

COMMON CARRIER REGULATION—THE SILENT CRISIS

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INTRODUCTION

Government regulation in the field of common carrier communications has always been a subject of controversy. However, the adequacy and role of regulation have received increasing criticism in the last decade. The validity of this criticism insofar as the future is concerned will depend upon the flexibility and responsiveness of regulatory policies to changes that are transforming both the common carrier concept and the entire communications industry.

A recognition of this challenge is particularly important at the present time. Public policies which are adopted in response to the pressures for change will have profound consequences for the structure and performance of the communications industry in the 1970s and 1980s. Inaction, misplaced emphasis, and false assumptions will have far-reaching effects. Yet the current level of performance of the common carrier sector belies the magnitude of the issues and problems involved. Indeed, if the present availability of service to the general public through the voice and record networks were the only evidence of impending crisis, there would be little indication of the far-reaching decisions that must be made.

The pervasive forces influencing the future of the common carrier sector and the role of regulation stem from market growth and technological change in the postwar years. This pressure has eroded established market structures. It has developed new markets and created new options for supplying communications requirements. It has created a need to focus attention on the market structure dimension of regulatory policy as the possibility of new entrants appears with increasing frequency. Further, it has blurred the traditional distinction between common carrier activities and other elements of the communications and data processing industries.

The success of future regulatory action will depend in large part on its ability to accommodate these factors. This paper will seek to explore various dimensions of the problem with a view toward presenting a better delineation of the issues involved, a critique of regulatory policy, and recommendations for improving commission control.

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The views expressed in this paper are those of the author and do not necessarily reflect those of the Institute.

I

THE RATIONALE AND OBJECTIVES OF REGULATION

A. Rationale

The current market structure of the domestic communications industry contains a number of factors which require economic regulation of earnings, prices, investment, entry, and exit in order to promote the public interest.

The first factor justifying regulation is the existence of externalities. Externalities are large benefits that accrue to nonusers or nonconsumers of a service, or heavy costs that are borne by nonproducers, so that the actual prices and costs fail to accurately reflect marginal social gains and marginal social costs. Under these circumstances, private profit maximization will yield suboptimal results.

It is reasonable to assume that the indirect effects or externalities associated with common carrier communications are far greater than the direct impact of these services. Increased productivity, improved geographic resource mobility, and the current revolution in applying computer technology to research and production, are all attributable in some degree to improved communications. In addition, broad changes in social, cultural, and political values may also be considered, at least in part, as an indirect product of improved communications. Indeed, few sectors enjoy the widespread externalities that can be imputed to common carrier communications, and the gap between the value of the service to the immediate user and the indirect benefits and costs to society is substantial.

A second factor justifying regulation is the existence of a distinctive set of cost characteristics associated with supplying common carrier services. Depending on the time period or stage of production under consideration, these firms display high threshold costs, common costs, joint costs, and economies of scale. The combined effect of these cost characteristics is to introduce economic forces which tend both to limit the number of firms in a given market and to increase the basis for discriminatory pricing. Discretion in the assignment of costs does not necessarily mean that reasonable assignments which relate plant and facility usage to particular classes or types of customers cannot be made. Rather, the strategic question is, who shall make these judgments regarding cost assignment in such a setting? Clearly, the public interest would dictate that the duly constituted administrative agency should exercise this responsibility.

A third factor justifying regulation is the need to assure that public resources required for the provision of communications services will be efficiently utilized. No one knows with any degree of assurance the extent to which particular firms supplying communications services are subsidized by the absence of user charges for the radio frequency spectrum. The magnitude is undoubtedly significant, and some rationing mechanism is necessary. At present this is done by an administrative agency. The substitution of an auctioning process, or the imposition of user charges,

would still require agency supervision. If the spectrum is rationed by auction, a balance must be struck between public and private sector usage, unless it is assumed that public uses are going to bid for spectrum space. Within the private sector some judgment is also required to prevent the dominant firm, notably American Telephone & Telegraph, from absorbing all of the frequency spectrum as a device to foreclose competition and then capitalizing these fees as a basis for expanding earnings requirements. In the absence of an auctioning process, some judgment would still have to be made as to the size and magnitude of user charges. The important point is that private costs may not adequately reflect social costs. To that extent, profit maximization per se becomes a poor guideline for assuring the attainment of social objectives.

Fourth, regulation is necessary to curb the potential for abusive pricing practices inherent in the demand for communications services. Given the range of differing demand functions of varying elasticities and cross-elasticities, as well as the discretionary ability to assign costs, the temptation to exploit markets which are inelastic to price increases is so great that some countervailing social restraints are necessary.¹

Fifth, common carrier service derives its value from the universe that can be reached by any given subscriber. Under these circumstances, artificial restraints (whether imposed by interconnection restrictions or discriminatory prices) which limit this market are contrary to the public interest. Lack of compatibility between subscriber units, with a consequent loss of systemic integrity, is equally detrimental. A potential conflict between public and private objectives therefore arises. Profit maximization may dictate that the carrier strive for product differentiation. The consumer, on the other hand, will be interested in the greatest freedom of choice in terms of access to the system.

B. Objectives

Granting the need to continue some form of social control, it is desirable to set forth the general objectives of common carrier regulation. For the most part these objectives are similar to those of the perfectly competitive market. The difference

¹ The potential for price discrimination may be illustrated by considering the number of variables that can be manipulated in setting exchange telephone rates. For example, it is possible to vary (1) the base charge or minimum rate; (2) the message allowance for various message rate classes; (3) the incremental charge under the message rate, thereby changing the balance between the base rate and the incremental charge; (4) the classification of customers within and between service classes; (5) the rate per class of subscriber by geographic location; and (6) the creation of new exchanges, the consolidation of existing exchanges, and the redefinition of exchange boundaries. This list can be expanded by including toll telephone service and private line service. It is further aggravated by the fact that some markets are monopolistic while other markets are subject to selective competitive pressures, thereby creating a potential for cross-subsidization. For a further discussion of the need to control price discrimination, see Trebing & Melody, *An Evaluation of Domestic Communications Pricing Practices and Policies*, in *1 PRESIDENT'S TASK FORCE ON COMMUNICATIONS POLICY, THE DOMESTIC TELECOMMUNICATIONS CARRIER INDUSTRY* (Staff papers, 1969).

lies in the need to use government intervention as a means for attainment. The forces for change attending growth and technological advance may alter aspects of these objectives, but they remain as valid goals for public policy.

First, regulation should promote an allocation of resources between common carrier communications and other sectors of the economy that is consistent with consumer wants. By achieving this balance there will be neither under- nor over-investment in a particular industry, and the resource employment over time will reflect both consumer wishes and the opportunity costs of expanding common carrier communications services vis-à-vis other goods and services.

Second, regulation should encourage the maximum efficient use of communications plant and facilities through the promotion of high load factors and the exhaustion of all economies of scale.

Third, regulation should prevent undue discrimination, both within a given class of subscribers or customer groups and between classes of subscribers, thereby mitigating any adverse effects associated with a monopolistic redistribution of income.

Fourth, regulation should prevent rigidities in the domestic communications industry which impede innovation, technological change, or other evidence of superior performance. Rigidities may be associated with the perpetuation of the status quo as conditions change or with restraints that impede the actions of exogenous variables and the adaptation to change.

Fifth, regulatory techniques should produce aggregate revenues sufficient to cover the economic cost of service for an efficient, well-run communications common carrier. It should be noted that this sum is not necessarily identical with the total revenue requirements derived from a public utility's books of account during a conventional ratemaking proceeding. Given the infirmities of cost-plus controls and the cumulative effect of regulatory lags, there is no assurance that revenue requirements will approximate the resource requirements of an efficiently managed entity.

Finally, regulation should assure adequate service, with the maximum number of options for consumer choice consistent with the consumer's willingness to pay for this variety of offerings.

II

HISTORICAL DEVELOPMENT OF THE MARKET STRUCTURE OF DOMESTIC COMMUNICATIONS

In large part, the challenge to the adequacy of regulation has come from the impact of growth and technology on the current market structure of the domestic communications industry. The prevalent structure, which is now in the process of change, has been characterized by the uneasy coexistence of monopoly and competitive markets. Changes in this structure will have far-reaching consequences in terms of corporate conduct, performance, and the task of regulation.

However, this structure cannot be properly understood unless it is placed in historical perspective. This requires a narrative account of the development of common carrier communications. Interwoven with this historical pattern are important explicit and implicit assumptions about the role of common carrier communications, the changing philosophy of regulation and promotion of the public interest, and the gradual development of the techniques of commission control. For convenience, the historical development of the telecommunications industry can be divided into four periods.

A. The Early Period of Monopoly

The first period covered the years 1851-94, and was characterized by monopoly-duopoly market structures. The Western Union Telegraph Company, chartered in 1851, achieved an early dominance in the field of telecommunications and became the first nationwide monopoly. As such its pricing and service policies typified the classic description of the evils of monopoly behavior.² A major threat to Western Union's position arose when Bell patented the telephone in 1876. Western Union responded to the challenge of the infant Bell Company with an improved telephone developed by Elisha Gray and Thomas Edison. However, the telegraph company apparently believed that a protracted conflict with Bell would prove too costly, and in 1879 a settlement between the two firms resulted in a private division of the market. Western Union agreed to stay out of voice communications, and Bell agreed to stay out of the telegraph field. A duopoly was thus established by agreement, and an intra-industry confrontation was avoided.

Perhaps the most important event of this period occurred when Theodore N. Vail became president of the Bell Telephone Company. Vail proceeded to establish a corporate structure which was ultimately to become the dominant pattern for industrial organization for the entire common carrier industry. Vail viewed telecommunications, and particularly the telephone, as a nationwide, interwoven system with the Bell Company as the dominant firm. He proceeded to implement this concept by (1) licensing operating companies at the exchange level in a fashion that gave Bell financial control through stock ownership and substantial income through rental fees; (2) establishing a long-lines department which would meld the individual companies into a nationwide system; and (3) acquiring control of Western Electric (a former Western Union affiliate) in 1882 to serve as an equipment supplier.

The Bell Company prospered under Vail's management while Western Union's position deteriorated. Vail introduced pricing and service policies designed to assure full exploitation of the market and the maintenance of the supremacy of the Bell Company in voice communications.³ Vigorous prosecution of patent infringements

² See Goldin, *Governmental Policy and the Domestic Telegraph Industry*, 7 J. Econ. Hist. 57-58 (1947).

³ Value-of-service pricing occupied an early, crucial role in Bell's approach to communications. Rates were set on the basis of relative demand elasticities. The first charges established were flat rates, reflect-

and the policy of market sharing with Western Union served to complete the picture.

B. The Establishment and Demise of Competition

The expiration of the basic Bell patents in 1894-95 served to introduce the second phase (1894-1913) in the development of the domestic communications industry. A major barrier to entry had disappeared, and independent telephone companies challenged Bell in the exchange markets. Some idea of the rapid rate of growth of the independents can be obtained by noting the number of telephones in service. In 1894, Bell had 266,431 phones in service, and a decade later the number had increased to 1,317,178. During the same period, the number of independent phones increased from zero to 1,053,866.⁴ The market structure of the common carrier industry had changed dramatically. For the first time, direct competition existed on an intra-industry basis.⁵

Bell was not slow to react to the competitive challenge of the independents, and its massive response indicated the capacity of a horizontally and vertically integrated system for retaliation. Theodore Vail came out of retirement to direct the operation, and Bell responded on four fronts: (1) Bell supporters were able to destroy the efforts of the independents to establish a competitive long-distance system by denying financial resources to the Telephone, Telegraph & Cable Co.;⁶ (2) Bell exercised political pressures to curb the growth of the independents; (3) Bell companies refused to interconnect with non-Bell companies at both the exchange and toll tele-

ing the fact that the telephone was more "valuable" for the commercial subscriber than for the residential subscriber. The rates were \$20 a year for "social service" and \$40 a year for business users. The market was further segmented as rate structures distinguished between urban markets of various sizes, and between urban and rural markets. An additional refinement was made when flat rates were complemented by the introduction of measured service. Measured service determined the bill on an output or usage basis. See H. BARKER, PUBLIC UTILITY RATES 319, 320, 330 (1917); L. NASH, PUBLIC UTILITY RATE STRUCTURES 116 (1933).

⁴ See J. GOULDEN, MONOPOLY 62-63 (1968).

⁵ The rapid proliferation of telephone companies was a mixed blessing from the standpoint of the consumer. While average prices appear to have declined, a burden was imposed on the consumer through the absence of an interconnected network. Too often the consumer who desired complete service coverage had to subscribe to two or more systems. The concept of natural monopoly undoubtedly received a considerable assist from this inconvenience. Nevertheless, performance in the competitive phase was impressive. Total factor productivity in the telephone industry increased at an average annual rate during the period 1899 to 1909 which exceeded the average annual rate of increase for any subsequent period. See J. KENDRICK, PRODUCTIVITY TRENDS IN THE UNITED STATES 136-37 (1961); J. Kendrick, Productivity Trends in the U.S. Private Economy and the Public Utilities, 1948-1966 (mimeo.).

Technological advance was also considerable. The independents introduced the dial system on a widespread basis, pushed telephone service into smaller communities and rural areas, and certainly contributed to lower prices. A precise measure of the fall in price is not possible because of the lack of data and the difficulty in establishing a uniform unit of output. For a further discussion, see Testimony of Richard Gabel, GSA Exhibit 2, at 14-17, in Domestic Telegraph Investigation, No. 16258 (F.C.C.); Gabel, *The Early Competitive Era in Telephone Communications: 1893-1920*, in this symposium, p. 340.

⁶ J.P. Morgan, with a heavy financial involvement in the Bell System, is reputed to have blocked independent efforts at underwriting the Telephone, Telegraph & Cable Co. See GOULDEN, *supra* note 4, at 66.

phone levels;⁷ and (4) Bell pursued an aggressive program to buy up independent telephone properties. By 1910, the threat of the independents had largely been overcome,⁸ and the stage was set for the universal service which Vail envisioned as the objective of the American common carrier system. As an aside, it should be mentioned that the Bell System had acquired control of Western Union through a stock acquisition in 1909.

Public policy was excessively permissive during most of the period 1894-1913.⁹ By 1913, however, the Wilson Administration moved in a two-pronged assault on Bell domination of the telephone and telegraph industries. The Department of Justice and the Post Office Department argued respectively for antitrust action and public ownership.¹⁰ Bell acquiesced to the pressure in 1913, and, in the Kingsbury Commitment, agreed to extend interconnection privileges to the independents and to halt the acquisition of competitive independent companies. Further, Bell divested itself of Western Union.

The second phase in the development of the domestic communications industry indicated clearly that, in the absence of conscious public policy, there was little hope for the maintenance of intra-industry competition as a viable force in the face of a nationwide integrated holding company system.

C. Monopoly Re-established

In the third period (1913-59) the Bell System was to come close to realizing Theodore Vail's goal of "one system, universal and intradependent."¹¹ To achieve this objective, Vail emphasized two points: (1) the elimination of competition,¹² and (2) the need for Bell management to take a cooperative attitude in dealing with the early state regulatory commissions.¹³ The former was a *fait accompli* by 1913; the latter was an extraordinary display of foresight. Unlike many public utility

⁷ In some instances Bell companies were forced to interconnect in the years prior to 1913, but such cases were isolated and of little consequence. See GOULDEN, *supra* note 4, at 69-72.

⁸ Although the independents remained numerically large, they had lost virtually all of the large urban markets. The extent of this loss may be seen by noting that Lincoln, Nebraska, and Rochester, New York, were among the largest cities retained by the independent companies.

⁹ In part this can be explained by the fact that modern state commission regulation began only in 1907, while the Interstate Commerce Commission did not have jurisdiction over interstate toll rates until the Mann-Elkins Act in 1910. Except for the pioneering attempt of the Wisconsin commission to fix rates on a cost-of-service basis rather than on value-of-service, little was done at the state level. For an indication of the Wisconsin results, see *St. Croix Tel. Co.*, 1916A P.U.R. 552 (Wis. R.R. Comm'n 1915); *Bogart v. Wisconsin Tel. Co.*, 1916C P.U.R. 1020 (Wis. R.R. Comm'n 1916).

¹⁰ The Post Office Department's proposal is contained in GOVERNMENT OWNERSHIP OF ELECTRICAL MEANS OF COMMUNICATION, S. Doc. No. 399, 63d Cong., 2d Sess. (1914).

¹¹ Writing in the autumnal phase of his career, Vail took occasion to state the cardinal element of this policy in 1916 AT&T ANN. REP. 40-41: "The telephone system to give perfect service must be one in which all parts recognize a common interest and a common subordination to the interests of all, in fact it must be 'One System,' 'universal,' 'intradependent,' 'intracommunicative,' and operated in a common interest. Such is the Bell System."

¹² *Id.* at 42, 45, 46.

¹³ *Id.* at 34.

managements of that era, Vail apparently recognized that a rapport with the regulators would be a prerequisite if Bell were to maintain itself in a market structure that had become essentially monopolistic.

The Bell System proceeded to perpetuate its position of dominance through a series of interrelated market structure and pricing policies which represented successive refinements of practices initiated in earlier periods. The firm controlled entry through restrictions on foreign attachments, restrictions on interconnection with non-common carriers, and limitations on interchange of facilities agreements. Further, Bell controlled the rate of technological advance through vertical integration with Western Electric and Bell Laboratories. Finally, within this context, the telephone company refined its pricing practices to produce an amalgam of value-of-service pricing and general rate averaging. Statewide ratemaking, system-wide averaging in the design of uniform toll rates, peak and off-peak toll rates, and different mixes of flat and measured service tariffs produced a degree of market segmentation seldom theretofore experienced.¹⁴

It would, of course, be false to assume that Bell did not expand into new fields. AT&T purchased all of the stock of the Teletype Corporation in 1930, and in 1931 introduced TWX service. It also continued to be the principal supplier of private line telegraph service, thereby justifying its designation as both a telephone and telegraph company. Western Union made rather feeble efforts to counter TWX through serial service and timed wire service. But, for the most part, the telegraph company continued to exist largely at the sufferance of the Bell System.

Bell's image was refined in this period through the good offices of its president, Walter Gifford. Enlightened management behavior and corporate statesmanship were established as goals, and emphasis was placed on quality of service and financial conservatism.¹⁵

It was during this era that the modern philosophy of common carrier regulation was established and the tools or techniques of control were developed. Given Bell's dominance, together with the absence of significant entry and intermodal rivalry, it is perhaps understandable that regulation became preoccupied with the general level of earnings or revenue requirements. With the possible exception of the Federal Communications Commission's investigation of the telephone industry in the 1930s, aggressive regulatory concern over matters affecting market structure and price structure was almost nonexistent.¹⁶ What emerged was a philosophy of "natural

¹⁴ See Trebing & Melody, *supra* note 1, at 58-142, 261-71.

¹⁵ These policies paid off in the late 1920s and 1930s, when Bell emerged unscathed from the holding company scandals, while the electric utility holding companies fell into ill repute and were subsequently dissolved under the watchful eye of the SEC. Perhaps another benchmark of Bell's success may be found in the absence of a significant public ownership movement in the field of domestic communications. In contrast, approximately 24% of the output in the electric utility field comes from publicly-owned facilities.

¹⁶ FCC, REPORT ON THE INVESTIGATION OF THE TELEPHONE INDUSTRY IN THE UNITED STATES, H.R. Doc. No. 340, 76th Cong., 1st Sess. (1939). In 1949, the Department of Justice did bring an antitrust

monopoly” for common carrier communications in which the promotion of the public interest was equated with the successful operation of the Bell System. Bell was entrusted with the maintenance of systemic integrity and the task of planning for national and regional requirements.

This regulatory posture was undoubtedly rationalized in terms of promoting the general welfare. Control of extortionate profits at the over-all level was assumed to establish an essential harmony between the objectives of the firm, reasonable prices, the pattern of resource allocation, and the satisfaction of consumer wants. System-wide planning by the Bell System was expected to assure the efficient use of plant and facilities because of the ability of one firm to determine over-all requirements, alternate routings, and reserve capacity. In addition, it was assumed that Bell would innovate at a rate sufficient to maintain the quality of service and satisfy the needs of subscribers. Of course, very little was said about the effects of price discrimination and the maintenance of a market structure that was quite rigid. Apparently the logic of price discrimination under increasing returns was accepted as a reasonable basis for value-of-service pricing and system-wide averaging. It also appears to have been the rationale for ignoring the degree to which individual rate levels for particular services were compensatory.¹⁷

D. The Growth-Technology Challenge

In the postwar period, a combination of economic growth and technological change transformed the market structure of common carrier communications and produced the current monopoly-competitive setting. Undoubtedly, national growth alone could have been accommodated by a reliance upon “universal service” had it not been for new technology which created new markets and new alternatives for supplying these needs. For the first time, non-common carrier options were readily available.

The new technology centered around microwave transmission, satellite systems, and the advent of the computer. It is difficult to ascribe these changes to a particular source, but it is evident that a new force was at work—notably massive government involvement in research and development. Microwave, for example, was the product of national defense efforts during World War II. In the postwar years, public

action seeking to force the divestment of Western Electric. However, the resultant consent decree allowed Bell to retain this manufacturing affiliate and did not seriously impair the System's vertical structure. See *United States v. Western Elec. Co.*, 1956 Trade Cas. 71,134 (D.N.J.) (consent decree); Irwin & McKee, *Vertical Integration and the Communication Industry: Alternatives for Public Policy*, 53 CORNELL L. REV. 446, 457-58 (1968).

¹⁷ A notable exception was the effort of the FCC to determine the revenue requirements for TWX. At the request of the Commission, Bell undertook studies in 1934 and 1952 which showed that TWX was earning a return on full costs substantially below the over-all interstate return for all Bell services. See Report of the Telephone and Telegraph Committees of the FCC at 194-95 (filed Apr. 29, 1966), Domestic Telegraph Investigation, No. 16258 (F.C.C.) [hereinafter cited as Telegraph Report].

expenditures for research and development continued at a high level.¹⁸ The President's Task Force on Communications Policy succinctly summarized the contribution of government R&D as follows:

The transistor, for example, was developed partially as a result of background research on silicon detectors for radar during World War II. Other instances of government R&D with substantial payoff in non-government applications include the whole field of microwave technology; the maser and laser; military exploitation of higher frequency devices; integrated circuits; low-power, lightweight computers for aircraft and missiles; and the communications satellite.¹⁹

In contrast with the years from 1913 through the close of World War II, Bell was no longer the exclusive source of R&D in the field of communications. Despite AT&T's vertical integration, R&D from the public sector was to have significant spillover effects on the structure of the common carrier industry.

The first challenge from microwave technology became evident in 1946. Several companies announced plans for microwave systems between selected Eastern cities.²⁰ The Bell System responded with a massive effort to integrate microwave capability as a part of its nationwide communications network. This was accomplished through a crash program which resulted in the development of TD-2 radio relay facilities.²¹ While the immediate impact of microwave had been allayed, the competitive threat had not been eradicated.

By late 1956, it was clear that further confrontation was inevitable. Prospective private users asked the Federal Communications Commission for access to segments of the radio frequency spectrum for non-common carrier microwave service. This request was joined by the suppliers of microwave equipment, and the stage was set for a heated contest between user groups and equipment suppliers, on the one hand, and the common carriers on the other. At issue were the radio frequencies above 890 megacycles; hence this became known as the "*Above 890*" case (Docket No. 11866). The potential entrants argued that there was sufficient space available in the spectrum and that overcrowding would not result. They also argued that liberalized entry would enhance consumer choice and promote competition in the communications equipment markets. The carriers argued that the frequency spectrum was a scarce resource and that common carrier needs were paramount. The carriers also argued that selective entry would result in cream-skimming and significant revenue losses.

¹⁸ Quantitative estimates of government R&D in communications are difficult because of the multi-dimensional nature of government involvement and spillover effects. For a broad discussion, see PRESIDENT'S TASK FORCE ON COMMUNICATIONS POLICY, *THE ROLES OF THE FEDERAL GOVERNMENT IN TELECOMMUNICATIONS* 23-29 (Staff Papers, 1969).

¹⁹ *Id.* at 25-26.

²⁰ Early efforts to establish microwave systems are described in detail in Beelar, *Cables in the Sky and the Struggle for Their Control*, 21 FED. COM. B.J. 26, 29-33 (1967).

²¹ F. Scherer, *The Development of the TD-X and TD-2 Microwave Radio Relay Systems in Bell Telephone Laboratories* (Weapons Acquisition Research Project, Harvard Univ., mimeo., Oct. 1966).

The Commission issued its Report and Order in 1959, liberalizing entry policy by permitting non-common carriers to utilize the frequencies above 890 megacycles.²² By this action the Commission had eliminated the radio frequency spectrum as a major barrier to entry. It had also taken a large step toward translating the new technology into new forms of communications and had set the stage for private microwave and direct satellite service. This decision is of such historic significance that it serves to distinguish the fourth phase or period (1959 to date) in the development of the domestic communications industry.

In the years that followed, the impact of technology extended far beyond microwave transmission. Satellite communications offered the prospect for further reductions in point-to-point communications costs. Computer technology led to new demands for the teleprocessing of data, but it also created new methods for communications switching as well as a capability for the store-and-forward handling of messages. At the same time, customer requirements for new types of terminal equipment increased rapidly, and the emergence of the computer led to the concept of a computer utility which used communication lines to permit shared access to a central computer by a variety of subscribers at different points. The distinction between the rapidly growing computer-teleprocessing industry and the common carrier had become uneasy at best. Finally, CATV emerged as a method for program transmission and distribution which made use of exchange telephone facilities. However, the CATV systems also hold the potential for disrupting exchange and long-haul communications, for they offer a broadband communications capability to home and business. Individual CATV systems can be linked over independent microwave systems to establish competitive networks.²³

AT&T could not take its dominant position for granted after the *Above 890* case, and it reacted with a series of selective price reductions (Telpak) in particular submarkets and new service offerings—such as WATS (Wide Area Telephone Service) or WADS (Wide Area Data Service). These new tariffs, in turn, had strong repercussions for Western Union. The telegraph company had been raising rates in the public message service in order to meet costs and finance a program of diversification into the private-line field. However, Bell's significant rate reductions (up to eighty-five per cent) in these private line markets jeopardized the continuance of the telegraph company. The plight of Western Union led to the FCC's Domestic Telegraph Investigation.²⁴ As part of this inquiry Western Union alleged that Bell was using its monopoly voice services to subsidize reductions in Telpak and the record services. Accordingly, Bell was required to submit an estimate of the rate of return for each of its major interstate service offerings. The resultant Seven-Way Cost Study indicated high returns on the monopoly voice services and low

²² Allocation of Frequencies in the Bands Above 890 Mc., 27 F.C.C. 359 (1959), *aff'd on rehearing*, 29 F.C.C. 825 (1960).

²³ See Trebing & Melody, *supra* note 1, at 85-87, 178-96.

²⁴ Domestic Telegraph Investigation, No. 16258 (F.C.C.).

returns on the allegedly competitive private line and record offerings.²⁵ Perhaps more than any other factor, the Seven-Way Cost Study led to the AT&T investigation in Docket 16258. The result was that the Commission was compelled to abandon "continuous surveillance" and come to direct grips with the pricing behavior of the Bell System as it reacted to the threats confronting it. Discussions of pricing guidelines began to intrude into the favored position long occupied by the cost of capital in regulatory proceedings.

Technology had transformed common carrier communications from a relatively stable industry to one in which change was coming at a faster rate than it could be assimilated by existing market structures and institutions. The structure based upon Bell monopoly, which had prevailed from 1913 to 1959, had been transformed. The new market structure that appeared in the years after 1959 was an ill-defined admixture of monopoly and competition—varying between different markets and submarkets.

Two significant questions remain to be answered in this setting: First, are there reasonable grounds for assuming that the rivalry between the participants in the coming struggle for markets will lead to an outcome that is consistent with the public interest? Or, expressed somewhat differently, will the current monopolistic-competitive structure promote public-interest objectives in terms of resource allocation, efficient use of facilities, innovation, and the minimization of discrimination? Second, have regulatory policies been sufficient to promote the general welfare in this new phase of the development of the common carrier industry? As a corollary, the question can also be raised whether the rationale and scope of regulation have changed in the new setting. The balance of the paper will be devoted to an exploration of these questions.

III

CONFLICTING STRATEGIES AND IMPERFECT MARKETS

The rapidly expanding demand for voice, record, data, and video-program communications forecast for the 1970s and 1980s has created attractive markets for AT&T, Western Union, Comsat, and potential entrants. The stakes are high for all of the groups involved. If the Bell System and the common carriers fail to establish a strong foothold in these future markets, they can look forward to drastically reduced rates of growth and significant shrinkage in relative importance. On the other hand, the new entrants are seeking to establish basic positions that will enable them to participate in the growth in the decades ahead.

Each of these protagonists will seek to employ a number of variables to special advantage. At present the focus of attention centers on the barriers to entry: economies of scale, threshold costs, and product differentiation. In addition, there is the legal

²⁵ See Telegraph Report, *supra* note 17, at 200-04.

barrier to entry, notably the requirement for certification of new entrants. These barriers are subject to direct and indirect manipulation through a number of strategies. A review of these strategies is illuminating, for it provides a basis for assessing whether such rivalry is a workable proxy for a competitive market, thereby permitting a relaxation of regulation. The interplay of these strategies, together with behavior patterns ascribable to the firm operating under regulatory constraints, can also provide some insight into the consistency of the probable outcome with the objectives of regulation.

A. Objectives and Strategies of Existing Common Carriers

1. *The Bell System*

The Bell System has a paramount interest in maintaining its share of future communications markets. The horizontal market (that is, the percentage of all households and business firms with telephones) is rapidly approaching saturation. Therefore, continued growth depends upon Bell's ability to maintain a major position in the new markets for communications services. These include teleprocessing and broadband service to the home and business. It is to the Bell System's advantage to employ its still dominant position to exclude new entrants and seek to re-establish control over the rate of innovation. The key variables in this process are (1) pricing policy; (2) interconnection restrictions; (3) use-of-facilities restrictions; (4) foreign-attachment restrictions; (5) procurement policies; (6) pre-emption of the radio frequency spectrum; and (7) contesting of applications for entry by new firms before regulatory agencies. It is difficult to state with certainty how each of these variables has been employed either singly or in combination.

As noted previously, Bell had employed patent licensing to restrict competition (prior to 1894); had refused to interconnect with independents (1894-1913); had refused to sell equipment to independents (prior to 1908); and had contested non-common carrier use of the radio frequency spectrum (the *Above 890* case, 1959). None of these strategies appears to be in use at the present time. Instead, greater reliance now seems to be placed on pricing policies, restrictions on foreign attachments and interconnection with non-common carriers, and contested applications for certification of new entrants. This may be seen in the introduction of Telpak, WATS, WADS, and more recently in the Series 11,000 tariff. Interconnection and foreign-attachment restrictions have been vigorously enforced insofar as voice communications is concerned, and, despite the *Carterfone* case, it is by no means certain that free access to the voice network is at hand. On the other hand, restrictions against subscriber-owned terminal equipment in the data field have been far more liberal. Bell has also challenged new entrants with varying degrees of success. It has success-

fully opposed the development of single-purpose domestic satellite systems,²⁶ but it failed in its efforts to foreclose a new microwave system between St. Louis and Chicago.²⁷

Bell's rationale for these actions is much like that offered during the previous era. The carrier argues that it must prevent deterioration of the quality of message toll telephone and exchange service by assuring systemic integrity and by prohibiting circuit drain and line interference. It also argues that these policies are necessary to achieve maximum exploitation of the economies of scale inherent in modern long-haul communications and the full use of common carrier plant. It argues that new entry would result in cream-skimming, diversion, waste of the radio frequency spectrum, and increased costs to the consumer using the DDD network.

2. *Western Union*

Western Union's objective appears to be the promotion of a market structure that will permit it to coexist with the Bell System while at the same time giving the telegraph company an opportunity to establish itself in the record and data transmission field. Its recommendations regarding pricing, interconnection, and interchange of facilities, as well as its hostility to new entrants, reflect policies designed to maintain competitors rather than competition. Western Union has advocated umbrella pricing for services that are supplied competitively with AT&T services (for example, private line telegraph).²⁸ It has also proposed a division of the voice and record markets, with the voice market to be given to Bell and the record market to Western Union.²⁹ Western Union also advocates relative freedom in its use of Bell System facilities, with restrictions imposed upon new entrants.

Western Union's rationale for this course of action seems to be premised on the belief that it is desirable to maintain competition in domestic communications, and that a strengthening of the telegraph company is necessary in order to provide continued message telegraph service. Western Union's strong efforts at diversification, as well as its policy of consistently raising telegraph prices in the face of an elastic demand function,³⁰ cast doubt on the merit of these objectives. Similarly, the company's recently announced plans for forming a holding company would indicate

²⁶ According to a statement issued in October 1969, AT&T has apparently abandoned its opposition to single-purpose domestic satellite systems in favor of a policy of free entry. Bell stated that it "believes the wisest public policy at this time would be to permit any organization or group interested in establishing a domestic satellite system—including the networks—to apply for a license to establish and operate such a system." Continuing, AT&T added that it "anticipates that, when it makes good technical and economic sense to do so, [AT&T] will seek authorization to use satellites in its own operations." 35 TELECOMMUNICATIONS REP., Oct. 20, 1969, at 5.

²⁷ Microwave Communications, Inc., Nos. 16509-19 (F.C.C., Aug. 13, 1969) [hereinafter cited as MCI].

²⁸ See Telegraph Report, *supra* note 17, at 268-78.

²⁹ See *id.* at 279-94.

³⁰ See *id.* at 83-124.

that it intends further diversification as a basis for survival.

3. *Comsat*

The Communications Satellite Corporation is a third participant in the rivalry for the future domestic communications market. Domestic satellite service will eventually be authorized, and Comsat would undoubtedly prefer to be the chosen instrument. In particular, Comsat would like to participate in television program transmission which will make extensive use of satellite communications. To secure this position, Comsat has proposed to make satellite channels available on a pilot project basis for educational television. It has also vigorously opposed the plans for single-purpose systems sponsored by the Ford Foundation and the American Broadcasting Company.

B. Objectives and Strategies of Potential Entrants

In contrast to the position of AT&T and Western Union as common carriers, and Comsat as a carrier's carrier, stand the potential entrants. This group includes a diverse array of firms, ranging from microwave transmission companies seeking to provide limited common or contract carrier service, to computer service bureau companies seeking to sell data processing. All of these groups have one characteristic in common: they seek to have restrictions on entry removed or modified in order that they may serve particular segments or portions of the communication and teleprocessing markets. In some instances, they wish to be directly competitive in the private-line market.³¹ In other cases they seek to obtain greater flexibility in the tariffs governing the use of common carrier services as part of their offering.³² They may also want to install single-purpose satellites,³³ offer a specialized switched communications service,³⁴ or provide a CATV service over telephone company facilities to reach a residential market. The rationale given by all of these groups is that they will bring a greater range of choice to the consumer, supply services which are not currently available, and increase the range of options in terms of leasing versus buying.

The danger lies in the ability of such entrants to denigrate existing common carrier services, impair the attainment of economies of scale, and contribute to the wasteful usage of the radio frequency spectrum. It is also possible that potential

³¹ *E.g.*, MCI *supra* note 27.

³² *See* Responses filed in Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities, No. 16979 (F.C.C., 1966) [hereinafter cited as FCC Computer Inquiry].

³³ The Ford Foundation's domestic satellite proposal may be cited as an illustration. *See* Reply Comments of the Ford Foundation, vol. 1, Establishment of Domestic Communications Satellite Facilities by Nongovernmental Entities, No. 16495 (F.C.C., filed Dec. 12, 1966).

³⁴ The abortive efforts of Bunker-Ramo to supply Telequote IV may be cited as an illustration. Bunker-Ramo added computer switching to the computerized quotation service which it offered to members of the securities industry. By this action, it was considered to provide a regulated service.

entry will be employed by large-volume consumers to extract special rate concessions from the carriers, thereby placing an added burden on the monopoly services.

To summarize, the current market structure is one in which powerful entrenched common carriers employ a range of entry and pricing variables to foreclose new firms or to sharply differentiate the product or service of such new firms. In contrast, the new entrant seeks to establish itself in highly selective specialized sub-markets of communications with strong potentials for future growth. There appears to be little evidence that the new entrant will challenge the established carriers in the broad public message telephone and record markets. Hence, the current competitive pressure is highly eclectic, and the resultant markets are very imperfect.

The effect of these imperfect markets on public interest objectives is aggravated even further when one considers the melding of two important influences: first, the common carriers' unique position in serving both competitive and monopolistic markets while seeking to foreclose new entrants; and, second, the general theory of the behavior of the firm operating under regulatory constraints. These two factors combine to further accentuate the magnitude of the problems involved and will be considered in the following section.

IV

INTERPLAY OF REGULATORY CONSTRAINTS, IMPERFECT MARKETS, AND LIMIT-ENTRY PRICING

The theory of the behavior of the firm under regulatory constraints was developed by Averch and Johnson³⁵ and was refined by Wellisz, Westfield, and Klevorick.³⁶ Briefly, this theory contends that when a firm is controlled through the level of earnings, and the actual rate of return is greater than the cost of capital, there will be a conscious incentive for management to expand investment to a point where

$$\frac{\text{total net revenue} - \text{gross revenue-operating expenses}}{\text{total net plant}} = \text{the permissible rate of return.}$$

This is not the traditional argument that the firm will inflate the rate base or seek to substitute reproduction cost for original cost valuation in an effort to improve earnings. Rather, the theory describes a positive inducement for unwarranted expansion which enables the firm to retain or camouflage excessive profits in its public utility monopoly markets that would otherwise be lost through rate reductions. The firm can achieve such an expansion through various courses of action. The first is to maintain excess capacity through an excessive spread between system capacity and peak requirements. The second alternative is to maintain high safety standards

³⁵ Averch & Johnson, *Behavior of the Firm Under Regulatory Constraint*, 52 AM. ECON. REV. 1052 (1962).

³⁶ Wellisz, *Regulation of Natural Gas Pipeline Companies: An Economic Analysis*, 71 J. POL. ECON. 30 (1963); Westfield, *Regulation and Conspiracy*, 55 AM. ECON. REV. 424 (1965); Klevorick, *The Graduated Fair Return: A Regulatory Proposal*, 56 AM. ECON. REV. 477 (1966)

that require proportionally more capital. A third possibility is the selection of more capital-intensive combinations of plant that do not result in lower costs. Fourth, as Westfield has noted, there is an inducement toward increased equipment prices, or at best a minimum incentive to reduce such prices. Finally, there is an incentive to serve noncompensatory or peripheral markets at less than long-run marginal cost.

All of the foregoing approaches for masking excessive earnings can be delineated in conceptual terms, but none can be readily tested on the basis of current empirical evidence. Nor is it possible to establish any priority or ranking among these factors. Nevertheless, it is clear that the potential for rate-base expansion through the employment of rate structures that encourage sales at less than long-run marginal cost is highly relevant for the strategy of foreclosing entry and limiting competition. In this setting the Averch-Johnson hypothesis assumes a unique meaning as part of a larger set of strategies which involve the interaction of regulatory constraints, highly imperfect markets, and limit-entry pricing.

These interrelationships can be set forth in some detail. The established firm can set prices in potentially competitive submarkets at limit-entry levels which are sufficient to foreclose new firms or alternative sources of supply. If successful, this action strengthens the monopoly position of the established firm. Concurrently, it widens the spread between the rate of return and cost of capital, thereby enhancing the inducement to conceal monopoly profits. Further, expanded service on a highly selective basis at limit-entry prices becomes an important means for permitting the firm to mask its monopoly profits through noncompensatory sales. This process could conceivably become self-reinforcing, as low prices strengthen monopoly markets, and provide further incentives for the maintenance or expansion of more noncompensatory sales.

The market structure ramifications of such pricing policies are clear. Indeed, the application of limit-entry pricing in a monopolistic-competitive setting shifts the emphasis from a concern over the relationship between the actual rate of return and the cost of capital to one of maintaining a market structure which perpetuates monopoly profits, through barriers to competition, while ostensibly satisfying regulatory requirements in terms of a fair rate of return on investment.

Four factors enhance the propensity to employ limit-entry pricing in the domestic communications industry. First, present revenues from competitive markets are relatively small compared to the revenues from monopolistic markets. For example, if one assumes that private-line services are the competitive segment of interstate communications, private-line revenues for AT&T are only fifteen per cent of Bell System interstate revenues. This percentage shrinks even more when all Bell System revenues are considered. Such an imbalance gives limit-entry pricing a validity which is often lacking in the manufacturing industries.³⁷

³⁷In manufacturing, where variable costs are high, an attempt to attain monopoly profits by limit-entry pricing for long periods is apt to be self-defeating—especially if price does not cover variable cost.

Second, the existence of common and joint costs in the provision of telecommunications makes cost assignments for particular services arbitrary. The estimation of long-run marginal cost, in the sense that the economist uses the term, is extremely difficult for a complex interconnected nationwide switched network. Indeed, general agreement on a rigorous definition of average and marginal cost at the applied level for a particular communications service will probably never be reached.³⁸ Any solution is apt to be a matter of compromise and expediency.³⁹

Third, the capacity of the dominant firm to manipulate the structure of demand by specifying rates and service characteristics for a range of alternatives will further enhance limit-entry pricing. That is, the common carrier can achieve a high degree of product differentiation within monopoly markets, and between monopoly and competitive markets, that will facilitate limit-entry pricing. Such differentiation stems from the application of foreign-attachment and interconnection restrictions and from the imposition of limitations on Telpak sharing. The compartmentalization of customer groups in this fashion provides an example of the interrelationship between the relevant variables the carrier can employ to maintain its established position.

Finally, limit-entry pricing in communications tends to create a group of buyers with a strong common interest in maintaining the selective rate reduction. It is not uncommon to find such a group taking an aggressive part in adjudicatory proceedings to resist any efforts to correct the imbalance.

At this point, one is confronted with an apparent paradox. The application of price discrimination (or value-of-service pricing) and restrictions on entry during the era of monopoly (1913-59) was thought to promote the public interest. However, when the monopoly-competitive market structure emerged, the same practices apparently held a significant potential for yielding results that were contrary to the general welfare. The difficulty presumably stems from the motives and objectives of the established firm in two different settings. The natural monopoly doctrine assumed that the firm would discriminate between markets in a fashion that shifted the average revenue function to a point where total revenue equalled total cost at the most efficient level of plant utilization. Assuming increasing returns, each customer group or classification would pay lower rates than it would in the absence of price discrimination.⁴⁰ The established firm was assumed to be substantially free from competition and able to optimize in a fashion that produced no significant

This is not as large a consideration in the public utility field. For the classic statement on industrial limit-entry pricing, see Bain, *A Note on Pricing in Monopoly and Oligopoly*, in *READINGS IN INDUSTRIAL ORGANIZATION AND PUBLIC POLICY* (R. Heflebower & G. Stocking eds. 1958).

³⁸ The fact that marginal cost estimates in practice are just as ambiguous as full cost estimates was shown in the lengthy cross-examination of Bell witnesses in Phase 1B of the AT&T rate inquiry. No. 16258 (F.C.C.).

³⁹ The solution to Phase 1B appears to be a recognition that all costs are relevant in determining prices and rate levels. For a more detailed discussion of this action, see text accompanying note 49 *infra*.

⁴⁰ See Clemens, *Price Discrimination in Decreasing Cost Industries*, 31 *AM. ECON. REV.* 794 (1941).

difference between social and private costs at the margin. In practice, a degree of rate averaging, composite pricing, and cross-subsidization was accepted as inevitable.

However, the supposed compatibility of social and private interests is split when the market structure shifts to one in which the carriers employ limit-entry pricing and market structure strategies to foreclose the threat of new entry, while the prospective entrants seek to employ another set of strategies to break into the system. Price elasticities and cross-subsidization are still significant, but they are no longer employed in terms of system optimization, becoming instead weapons to resist entry and insulate the firm against competitive erosion. This applies to *all* of the firms which are supplying common carrier communications vis-à-vis new entrants.

The combined strategies to foreclose entry may retard innovation through the artificial maintenance of monopoly structures and the exclusion of new firms with superior technology. These strategies will also support sales at less than long-run marginal cost, with a consequent distortion in resource allocation. Further, such practices compel the monopoly sector of the communications market to subsidize sales in the competitive sectors, thereby resulting in a redistribution of income. Perhaps the most intriguing consideration, however, is the fact that there are no market forces at work that would tend to offset or control such pressures in the short run.

Of course, it is difficult to develop empirical support for these arguments. Nevertheless, they emphasize the structure-price pressure points which must be given proper attention by regulatory policy.

Recently, the theory of the firm under regulatory constraints has been expanded by Professor William G. Shepherd to consider the relationship between regulation and innovation.⁴¹ Shepherd argues that regulation, by limiting profit levels, shifts the inducement for innovation from profit maximization to risk reduction. Risk reduction, in turn, can be achieved through R&D which enhances the exclusivity of the operating system. Conversely, R&D which tends to be "system-opening" would be avoided because it increases risk. The Shepherd hypothesis is directly applicable to the problems of market structure strategy. Some question can be raised, however, whether it describes a particularly significant barrier to new entry. In an era when large government expenditures for R&D influence communications, it is difficult to argue that the Bell System's efforts to direct R&D toward risk minimization will be a major deterrent to entry in the absence of the structure-pricing practices just discussed.

However, to the extent that the Shepherd hypothesis is applicable and innovation becomes a means to foreclose entry, public policy is confronted with the interesting sequence in which innovation is used to foreclose innovation. There could be

⁴¹ W. Shepherd, *Communications: Regulation, Innovation and the Changing Margin of Competition*, a paper presented at the Conference on Technological Change in the Regulated Industries, Brookings Institution, February 6-7, 1969.

significant social costs stemming from such behavior if the social benefits from less restrictive innovations are high.

V

THE ADEQUACY OF PUBLIC POLICIES⁴²

The current market structure provides a setting in which the existing common carriers, on the one hand, and potential entrants on the other, pursue conflicting courses of action, subject to the constraints of highly imperfect markets and regulation. There is little reason to believe that the outcome would promote the public interest if regulation were removed. The more pertinent problem is how has regulation responded to the challenge, and how may regulation be improved?

The modern regulation of communications common carriers developed during the period of Bell monopoly (1913-59). The practices of the state agencies, and later the FCC, led to a division of responsibility—with regulation assuming a passive review function, while the carrier retained the initiative for decisions regarding pricing, output, and investment (governed only by the common law obligation to serve all comers at reasonable rates). Agencies reconciled themselves to a case-by-case review of problems in a quasi-judicial setting. The hope was that a careful examination of specific problems would establish judicial precedents and provide guidelines having future applicability. Through this division of responsibility, the carrier was able to assume both the initiative and responsibility for defining markets, establishing service standards, prescribing the rate of innovation, and determining the degree and mix of cross-subsidization.

The passive review function has strongly influenced regulation's current response. While this is true at both the federal and state levels, the effects are most clearly evident at the federal level.⁴³ The adequacy of the case-by-case approach in delineating public requirements, the effects of alternative courses of action, and the establishment of guidelines can be ascertained by examining FCC decisions pertaining to the crucial structure-price pressure points. These are (1) pricing, (2) foreign attachments and interconnection, (3) the emergence of specialized long-haul common carriers as new entrants, and (4) the distinction between common carriers and the computer-data processing firms. Each of these areas represents the conflict between opposing forces and demonstrates the need to formulate long-run policy.

⁴² The discussion which follows will be confined to regulatory policies. The broader aspects of total government involvement in communications have been discussed in PRESIDENT'S TASK FORCE ON COMMUNICATIONS POLICY, *supra* note 18.

⁴³ The impact of technology has been greatest at the federal level. Hence the FCC has borne the brunt of adapting regulatory policy to change. The state commissions have dealt primarily with exchange and short-haul traffic. Therefore, the natural monopoly doctrine may still be sufficiently pervasive to offset the generally inadequate resources of the state agencies. However, there is every reason to assume that competitive pressures at the exchange level will soon emerge through the efforts of CATV and software firms to gain selective access to segments of the residential and business markets.

A. Pricing Policies

Communications pricing, as has been shown, occupies a crucial role in the adaptation to technological change and in the diffusion of benefits to all participants. The FCC has approached pricing on a case-by-case basis, and in large part the agency has responded to tariff filings by the Bell System, objections by Western Union, and the pleadings of special interest groups.

After the *Above 890* decision, the Bell System responded to the challenge of new entrants through prices that were designed to both shield and expand its telecommunications markets. WATS, WADS, and Telpak were introduced in the period 1960-61. Western Union challenged the legality of these tariffs, giving particular weight to the effects on Telex, message telegraph, and private-line telegraph. The Commission found WATS to be lawful on a cost-avoidance basis. WADS, on the other hand, was found to be unlawfully discriminatory because inadequate attention was given to the revenue requirements and costs associated with the various classes of users. In effect, the Commission had accepted the wide area concept and established a cost-savings criterion.

The Telpak tariff had a much more complex history. Telpak, introduced in 1961, was essentially a quantity discount for private-line circuits. It offered the consumer the option of taking four classifications of service: Telpak A, twelve voice-frequency circuits; Telpak B, twenty-four voice-frequency circuits; Telpak C, sixty voice-frequency circuits; or Telpak D, 240 voice-frequency circuits. When compared with the traditional private-line tariff, the discount was substantial. For example, the FCC noted that Telpak A involved a fifty-one per cent difference between the price for an equivalent number of individual private-line circuits equipped for voice at 100 miles. Telpak B involved a difference of sixty-four per cent; Telpak C a difference of seventy-seven per cent; and Telpak D a difference of eighty-five per cent.⁴⁴ Thus, the threat of potential entry had effected price reductions up to eighty-five per cent.

Motorola and Western Union challenged the magnitude of the Telpak response, arguing that these tariffs would reduce private-line revenues and burden other users. The Commission found little difference between Telpak and other private-line service, and it found no significant reduction in expenses or costs associated with the Telpak offering.⁴⁵ The Commission turned next to competitive necessity as a justification for discount pricing. It found no justification for Telpak A and B in terms of the threat of private microwave.⁴⁶ However, the Commission did conclude that there was apparent justification for C and D. The Commission appears to have been concerned that the prices for Telpak A and B burdened other classes

⁴⁴ American Tel. & Tel. Co. Tariff F.C.C. No. 250, Telpak Service and Channels, 38 F.C.C. 370, 379 (1964).

⁴⁵ *Id.* at 380-81.

⁴⁶ *Id.* at 387.

of users with no demonstrable offsetting benefits, although it did not foreclose competitive necessity as a justification for significant price reductions in the case of Telpak C and D. Whatever recognition was given to the interrelationship between limit-entry pricing, product differentiation, resource misallocation, and adverse effects on the distribution of income was not made explicit.

The elimination of Telpak A and B aggravated a further dimension of the pricing problem, notably Telpak sharing. Private microwave is attractive only to a limited number of specific users. These are the so-called "right-of-way" companies (*i.e.*, pipelines, railroads, etc.), and a few large industrial and governmental buyers. The Bell tariff permitted these companies to share or divide a given block of circuits. Obviously, unlimited sharing would have the effect of destroying the contribution of Telpak to more effective price differentiation and market segmentation. Successful price discrimination is dependent upon the carrier's ability to compartmentalize various customer groups and offer each of these groups a price based on their respective demand elasticities. Despite the Commission's efforts to broaden Telpak sharing in 1966, the question remains whether these provisions should be further liberalized in order to give small users access to the price discounts embodied in Telpak C and D.⁴⁷ This confronts the Commission with two alternatives. First, it can order liberalized or unlimited sharing, which destroys the effectiveness of market segmentation. There is a possibility that this would result in the elimination of the Telpak tariff. The second alternative is to permit segmentation to continue on the grounds that there are system-wide benefits for all classes of users. Sharing restrictions have clear limit-entry implications. With unlimited sharing, third parties would be free to buy circuits in bulk quantities and resell them to the consuming public. Hence, in resolving the Telpak sharing question, the Commission will have to simultaneously consider problems of price discrimination, systemic integrity, and new entry.

In summary, the common issue facing the Commission in these decisions was the establishment of guidelines for rate structure and rate levels for particular services which recognized, among other considerations, the interrelationship between structure and pricing variables. While these cases gave weight to selected factors, no general guidelines were forthcoming.

The Domestic Telegraph Investigation also called attention to the potential for price discrimination inherent in a monopolistic-competitive structure. It revealed that no simple pricing solution was possible. As part of the Domestic Telegraph Investigation, AT&T was directed to undertake a study to determine the rate level for Bell's seven major groups of services. The resultant Seven-Way Cost Study indicated that the monopoly voice services earned a higher rate of return on allocated

⁴⁷ Telpak Tariff Sharing Provisions of American Tel. & Tel. Co. and Western Union Tel. Co., 8 F.C.C.2d 178 (1967). Note particularly the testimony of W.H. Melody, Common Carrier Bureau Exhibit No. 1.

investment relative to the over-all rate of return for all interstate services than did Telpak and the record-telegraph services.⁴⁸ The value placed on the Seven-Way Cost Study and its successive updatings depends on the importance that one attaches to fully distributed costs as a criterion of reasonableness. It must be agreed, however, that the study served to emphasize that regulation could no longer be complacent about the interrelationship between earnings levels for monopoly and competitive services.

The challenge for regulation has now become one of avoiding exclusive reliance on either the arbitrary judgments of the Bell System insofar as price discrimination is concerned or the rigidities inherent in a simple allocation of fully imbedded costs. The prospects for meeting this challenge cannot be regarded with optimism. The great hope lay in Phase 1B of the AT&T investigation (Docket 16258), which was devoted to the problems of establishing price and earnings-level guidelines for individual services. Phase 1B covered a three-year period, 1966-69, and an impressive parade of witnesses filled 172 volumes of transcript. The results of this mammoth endeavor appeared in the Memorandum Opinion and Order adopted July 29, 1969. The substantive findings were set forth in Appendix A, Statement of Rate-Making Principles and Factors. This statement represented a compromise agreement among the Bell System, the Commission staff, and other parties. It indicated that the following factors were appropriate in considering the rate levels for each principal service offering: (1) the over-all rate of return; (2) fully distributed cost; (3) historical book costs; (4) long-run incremental costs and full additional costs; (5) price elasticity, income elasticity, and cross-elasticity; (6) existing and potential competition; (7) customer requirements; (8) the effects of existing tariff provisions; and (9) the effects of Commission policy upon the availability of consumer alternatives. In effect the statement concluded that all views were relevant in determining the level of rates by service—hardly a major step in the formulation of operational guidelines. Insofar as the actual structure of prices is concerned, the statement held that

Within a given class of service, it is recognized that, for any particular rate level, more than one rate structure could be appropriate. The design of a rate structure should reflect consideration of cost and demand characteristics within the class of service, including peak versus off-peak factors.⁴⁹

Commissioner Nicholas Johnson's dissent in Phase 1B deserves special attention. Commissioner Johnson observed that

. . . [T]he Commission terminates [Phase 1B] without decision The issues and questions remain—and are to be taken up in further proceedings. In order

⁴⁸ See Telegraph Report, *supra* note 17, at 200-04. The original 1964 Seven-Way Cost Study was subsequently updated for 1965 and 1967, and the number of methods for making the allocation was expanded.

⁴⁹ American Tel. & Tel. Co. and the Associated Bell System Companies Charges for Interstate and Foreign Communication Service, App. A, Item 16, No. 16258 (F.C.C., July 29, 1969).

to terminate the present proceeding the Commission "notes" an "agreement" worked out by the contending parties—an agreement concluded by Bell, Western Union, several user groups and the Commission's Common Carrier Bureau

. . . .
[However, the "agreement" is in fact] no "agreement." Rather there is:

- a summary of the contending positions
- acknowledgment that any, all, or none of the viewpoints may or may not be relevant to any particular ratemaking process
- pious statements about firm deadlines and promised studies
- lack of any agreed upon common ground and
- clear promises of renewed battle wherever the Commission again raises the issue of ratemaking principles.⁵⁰

Perhaps the real accomplishment of the statement was to achieve an agreement on the need for collecting more information on a variety of fronts. Concurrently, Bell has filed a new tariff (Series 11,000) which embodies further refinements in private line pricing and has also filed for rate increases in the original Telpak offering. Hence, there is no end in sight for the case-by-case approach to pricing, and the establishment of general guidelines of the type required is more apt to be a matter of happenstance than conscious design.

B. Foreign Attachments and Interconnection

In the past, the tariffs filed by the carriers forbade the user to attach any device to his telephone line that was not furnished by the telephone company, thus precluding any foreign attachments. Obviously, such constraints promoted the public interest to the extent that they maintained systemic integrity. On the other hand, these restrictions were essential for effective product differentiation and restriction of entry.

The Carter Electronics Company manufactured a device that provided a connection between private mobile radio and the carrier's toll network. Accordingly, it was challenged by the carriers in the *Carterfone* case. The Commission decision was a resounding defeat for the principal of carrier-imposed foreign attachment restrictions.⁵¹ However the question of whether the telephone companies should make provision in the tariff for customer-furnished, network-controlled signalling units remained. Further, the decision dealt with interconnection and not with replacement of any part of the telephone system.

Bell's reaction to *Carterfone* was swift. New and revised AT&T tariffs went into effect on January 1, 1969, permitting the attachment of any kind of customer-provided terminal equipment to the telephone company's toll and exchange network. However, the condition was imposed that any network-controlled signalling device, such as the ordinary telephone, had to be furnished, maintained, and installed

⁵⁰ *Id.*, dissenting opinion of Commissioner Johnson.

⁵¹ Use of the Carterfone Device in Message Toll Telephone Service, 13 F.C.C.2d 420, *aff'd on rehearing*, 14 F.C.C.2d 571 (1968).

by the telephone company. When the Justice Department objected that the revised tariffs did not comply with the *Carterfone* decision, the FCC responded that a series of informal conferences, rather than formal evidentiary hearings, would provide a more effective procedure for evaluating AT&T's interconnection and foreign attachment policies.⁵²

Thus, the Commission had chosen to rely on the conference method to gather the information necessary to prescribe foreign attachment and interconnection standards. The National Academy of Sciences was also asked to provide assistance to the Commission in this matter. Interestingly, nine months elapsed before the first conference was held. Whether this approach will be successful in both establishing standards and recognizing market structure implications remains to be seen. Given the infirmities attached to the conference method, there may be sufficient grounds for genuine skepticism.

C. Entry Policy—The MCI Case

Microwave Communications, Inc., proposed to supply point-to-point radio microwave service from St. Louis to Chicago and intermediate points. The MCI offering was unique in that it did not involve complete service—the subscriber had to provide the local loops. However, MCI's rates were significantly lower than those of the common carriers, and MCI provided much greater flexibility in terms of the use of facilities. The Bell System, General Telephone, and Western Union objected to MCI's application on following grounds: (1) that MCI was not financially qualified to construct and operate the proposed facilities; (2) that no need had been shown for the common carrier services proposed; (3) that MCI would be unable to provide a reliable communications service; (4) that the proposal represented an inefficient utilization of the frequency spectrum; and (5) that the proposal was not technically feasible.⁵³

The Commission found no merit in these charges. Significantly, the Commission was unwilling to use the cream-skimming argument as a defense against new entry. It held that if it were to confine entry only to those new firms whose operations would be so widespread as to permit rate averaging, then it would restrict new licensees in the common carrier field to only a few large companies capable of serving the entire nation.⁵⁴ The use of the radio frequency spectrum was also an important factor affecting entry. The Commission felt, however, that

MCI can reasonably be expected to furnish an economical microwave communications service to a segment of the public which presently cannot avail itself of such a service; and that its flexibility features will enable potential users to make more efficient use of their business equipment. These are substantial benefits which, in

⁵² American Tel. & Tel. Co. "Foreign Attachment" Tariff Revisions in AT&T F.C.C. Nos. 263, 260 and 259 (F.C.C., Aug. 13, 1969).

⁵³ See MCI, *supra* note 27, para. 6.

⁵⁴ *Id.* para. 23.

our view, outweigh the fact that MCI will not make the fullest possible use of its frequencies.⁵⁵

The contrast between the traditional view of regulation and what may be the new look can be seen in the dissenting opinion by former Chairman Rosel Hyde and in the separate statement of Commissioner Nicholas Johnson in the *MCI* decision. While Chairman Hyde was greatly concerned because "[t]he effect of the majority decision is to destroy the principle of nationwide average rate making" and felt strongly that the agency "should not authorize new service simply because it constitutes 'competition',"⁵⁶ Johnson decried the absence of long-term policy formulation regarding the objectives of telephone regulation as part of the broader context for treating such issues.⁵⁷ Despite such reservations, the *MCI* decision represents one of the most successful efforts of the FCC to set forth the issues in a fashion that establishes guidelines for the future.

D. The Computer Inquiry

Finally, there is the question of determining the limits of the common carrier industry and the demarcation of the area for applying conventional economic regulation. This problem was forcefully emphasized in the Computer Inquiry. The Commission issued a comprehensive Notice of Inquiry seeking to delineate the pertinent issues in the growing interrelationship between the computer and communications industries.⁵⁸ The method chosen was to invite responses from computer firms and common carriers to a list of far-reaching questions. Next, the Stanford Research Institute was asked to prepare a detailed analysis of the issues involved.⁵⁹ What emerged was a series of self-serving declarations by the parties involved, an abstract of these declarations by SRI, and a series of SRI-sponsored papers which made little or no contribution to the literature on public utility economics, the organization of the industry, or the task of regulation. Perhaps the most intriguing feature of this entire process was the Justice Department presentation, which argued that common carriers should not provide computer services except through arm's-length subsidiaries.⁶⁰ Considering the difficulties involved in assuring such a relationship, the Justice Department response comes close to establishing a per se argument that the common carriers be foreclosed from providing teleprocessing services. At present, it appears that the FCC has most of the distance to travel before an informed judgment can be made about the relationship between common carriers and the computer industry and the scope of regulation.⁶¹

⁵⁵ *Id.* para. 34.

⁵⁶ *Id.*, dissenting statement of Chairman Hyde.

⁵⁷ *Id.*, separate statement of Commissioner Johnson.

⁵⁸ FCC Computer Inquiry, 7 F.C.C.2d 11 (Notice of Inquiry, 1966).

⁵⁹ D. DUNN ET AL., STANFORD RESEARCH INSTITUTE RESEARCH REPORT PREPARED FOR THE FEDERAL COMMUNICATIONS COMMISSION (FCC Docket No. 16979, 1969). See also Professor Dunn's article in this symposium, p. 369.

⁶⁰ Response of the Department of Justice, FCC Computer Inquiry.

⁶¹ For a further discussion, see Irwin, *The Computer Utility: A Public Policy Overview*, in SELECTED

E. A Critique of Regulatory Policy

The FCC deserves considerable praise because it has sought to accommodate the pressure for change with policies designed to promote greater flexibility in the market structure of domestic communications. To a large degree its efforts contrast sharply with those of the state commissions. As part of a philosophy of adaptation to technological change, FCC decisions reflect three general features. First, regulatory policy has not attempted to adhere rigorously to the natural monopoly concept. On the contrary, the Commission has been willing to recognize and utilize competitive pressures in the interest of enhancing industry performance. Second, although the Commission has expressed continuing concern over the potential for charging extortionate prices for the monopoly services, it has also emphasized the importance of consumer choice in promoting the public interest. In its decisions, the agency has given weight to the need to give consumers greater freedom as part of the rationale for removing interconnection restrictions and permitting new entry. Third, the FCC appears to be moving toward an implicit recognition of the survivorship hypothesis as a test for the existence of economies of scale in segments of the common carrier communications industry. These three elements of Commission policy are particularly remarkable in view of the fact that they evolved in a regulatory framework which is usually accused of being reactionary and unresponsive to change.

Despite these laudable efforts, a number of unresolved major problems confront the Commission. First, the Commission has been unable to formulate pricing guidelines after more than a decade of opportunity—even though the question of rate structure and rate levels for individual services is central to the development of adequate curbs on the abusive use of price as a barrier to entry and as a vehicle for cross-subsidization. Second, the Commission seems to be unable to develop a program for sponsoring contract research which is capable of producing workable guidelines or coming to grips with market structure problems. Commission-sponsored research studies have been isolated, slow in coming, and prone to treat topics at levels which are inconsequential in terms of their contribution to public policy formulation. Such special studies suffer, in part, because they are made on a case-by-case basis in different time periods. They may also be handicapped by the lack of expertise in telecommunications characteristic of recipients of such contracts. It becomes a major task to relate these studies to the current market structure, the objectives of regulation, and fragmentary statements of public policy. Third, the Commission has not been successful in developing tools for a benefit-cost analysis of the use of the radio frequency spectrum. Repeated suggestions for rationing the spectrum through the auctioning process may be inappropriate, but it remains for the Commission to establish suitable guidelines.

STRUCTURE AND ALLOCATION PROBLEMS IN THE REGULATED INDUSTRIES 1-18 (1969). *See also* Professor Irwin's article in this symposium, p. 360.

Finally, common carrier regulation still moves largely on a case-by-case basis. The division of responsibility between regulation on the one hand and the carriers on the other remains largely intact. Each issue continues to be considered in isolation, and there is very little evidence to suggest that unified policies and standards will be forthcoming in the reasonable future. Too often, pricing, interconnection, and other market structure variables are considered separately.

VI

A SUGGESTED SOLUTION: A SYSTEMS APPROACH TO COMMON CARRIER REGULATION

Clearly, what is needed is a systems approach to the regulation of the common carrier industry. Systems planning would seek to interrelate all variables pertaining to the common carrier service, as well as general communications, in such a fashion that they can be treated sequentially and cross-sectionally. Systems analysis must interrelate (1) the over-all system integrity of common carrier communications; (2) coexistence of monopoly and competition; (3) the need to assure an inducement to superior performance and freedom of consumer choice; and (4) efficient use of public resources.

The question of over-all system integrity must be considered at the outset. Theodore Vail was correct in referring to the importance of universal service as an ultimate goal for the public message network. The public message switched network is a system for interconnecting all customer terminals efficiently. An interdependent network involves consideration of three closely related issues: systemic integrity, system optimization, and service reliability. Systemic integrity involves the need for control over the quality of inputs to the network because the users or operators of one part of a communications grid can, by supplying it with improper or distorted signals, interfere with users throughout the entire system. System optimization involves planning for an integrated network in such a fashion that the development of separate segments is coordinated to avoid degrading performance and wasteful redundancy. Service reliability stems from the need to maintain technical integrity and the viability of the network.

Systemic integrity, optimization, and reliability cannot be achieved without a controlling force which provides a degree of nationwide planning in terms of standards and investment. An atomistic market structure would not achieve this objective alone. Three alternatives are available: (1) private monopoly organization; (2) government planning; and (3) collective action by all of the telephone common carriers.

The difficulty with relying on private monopoly organization is that responsibility for achieving over-all system integrity can no longer be blindly entrusted to AT&T or any of the carriers without sufficient safeguards to ensure that this concept will not be used as a device to foreclose new entrants and keep market structures rigid. Fur-

ther, public policy could not re-establish the era of the monopoly firm even if it wished to do so. This means that the Commission must seek to fulfill the over-all planning function for the entire system in the interest of promoting an integrated network which offers the consumer access to the largest total service universe. As an alternative to comprehensive Commission planning, it might be desirable to encourage collective planning by all of the common carriers, with Commission surveillance to insure that such an association permits all institutional forms of organization to coexist and that the restrictions which are ultimately imposed are determined by the Commission and are not designed to impede qualified competitive entrants.⁶²

A systems approach must also recognize the coexistence of monopoly, in the classic public utility pattern, and highly selective competition in particular submarkets. The problem will be to prevent extortionate rates in the provision of monopoly services. Such extortion is not simply a matter of high prices and adverse income distribution but also involves more subtle considerations. For example, depreciation charges for obsolete plant could be written off against the monopoly sector, while the competitive services enjoy the benefits of new technology through low prices. This would distort the incidence of the costs and benefits of technology. Similarly, prices could be set below long-run marginal cost, thereby permitting the monopoly service to subsidize the efforts of the carrier in highly competitive markets. These considerations require that the continued existence of monopoly be recognized and that suitable techniques be developed to curb cross-subsidization.

There are two general options. The first is to fix all common carrier prices at levels that are just and reasonable, whether the market is competitive or monopolistic. This appears to have been the general practice of the FCC. The second is to provide the carrier with greater latitude in the competitive markets, confining pricing freedom within a broad range, while moving vigorously to prevent the firm from shifting the burden of its mistakes in the competitive markets back to the monopolistic markets. This requires a different perspective from that which is currently considered feasible among regulatory agencies. The intent would be to regulate the monopoly sector strictly, giving considerable emphasis to the adequacy of the carrier's performance. This means that the firm must attain acceptable levels of technological advance and productivity gain in order to achieve target revenue requirements. The firm would be allowed to earn only this return in the monopoly sector, and strict constraints would be imposed on the carrier's ability to "shift back" losses, obsolete plant, redundant capacity, and so forth, to the monopoly segment of the enterprise. Thus, regulatory agencies would be compelled to specify desired levels of performance

⁶² The Trans-Canada Telephone System might be cited as an example of collective planning by common carriers. There are eight full members and one associate member of TCTS, representing both private and public ownership. TCTS assumes responsibility for maintaining a nationwide telephone network.

in monopoly markets and develop the techniques necessary to assure adherence to these targets. These "negative" inducements to superior performance would be complemented by the general pressures associated with rivalry in the competitive markets as well as by a program of incentive regulation at the over-all firm level.

The pressures for superior performance and freedom of consumer choice are again interrelated with over-all system integrity and a monopoly-competitive market structure. Regulation should not be a cloak for maintaining the status quo. Rather, successful regulation has a vested interest in maintaining flexibility and disequilibrium in the interests of encouraging innovation and change. One way to achieve this is for the agency to place greater reliance on selective competition and potential entry. This may be accomplished from several directions. The distinction between a service and facilities should be eliminated insofar as customers are concerned. The common carrier should be obligated to serve all comers with either a service or specific facilities, subject to minimum standards, upon payment of an appropriate price. This should apply whether the customer is a private line system, a potential entrant, or a traditional POTS (Plain Old Telephone Service) customer. Similarly, there should be relative freedom in delineating new markets and services. For example, the business of providing broadband services into the home and business markets should be accessible to CATV firms and other entrants as well as common carriers.⁶³ Indeed, competition at the terminal level may be a strong pressure for innovation and efficiency—particularly in the sense that it upsets monopoly in the exchange telephone market.

These competitive pressures can be consistent with the public interest if the regulatory agencies are able to establish broad limits and safeguards by (1) imposing a satisfactory system of user charges for the use of public resources such as the radio frequency spectrum; (2) requiring the customer to pay a bounty for conversion to established common carrier services in the event that the competitive entrant fails;⁶⁴ (3) providing advance assurance that public policy will not shield the new entrant any more than the established carrier from the actions of the marketplace; and (4) establishing satisfactory standards for interconnection and use of facilities—including the possible use of a fuse-type arrangement to sever service to terminal equipment which adversely affects other users.

As previously noted, all of the operations of the regulated firm should be consolidated and an adequate system of incentive regulation developed so that the inducement of the marketplace is applied to the amalgam of competitive and monopoly services in the interest of improved performance.⁶⁵

⁶³ The list of competitive points could be expanded by including factors such as unlimited Telpak sharing.

⁶⁴ This assumes that the common carrier does not have idle capacity and that it imposes a readiness-to-serve surcharge on customers who adversely affect the peak on relatively short notice.

⁶⁵ For an introduction to the problems of incentive regulation, see Trebing, *Toward an Incentive System of Regulation*, 72 PUB. UTIL. FOR. J., July 18, 1963, at 22.

On the other hand, a system of inducements requires that the common carrier be given greater freedom. This means freedom from a system of rigidly imposed full cost assignments to enable it to compete more effectively through imaginative pricing structures in the competitive markets. As an illustration, marginal cost pricing in off-peak periods should be employed so that the firm can achieve high load factors. Such efficient pricing benefits the monopoly market but also permits the carrier to provide interruptible service in competitive markets at attractive rates. Of course, some variant of peak responsibility cost assignments must be made to assure that no markets are served at less than long-run marginal cost and that all customers who contribute to the peak of the system share system-wide overhead costs in some reasonable proportion thereto. In addition, the carrier should be given greater freedom to utilize common facilities and plant through the development of new markets and services. For example, it would seem equitable to permit the Bell System to provide teleprocessing services in competition with service bureau companies if it wishes to make use of idle capacity in the electronic switching plant. Attention might even be given to a relaxation of the constraints imposed in the consent decree.

Finally, a systems approach requires consideration of a rationing mechanism that will assure reasonable utilization of public resources such as the radio frequency spectrum. A hopeful avenue may be the development of a reasonable procedure for applying shadow prices.⁶⁶

It is, of course, possible only to highlight the factors involved in a systems approach to communications regulation. What is needed is more experience. Perhaps this could best be achieved if Congress were to strengthen the budget of the Common Carrier Bureau of the FCC to facilitate a concerted program of experimentation. It would also seem desirable to have the state regulatory agencies, through the National Association of Regulatory Utility Commissioners, participate in this process. For the present, one can only hope that the silent crisis in domestic communications will choose to await such action.

⁶⁶ Shadow pricing is a device for allocating a resource among users by reference to the operation of a hypothetical market. For a further discussion of the use of shadow prices and frequency management, see COMMITTEE ON TELECOMMUNICATIONS, NATIONAL ACADEMY OF ENGINEERING, REPORTS ON SELECTED TOPICS IN TELECOMMUNICATIONS 49-64 (1968).