public Utilities, *Investigation into the Propriety of the Cost Studies Filed by New England Telephone*, DPU 86-33-G, slip op. at 418 (Mar. 21, 1989).

level and proportion of fixed costs. The higher fixed costs were recovered from existing services. In addition, the deployment of new technologies coincided with an expansion of the number of telecommunication suppliers. Finally, the use of incremental costing to allocate the cost of shared facilities raises questions of equity.

In both *Read v. Central Union* and *Democratic Central Committee*, the courts concluded that, as a matter of equity, "he who bears the financial burden of particular utility activity should also reap the benefit resulting therefrom."¹¹⁵ Concurrent with the demise of the fair value theory of rate-making, utility customers have been assigned privileges and responsibilities which previously were the domain of stockholders. In light of this change, customers should be afforded the same protection from self-dealing as provided to the plaintiffs in *Read v. Central Union*. Since regulatory agencies have required customers to cover the losses that are the byproduct of technological change, telephone utilities should not be allowed to spin-off successful new services unless appropriate compensation is provided.

Regulatory commissions need to consider what is the appropriate regulatory treatment of new, non-essential services. Judge Dever concluded in *Read v. Central Union* that using an incremental cost test to identify the costs associated with a new service does not provide adequate safeguards for the group that sponsors the products. In light of this decision, what cost standard should be used to identify the costs assigned to information age products that share facilities with existing telecommunication services? Should the methodology used to determine capital recovery be changed so that utility stockholders bear the loss associated with technological change? If this were done, they would be more fully entitled to the profits that may be realized from new products. Alternatively, should the telephone utilities be precluded from spinning-off successful new services since customers have borne a portion of the cost of the technological change that made these new services profitable?

The issues raised in this paper deal with equity during an era of rapid technological change. The telecommunications industry is a crucial part of the nation's infrastructure. Policies should be established that insure that the nation maintains its efficient, ubiquitous network. Dynamic objectives are not incompatible with equity. When new products reach the mature stage of their product cycle, regulators should insure that those who sponsored the new technology receive appropriate compensation.

115. *Democratic Central Committee*, 485 F.2d at 806. A similar conclusion was reached by Judge Dever in *Read v. Central Union* (Final Decree), slip op. at 104.