



Federal Communications Commission  
Office of Plans and Policy  
1919 M Street, N.W.  
Washington, D.C. 20554

A Working Paper on:

**4** Reforming Regulatory Policy  
for  
Private Line Telecommunications  
Services:  
Implications for Market  
Performance

December 1980

---

By: Jerry B. Duvall  
Michael D. Pelcovits

The FCC Office of Plans and Policy Working Paper Series presents staff research at various states of development. These papers are intended to stimulate discussion and critical comment both within the FCC as well as outside the agency on issues in contemporary telecommunications policy. Titles in the OPP Working Paper Series will include preliminary "think pieces," interim project progress reports, as well as completed research scheduled for publication on broadcasting, common carrier, cable, and other aspects of telecommunications regulation. The analyses and conclusions presented in the OPP Working Paper Series are those of the authors and do not necessarily reflect the views of other members of the Office of Plans and Policy, other Commission staff, or the Commission itself. Upon request, single copies of working papers will be provided as well as an updated list of current and proposed working paper titles. Given the preliminary character and tentative views contained in some titles in this series, it may be advisable to check with authors before quoting or referencing working paper titles in publications. Periodic public notices will announce additions to the Series.

Copies of the OPP Working Paper Series may be obtained from the Office of Public Affairs, Federal Communications Commission, Room 207, 1919 M Street, N.W., Washington, D.C. 20554, (202) 254-7674. Copies are also available for a fee from the Downtown Copy Center, 1114 21st Street, N.W., Washington, D.C. 20037, (202) 452-1422.

For information concerning the content of the OPP Working Paper Series, contact the Office of Plans and Policy, Federal Communications Commission, Room 838, 1919 M Street, N.W., Washington, D.C. 20554, (202) 653-5940. The Office of Plans and Policy will also have a limited number of copies available for distribution.

REFORMING REGULATORY POLICY FOR PRIVATE LINE  
TELECOMMUNICATIONS SERVICES: IMPLICATIONS FOR  
MARKET PERFORMANCE

Jerry B. Duvall and Michael D. Pelcovits \*/

December 1980

---

\*/Senior Staff Economists, Office of Plans and Policy, Federal Communications Commission. The views expressed are those of the authors and do not necessarily represent those of the Commission or its staff. The authors wish to thank Nina W. Cornell, Douglas W. Webbink, A. Daniel Kelley, James T. Brown, Boyd L. Nelson, Walter G. Bolter and Robert Preece for helpful comments and suggestions on various drafts of the paper. Special thanks are due Timothy K. Stevens of the FCC's Common Carrier Bureau for valuable insights that have been incorporated within the paper. The authors accept full responsibility, however, for any errors that remain.



## Table of Contents

	Page
I. Introduction.....	1
II. Rate Base Regulation and Economic Efficiency.....	2
A. Closed-Entry Models of Single-Output Natural Monopoly.....	3
B. Open-Entry Models of Multi-Output Natural Monopoly.....	6
C. Deregulation as an Alternative to Rate Base Regulation.....	10
III. The Dominant Firm and Market Performance.....	17
A. The Concept of Market-Specific Dominance.....	23
B. The Application of Market-Specific Dominance to Transitional Telecommunications Markets.....	24
IV. The Markets for MTS/WATS and PLS.....	28
V. The Problem of Inter-Service Cross-Subsidization.....	42
VI. Regulatory Policy for a Deregulated Private Line Market.....	48
VII. Concluding Observations.....	57



## I. INTRODUCTION

The 1980's will be a decade of transitional change for the domestic telecommunications industry. As a result of Federal Communications Commission (FCC) policies of the last dozen years, former monopoly interstate telecommunications markets have been opened to firms wishing to enter the industry. This open-entry market environment has forced the re-examination of federal regulation of the telecommunications industry. In particular, the continued application of Title II of the Communications Act of 1934 to all telecommunications firms of the 1980's raises difficult questions of equity and efficiency in a dynamic, open-entry industry. Until modern communications legislation is finally enacted, regulators must wrestle with the problem of applying regulation designed for monopoly markets to an industry that consists today of numerous large and small firms differing in both organization and technology from traditional telephone and telegraph companies.

This paper presents a regulatory proposal for transitional telecommunications markets with emphasis on AT&T's private line service (PLS) market. This paper assumes the continuation of the FCC's open-entry policies and attempts to deal with the role of rate of return regulation in a market environment that will become increasingly competitive during the 1980's. Section II of the paper briefly reviews some of the conceptual difficulties with rate of return or rate base regulation as discussed in the recent academic literature. Additionally, the removal of the rate of return constraint on AT&T's private line services is proposed as a way to avoid the possible economic distortions induced by rate base regulation, reduce the direct and indirect costs of regulation, and generally improve performance in the market for private line telecommunications services.

Since the proposed deregulation of AT&T's private line markets raises the possibility of dominant firm, anti-competitive conduct such as predatory pricing, Section III examines the economics of the multi-output dominant firm. The concept of market-specific dominance is developed and then applied in the subsequent analysis. Section IV characterizes in economic terms the current PLS and long distance interstate telecommunications message (MTS) markets. Following this discussion of the MTS and PLS markets, Section V briefly considers the regulatory problem of inter-service cross-subsidization. Section VI discusses the pricing behavior of a dominant firm in a deregulated market environment and considers policies designed to forestall predatory pricing. Finally, Section VII summarizes the argument of the paper.<sup>1/</sup>

## II. RATE BASE REGULATION AND ECONOMIC EFFICIENCY

In recent years rate base regulation of public utilities has been extensively re-examined by academic economists. This growing literature has identified various potential distortions in input usage, output levels, pricing, and other dimensions of regulated firm conduct resulting from the application of rate base regulation. Contributions to this literature can be roughly classified into two groups that reflect the order of historical development, viz., 1) closed-entry models of single-output natural monopoly and 2) open-entry models of multi-output natural monopoly. While this classification may not be appropriate for characterizing all contributions to the literature, it reflects nevertheless the different focus of the more recent literature as compared to the earlier contributions.

---

<sup>1/</sup>The legal implications of the proposal are not considered in this paper. The omission of legal analysis does not imply such considerations are unimportant or trivial. Rather, the economic analysis is presented without the complexity of legal arguments so that the economic logic can be sharply focused.

A. Closed-Entry Models of Single-Output Natural Monopoly

The pioneering paper of Averch and Johnson in 1962 established the beginnings of the formal, analytical study of the rate base regulated natural monopoly firm.<sup>2/</sup> The traditional view of natural monopoly based on economies of scale is implied.<sup>3/</sup> Given this traditional view of natural monopoly, potential entrants into the markets served by the regulated monopoly firm are barred by law. The rate base regulated monopoly firm is assumed to be a constrained profit-maximizer, producing a single, homogeneous output (say, "telecommunications service"). While the firm is constrained from earning full monopoly profits, its allowed rate of return is assumed to exceed its financial cost of capital. In terms of their static model, Averch and Johnson show that rate base regulation creates an incentive for the inefficient substitution of capital for labor that consequently distorts the input choices of the regulated firm away from production at minimum cost. Moreover, such regulation creates an incentive for the regulated firm to expand into other regulated markets, even if costs exceed revenues in those markets.<sup>4/</sup>

In addition to the input distortions induced by rate base regulation, Charles Needy shows that regulation may encourage the regulated firm to produce at non-optimal levels

---

<sup>2/</sup>Harvey Averch and Leland Johnson, "Behavior of the Firm Under Regulatory Constraint," American Economic Review 52 (December 1962):1053-69.

<sup>3/</sup>The traditional, single-output theory of natural monopoly is discussed by Alfred E. Kahn, The Economics of Regulation: Principles and Institutions, v. 1 (New York: John Wiley & Sons, 1970), pp. 11-12. The more recent literature, however, shows that economies of scale are neither necessary nor sufficient for natural monopoly, even in the single-output case. See William J. Baumol, "On the Proper Cost Tests for Natural Monopoly in a Multiproduct Industry," American Economic Review 67 (December 1977):809-22.

<sup>4/</sup>See Averch and Johnson, "Behavior of the Firm Under Regulatory Constraint," p. 1052.

of output.<sup>5/</sup> V. Kerry Smith suggests that regulation may distort the optimal direction of technological change<sup>6/</sup>, while Roger Sherman and Michael Visscher show that regulation may encourage price structures that do not maximize consumer welfare.<sup>7/</sup> Additionally, Elizabeth Bailey and Lawrence White demonstrate that rate of return regulation may promote pricing that both accentuates peak demand and encourages investment in peak capacity that is greater than socially optimal.<sup>8/</sup>

In general, these studies of regulation-induced distortions are developed in terms of static and comparative-static models.<sup>9/</sup> Dynamic analyses of the same regulatory problem sometimes qualify the unambiguous conclusions derived in terms of static economic models. For example, a dynamic Averch-Johnson model developed by Alvin Klevorick shows that the ". . . direction of the

---

<sup>5/</sup>Charles W. Needy, Regulation-Induced Distortions (Lexington, Mass.: D. C. Heath and Co., Lexington Books, 1975).

<sup>6/</sup>V. Kerry Smith, "The Implication of Regulation for Induced Technical Change," The Bell Journal of Economics and Management Science 5 (Autumn 1974):623-32.

<sup>7/</sup>Roger Sherman and Michael L. Visscher, "Rate-of-Regulation and Price Structure" in Problems in Public Utility Economics and Regulation, ed. Michael A. Crew (Lexington, Mass.: D. C. Heath and Co., Lexington Books, 1979), pp. 119-132.

<sup>8/</sup>Elizabeth E. Bailey and Lawrence J. White, "Reversals in Peak and Offpeak Prices," The Bell Journal of Economics and Management Science 5 (Spring 1974):75-95.

<sup>9/</sup>A rigorous, treatise-length discussion of various aspects of the effects of rate base regulation in terms of statics and comparative statics is provided by Elizabeth E. Bailey, Economic Theory of Regulatory Constraint (Lexington, Mass.: D. C. Heath and Co., 1973).

inefficiency is not as clear-cut as in the [basic] A-J model."<sup>10/</sup> As a further example, Wesley A. Magat's dynamic Averch-Johnson model of induced innovation challenges V. Kerry Smith's conclusion that rate base regulation will bias technological change toward capital-using innovations.<sup>11/</sup> One conclusion that can be drawn from these dynamic Averch-Johnson analyses is that the extent of economic distortions induced by rate base regulation should be investigated empirically.<sup>12/</sup>

In general, the literature that has followed the lead of the original Averch-Johnson contribution has focused on the static economic efficiency implications of rate of return regulation. This literature typically assumes that non-regulated firms are prohibited from entering markets served by the

---

<sup>10/</sup>Alvin K. Klevorick, "The Behavior of a Firm Subject to Stochastic Regulatory Review", The Bell Journal of Economics and Management Science 4 (Spring 1973):78.

<sup>11/</sup>Wesley A. Magat, "Regulation and the Rate and Direction of Induced Technical Change," The Bell Journal of Economics 7 (Autumn 1976):478-96.

<sup>12/</sup>Some empirical evidence concerning economic distortions that may be induced by RBR is beginning to accumulate. Evidence consistent with the static "Averch-Johnson effect" in the electric power industry is found by Robert M. Spann, "Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis," The Bell Journal of Economics and Management Science 5 (Spring 1974):38-52; Leon Courville, "Regulation and Efficiency in the Electric Utility Industry," The Bell Journal of Economics and Management Science 5 (Spring 1974):53-74; H. Craig Petersen, "An Empirical Test of Regulatory Effects," The Bell Journal of Economics and Management Science 6 (Spring 1975):111-26; and Paul M. Hayashi and John M. Trapani, "Rate of Return Regulation and the Regulated Firm's Choice of Capital-Labor Ratio: Further Empirical Evidence on the Averch-Johnson Model," Southern Economic Journal 42 (January 1976):384-98. Empirical evidence concerning the effect of rate base regulation on the direction of technological change in the Bell System is provided by Jerry B. Duvall, "The Induced Innovation Hypothesis and Biased Technological Change in the Domestic Telecommunications Industry: A Microeconomic Analysis," Dissertation Abstracts International 40 (August 1979):964-A.

regulated monopolist. Moreover, it is generally implicitly assumed that the administration of rate base regulation by real-world regulatory agencies is both costless and effective, although sometimes subject to "regulatory lag." Telecommunications, however, can no longer be characterized as a closed-entry industry in many of its interstate markets. Regulatory models that relax the assumption of closed-entry would seem both more realistic for modelling the telecommunications industry as well as more informative concerning possible public policy options. The more recent literature on the rate base regulated firm has in fact pursued the implications of an open-entry market environment.

B. Open-Entry Models of Multi-Output Natural Monopoly

Title II of the Communications Act of 1934 implicitly assumes that interstate telecommunications services will be provided by regulated monopoly telephone and telegraph firms. Today, neither AT&T nor Western Union are complete monopolists in the markets they supply. Instead, these former monopoly firms now share their markets with competitors. Moreover, modern telecommunications entities such as AT&T produce not just one generic service but a variety of differentiated telecommunications offerings. Consequently, the emergence of the modern telecommunications firm producing a variety of services in competition with recent market entrants poses regulatory difficulties not envisioned forty years ago. The more recent literature on the rate base regulated firm addresses both issues by assuming both that the regulated firm produces multiple outputs and may be subject to competition from new firms.

In terms of the recent literature, a natural monopoly is defined as a special type of industrial organization where a single, multi-product firm can produce the entire output of the industry more cheaply than a multiplicity of independent firms.<sup>13/</sup> If the cost function for a particular industry meets this condition for a natural monopoly, then the entry of additional firms in the industry would only increase the social cost of producing total industry output. Moreover, government barriers to entry may not be necessary to maintain the socially-optimal, cost-minimizing, natural monopoly market structure. If in response to the threat of competitive entry the regulated firm is permitted to set (Ramsey optimal) prices that maximize consumer welfare, then the natural monopolist may under certain assumptions be "sustainable," i.e., invulnerable to entry by competitors seeking simply to duplicate the services provided by the natural monopolist.<sup>14/</sup> If the regulated firm is not allowed such pricing freedom, then government restrictions on entry into the industry may be essential to avoid the waste of resources that would otherwise occur as potential entrants attempt to compete with the regulated natural monopoly firm.

---

<sup>13/</sup>More specifically, the cost function of a multi-output natural monopoly firm is strictly subadditive. A cost function  $C(y)$  is strictly subadditive at output vector  $y$  if  $\sum C(y^i) > C(y)$  for any set of vectors  $y^i > 0$  where  $\sum y^i = y$ . See Baumol, "On the Proper Cost Tests for Natural Monopoly in a Multiproduct Industry."

<sup>14/</sup>See William J. Baumol, Elizabeth E. Bailey, and Robert D. Willig, "Weak Invisible Hand Theorems on the Sustainability of Prices in a Multiproduct Monopoly," American Economic Review 67 (June 1977):350-365 and John C. Panzar and Robert D. Willig, "Free Entry and the Sustainability of Natural Monopoly," Bell Journal of Economics 8 (Spring 1977):1-22.

The new literature on multi-output natural monopoly and sustainability represents an important advance in economic theory. Its contemporary relevance to regulatory policymaking in the telecommunications industry may be limited, however. Sustainability theory in particular depends on simplifying assumptions that are not totally descriptive of the telecommunications industry. For example, sustainability theory typically assumes that potential entrants use the same technology as the natural monopoly firm to produce the same output. Firms that have entered the telecommunications industry in recent years, however, have offered services differing somewhat in quality from existing offerings and using somewhat different technologies.<sup>15/</sup> Additionally, sustainability theory is generally static in character while the impact of realized and potential market entry is inherently dynamic in nature.<sup>16/</sup> Apart from these theoretical limitations of sustainability theory, an empirical determination of cost function subadditivity is extremely

---

<sup>15/</sup>A theoretical study that considers the implications of open entry in a rate base regulated monopoly industry but under somewhat different assumptions than the sustainability literature is provided by Ronald R. Braeutigam, "The Regulation of Multiproduct Firms: Dimensions of Entry and Rate Structure," Studies in Industry Economics No. 65, Stanford University, 1976.

<sup>16/</sup>For further discussion of the difficulties of applying sustainability theory to real-world regulatory policymaking, see Vinson Snowberger, "Sustainability Theory: Its Implications for Governmental Preservation of a Regulated Monopoly," The Quarterly Review of Economics and Business 18 (Winter 1978):81-89.

difficult.<sup>17/</sup> In brief, the sustainability literature is still evolving and as yet is not sufficiently developed to address all complexities of regulatory policymaking for the telecommunications industry.<sup>18/</sup>

While significantly strengthening the theoretical foundation of regulated natural monopoly, the recent literature ignores important dimensions of the real-world practice of rate base regulation and the actual functioning of regulatory agencies. The interaction between the regulatory agency and the regulated industry may lead to the "capture" of the regulatory commission by the industry; delay the pace of economic development and growth of the regulated industry; retard the adoption of new technologies; and encourage

---

<sup>17/</sup>Sufficient conditions for subadditivity are established in Baumol, "On the Proper Cost Tests for Natural Monopoly in a Multiproduct Industry." An empirical study of cost function subadditivity is provided by W. J. Baumol and Y. - M. Braunstein, "Empirical Study of Scale Economies and Product Complementarity: The Case of Journal Publication," Journal of Political Economy 85 (October 1977): 1037-48. A methodology for guiding econometric work on multi-output cost function estimation is provided by W. J. Baumol, Dietrich Fischer, and M. I. Nadiri, "Forms for Empirical Cost Functions to Evaluate Efficiency of Industry Structure," Center for the Study of Business Regulation Paper No. 30, Duke University, 1978.

<sup>18/</sup>Recently, the focus of the sustainability literature has shifted toward the formulation of a general industrial organization paradigm stressing the relationship of technology-determined industry cost functions and the resulting market structure. The natural monopoly firm, therefore, is simply a "special case" in a more general industrial organization model. See W. J. Baumol and D. Fischer, "Cost Minimizing Number of Firms and Determination of Industry Structure," Quarterly Journal of Economics 92 (August 1978):439-67 and Robert D. Willig, "Multiproduct Technology and Market Structure," American Economic Review Papers and Proceedings 69 (May 1979):346-351.

litigation rather than the satisfaction of consumer needs.<sup>19/</sup> In brief, viewing the practice of rate base regulation more broadly as a dynamic institutional process and not primarily in terms of static equilibrium models highlights the limitations of both the Averch-Johnson and the more recent natural monopoly literature for guiding the formulation of telecommunications regulatory policy.

C. Deregulation as an Alternative to Rate Base Regulation

Given the possible incentives for distorted market performance as well as the substantial administrative costs of rate base regulation, some economists have strongly urged deregulation as an alternative to continued rate of return

---

<sup>19/</sup>For further analysis and criticism of regulation as an institutional process, see Bruce Owen and Ronald Braeutigam, The Regulation Game: Strategic Use of the Administrative Process (Cambridge, Mass.: Ballinger Publishing Co., 1978).

regulation of public utilities.<sup>20/</sup><sup>21/</sup> In the telecommunications industry, the entry of new firms during the 1970's in the markets for terminal equipment and specialized common carrier services expanded significantly the range of

---

<sup>20/</sup>See, for example, Nina W. Cornell, Daniel Kelley, and Peter R. Greenhalgh, "Social Objectives and Competition in Common Carrier Communications: Incompatible or Inseparable?", FCC Office of Plans and Policy Working Paper #1, April, 1980.

<sup>21/</sup>In recent years, deregulation of certain regulated industries has gained increasing support among economists as a policy option for improving market performance. By examining the economic impact of rules on market structure and firm conduct, economists are finding that some rules simply protect existing firms from competition while providing little or no benefit to consumers. Even worse, some rules impose substantial costs on both the regulated industry and consumers with no apparent benefit to anyone. The removal or modification of such costly, outmoded regulations clearly provides unambiguous gains in producer and consumer welfare. It must be emphasized, however, that simply removing rules that constrain firm behavior or restrict entry into an industry need not automatically lead to the emergence of a competitive industry, even after a substantial adjustment period. While deregulatory policy may not lead to a more competitive market structure and may prove unsatisfactory from an anti-trust perspective, market performance given the existing market structure can sometimes be improved by simply lifting restrictions that distort firm conduct. The regulatory reform proposed in this paper places emphasis on the importance of this latter view of deregulation.

consumer choice.<sup>22/</sup> Over the past decade the deregulatory policies of the FCC favoring open entry and competition in selected telecommunications markets have provided substantial consumer benefits while having little adverse effect

---

<sup>22/</sup>Some recent contributions to the literature on imperfect competition suggest that equilibrium in open entry markets with profit-maximizing firms represents a market-determined compromise among the extent of product diversity available to consumers, product price, and the realization of economies of scale. Moreover, this market-determined compromise may be shown to be inferior to a welfare optimum measured in terms of total consumer and producer surpluses. See, for example, Michael Spence, "Product Selection, Fixed Costs, and Monopolistic Competition," Review of Economic Studies 43 (1976):217-235. From such analysis an argument for regulation of market behavior and structure might be made. The experience gained during the 1960's and 1970's concerning government interference in markets to correct for "market failure" has prompted, however, a re-examination of the efficacy of such government policies. In other words, the alternative to market failure--government interference--may be the greater of two evils. Some writers now argue that "government failure" in attempting to correct for market failure often produces a greater social problem than the welfare losses resulting from deficiencies in the functioning of particular markets. See, for example, the provocative discussion by Roland Vaubel, "Repairing Capitalism," Regulation: AEI Journal on Government and Society 4 (July/August 1980):12-16. Moreover, some economists argue that "monopoly bureaucracies" established to deal with particular instances of market failure have an incentive to produce excessive, non-optimal levels of government service, i.e., the social mechanism for correction of the market mechanism may itself be inherently wasteful. See the analysis developed by William A. Niskanen, Jr., Bureaucracy and Representative Government (Chicago: Aldine-Atherton, 1971). Apart from socially non-optimal bureaucratic incentives, regulatory agencies in particular face enormous political and informational difficulties in the administration of regulatory processes. Given these inherent difficulties, it is not surprising that regulatory intervention in markets is costly. For a recent discussion of regulatory costs and estimates of such costs, see Murray L. Weidenbaum, "Government-Mandated Inflation" in Economic Effects of Government-Mandated Costs, ed. Robert F. Lanzillotti (Gainesville, Florida: University Presses of Florida, 1978), pp. 3-22. The net increase in consumer welfare after imposing regulation and deducting its costs may be negative. Both the lessons of recent experience as well as contemporary economic analysis suggest that the social decision to intervene in markets should carefully consider the full, long-term consequences of possible government failure that may be the unfortunate outcome of well-intentioned social policy.

on the established firms in the telecommunications industry.<sup>23/</sup>

As the telecommunications industry evolves toward a more competitive market structure, the continuation and uncritical acceptance of rate of return regulation of dominant firms in the industry should be reconsidered. One approach to the problems associated with rate base regulation of dominant firms is to eliminate regulation in one "flash-cut."<sup>24/</sup> While enactment of this policy may reduce some of the transition costs in achieving total deregulation, it may also impose an unnecessary risk that poor initial market performance will provoke a return to rate base regulation. An alternative approach that would prolong the transition period to deregulation but reduce the risk associated with that policy would be the gradual removal of rate base regulation and other controls from the various markets served by the dominant firm. Rate base regulation would be removed from markets as actual and potential competition develops. Other regulatory controls would be maintained for a longer period of time to deter anticompetitive activities of the

---

<sup>23/</sup>This conclusion was reached in the recent Second Report in FCC Docket 20003. The issuance of this report terminated this inquiry that considered the economic impact of new competition in terminal equipment and specialized common carrier markets on the established common carriers.

<sup>24/</sup>This view is reflected, for example, in Alfred E. Kahn, "Applications of Economics to an Imperfect World," American Economic Review Papers and Proceedings 69 (May 1979):1-13.

dominant firm. As the deregulatory plan unfolds, market performance could be reevaluated to gauge whether further steps should be taken.<sup>25/</sup>

This paper suggests implementing gradual deregulation by removing the rate of return constraint on AT&T's private line services (PLS). To implement this objective, investment in private line plant and equipment would be removed from AT&T's interstate rate base. Other regulatory requirements, however, would continue to apply to AT&T's private line services. Thus, AT&T would still be required to file private line tariffs, although such tariffs

---

<sup>25/</sup>This gradualist approach to deregulation is similar to Markham's case-by-case approach to workable competition. Following Markham, a market is "workably competitive" if there is no policy change that would lead to significant improvement in market performance. See J. W. Markham, "An Alternative Approach to the Concept of Workable Competition," American Economic Review 40 (June 1950):349-61. As argued in this paper, partial deregulation of the PLS market would provide incentives for improved market performance. In recent years, pessimism concerning prescriptive welfare judgments induced by Lipsey and Lancaster's theory of the "second best" has given way to guarded optimism. Increasingly, economists are willing to search for welfare gains on a market-by-market basis, rather than establishing rigorous criteria for global welfare gains over many markets. Reflective of this approach is Arnold C. Harberger, "Three Basic Postulates for Applied Welfare Economics: An Interpretive Essay," Journal of Economic Literature 9 (September 1971):785-97. Applied "piecemeal" welfare economics depends heavily, however, on the notion of consumers' surplus. Fortunately, Robert Willig has done much to improve the conceptual basis for making welfare assessments based on this concept. See Robert D. Willig, Welfare Analysis of Policies Affecting Prices and Products (New York: Garland Publishing, Inc., 1979). Recent work by Williamson illustrates the trend toward the piecemeal approach for formulating welfare-increasing policies. See, for example, O. E. Williamson, "Economies as an Anti-trust Defense: The Welfare Trade-offs," American Economic Review 68 (March 1968):18-36.

would not require cost support justification.<sup>26/</sup> In a newly deregulated market, tariffs will provide an important information function that will help prevent anti-competitive price discrimination or discriminatory access to facilities. Applications to build new plants as presently required by Section 214 of the Communications Act of 1934 would also be required.<sup>27/</sup> In short, only the rate-of-return constraint on private line services would be relaxed;<sup>28/</sup> other common carrier regulatory practices would continue for the present. By contrast, MTS/WATS would continue to be regulated consistent with Title II of the Communications Act of 1934. The performance of the PLS market would be "monitored" by the FCC subsequent to the removal of the rate-of-

---

<sup>26/</sup>Such tariffs should be simplified, consistent, and unbundled. The revision of AT&T's private line tariffs is presently the subject of CC Docket 79-246. See Notice of Inquiry and Proposed Rulemaking in the Matter of AT&T Private Line Rate Structure and Volume Discount Practices released October 17, 1979.

<sup>27/</sup>Although investment allocated to interstate PLS would be removed from AT&T's interstate rate base, retention of Section 214 authority over capacity-expanding investment would facilitate the detection of possible PLS "predatory investment" by AT&T. This point is discussed in more detail in the following sections of the paper.

<sup>28/</sup>A major simplification in the cost justification of private line services is proposed in CC Docket 79-245. See Notice of Proposed Rulemaking in the Matter of AT&T Manual and Procedures for the Allocation of Costs released June 26, 1980. This Notice proposes to require only that the aggregate of all private line service earn the allowed rate of return.

return constraint. If performance appears satisfactory, remaining regulatory constraints could be relaxed.<sup>29/</sup>

---

<sup>29/</sup>The proposed regulatory reform discussed in this paper is not entirely new. In 1968, Professor Harold Wein of Michigan State University proposed, as a consultant to the FCC in Docket 16258, that

. . . the rate level for MTT (now MTS) services as a whole be determined on the basis of the average cost of these services, plus a fair rate of return. Since much plant of these services is used in common with other services, its costs must be obtained by allocation methods. These methods can be improved through more careful sampling procedures and more precise definition of usage. . . .

Concerning AT&T's competitive, interstate PLS services, Wein recommended that

. . . Bell management be given the option of pricing the other (i.e., competitive) services at such levels as they deem appropriate to meet competitive conditions. If the rates chosen for these services, together with the fair rate of return on MTT services, do not yield a fair rate of return on total interstate plant, the deficiency should be borne by the AT&T stockholders. If the rates chosen by AT&T management for those other competitive services, together with the fair rate of return on the MTT services yield a return that exceeds the fair rate of return for the total interstate plant, the benefit will accrue to the company's stockholders.

See "Testimony of Harold H. Wein," Docket 16258, FCC Staff Exhibit 50, July 22, 1968, p. 169. While Wein's policy recommendations overlap in part with those developed in this paper, the theoretical perspective developed here differs substantially from Wein's testimony.

The thrust of this modest deregulatory proposal seeks to eliminate both the static and dynamic economic inefficiencies that rate of return regulation may induce.<sup>30/</sup> The administrative costs of rate base regulation as it pertains to AT&T's private line services would also be reduced. Moreover, rate base regulation could no longer serve to protect AT&T's PLS competitors if in fact they operate less efficiently than AT&T. In short, the deregulatory proposal of this paper would promote economic efficiency in the private line services market, reduce the cost of regulation, and provide a profit incentive for accelerated innovation in private line services.

### III. THE DOMINANT FIRM AND MARKET PERFORMANCE

Few real-world markets literally consist of either a single firm supplier (a monopoly) or so many firms that no single producer individually can influence market price (pure competition). The market models of monopoly and pure competition are essentially theoretical polar cases that sharply focus attention on the conditions that influence market performance. Thus, a single seller of a single output can establish a market price in excess of the

---

<sup>30/</sup>Constraining a profit-maximizing firm to earn a rate of return no greater than the firm's financial cost of capital may discourage the risk-taking that accompanies innovative behavior. With no financial incentive in the form of supranormal profits to spur innovation, the regulated firm may pursue relatively risk-averse investment strategies that delay the adoption of product and process innovations. See, for example, the discussion in William G. Shepherd, "The Competitive Margin in Communications" in Technological Change in Regulated Industries, ed. William M. Capron (Washington, D.C.: The Brookings Institution, 1971), pp. 117-118. While "regulatory lag" may provide some stimulus to risk-taking by permitting the rate of return to exceed the cost of capital for awhile, this incentive may be relatively ineffectual if inflation pushes the regulated firm's financial cost of capital above the allowed rate of return for extended periods of time.

marginal cost of production and thereby restrict output to socially-inefficient levels. As the number of firms in a given market increases from one to "many" similar-sized entities, the monopoly power of a single seller is diluted, output approaches socially-efficient levels, and market price falls toward the marginal cost of production.<sup>31/</sup> The behavior of real-world markets falls somewhere along a continuum between these polar cases.

---

<sup>31/</sup>More precisely, it is not simply the increased numbers of firms that improve market performance. With the exception of the Cournot model that directly links the number of firms in an industry to competitive market performance, assumptions concerning the nature and extent of firm interdependence in decision-making affect performance in a given market. The literature on oligopoly models shows clearly how different behavioral assumptions concerning firm reactions to rival's pricing and output policies influence market outcomes. In particular, models of market behavior based on game theory are beginning to receive emphasis in the applied rather than just in the theoretical literature. See, for example, Leslie Hannah and J. A. Kay, Concentration in Modern Industry (London: Macmillan Press Ltd., 1977). The analysis of probable AT&T pricing behavior of PLS following deregulation is considered later in this paper and explicitly considers the role of dominant firm behavior vis à vis fringe competitors.

The concept of a dominant firm is a useful, operational way to characterize a real-world business firm that has the potential "market power" to behave more like a monopolist than a perfect competitor.<sup>32/</sup> The concept may suggest not only the relative "fewness" of firms in a given market but also more importantly the unequal size (market share) of the dominant firm compared to its competitors. As an indicator of dominance, Scherer defines a dominant firm as one controlling roughly 40% or more of the industry's

---

<sup>32/</sup>The concept of "market" or "monopoly power" is not consistently defined in the general economics literature. Rather, the concept is most often encountered in the literature on antitrust law. See, for example, Ernest Gellhorn, Antitrust Law and Economics in a Nutshell (St. Paul, Minn.: West Publishing Co., 1976), Chapter IV. In most real-world markets, market power is a matter of degree, since individual firms possess some influence over output price. Thus, even retailers in imperfectly competitive markets have some market power, i.e., such firms have some leeway in setting prices. Such a firm will lose some but not all its customers if it raises its prices. In such a market, such monopolistically-competitive firms might be described as "price-searchers," since they search for a price that is most consistent with the firm's objective, e.g., profit-maximization. Contrary to the assumption of perfect or costless information in the model of perfect competition, real-world firms possessing some market power must sometimes experiment or search for the price that maximizes profit or some alternative business goals. The exercise of this limited market power must sometimes of obtaining necessary market information. In general, the exercise of such limited market power does not represent a serious threat to consumer welfare. The exercise of market power by a firm possessing "market-specific dominance" as discussed later in the text will be inimical to consumer welfare and connotes a broader social concern, viz., the ability of the firm to keep prices high, earn supranormal profits, and still exclude competitors. See Franklin M. Fisher, "Diagnosing Monopoly," The Quarterly Review of Economics and Business, 19 (Summer 1979):7-33. From Fisher's point of view, the ". . . correct analysis of entry or barriers to entry lies at the heart of an assessment of monopoly power." See *ibid.*, p. 23. The analysis of regulatory policy for transitional telecommunications markets as developed in this paper is broadly consistent with Fisher's view of monopoly power. Moreover, this analysis emphasizes the importance of open entry policies as constraints on the exercise of discretionary market conduct by firms dominant in a specific market.

output.<sup>33/</sup> In one textbook classification, the dominant firm falls between a pure monopoly and a "tight oligopoly" where the latter functions as if it were a "shared monopoly."<sup>34/</sup>

While the notion of a dominant firm as an empirical concept is not entirely clear-cut, most industrial organization textbooks hypothesize a causal relationship between a firm's dominance in the market and market performance.<sup>35/</sup> Firm dominance as an attribute of market structure usually implies that the firm has sufficient market power to influence product price (among other dimensions of seller conduct) such that market performance is

---

<sup>33/</sup>F. M. Scherer, Industrial Market Structure and Economic Performance, 2d ed. (Chicago: Rand McNally, 1980), p. 232. Alternatively, Williamson requires that a dominant firm exceed a 60% market share and that barriers to entry to the market are "great". See Oliver E. Williamson, Markets and Hierarchies: Analysis and Antitrust Implications (New York: The Free Press, 1975), p. 209.

<sup>34/</sup>William G. Shepherd, The Economics of Industrial Organization (Englewood Cliffs, N.J.: Prentice-Hall, 1979), pp. 62-63.

<sup>35/</sup>Market "performance" as used in this paper follows the standard "structure-conduct-performance" paradigm of the industrial organization literature. The various dimensions of market performance usually include static and dynamic economic efficiency, consideration of equity, and certain macroeconomic objectives. For a complete discussion of this model for industrial organization studies, see F. M. Scherer, Industrial Market Structure and Economic Performance, 2d ed. (Chicago: Rand McNally, 1980), Chapter 1. A recent criticism of this standard paradigm from an "Austrian" perspective is provided by W. Duncan Reekie, Industry, Prices and Markets (New York: John Wiley & Sons, 1979). The views expressed in this paper are sympathetic with Reekie's criticisms of the application of static neoclassical economics. More specifically, this paper emphasizes the importance of dynamic efficiency in assessing market performance and the disequilibrium characteristics of most real-world markets.

directly affected.<sup>36/</sup> From the consumer's viewpoint, it is market performance rather than market structure per se that matters.<sup>37/</sup> While in general more competitive market structures may imply better market performance, the relationship between structure and performance is often complex and

---

<sup>36/</sup>For example, the general industrial organization literature on pricing behavior in oligopoly markets frequently hypothesizes that the excess of price over cost is a direct function of the degree of concentration. For example, Cowling and Waterson derive the static relationship  $(px - \sum c_i x_i)/px = H/\mu$  where  $px$  measures aggregate industry revenues;  $c_i x_i$  measures total cost for firm  $i$ ;  $H$  represents the Herfindahl index of concentration; and  $\mu$  measures the market elasticity of demand. Assuming a homogeneous product and an oligopoly market structure, the Cowling-Waterson relationship shows that the average price-cost margin in the industry is positively and directly related to the extent of industry concentration as measured by  $H$  (where its reciprocal may be conceived as measuring the equivalent number of equal-sized firms in the industry) and inversely proportional to the elasticity of market demand,  $\mu$ . For further discussion, see K. G. Cowling and M. Waterson, "Price-cost Margins and Market Structure," *Economica* 43 (1976):267-74 or the brief discussion in Hannah and Kay, *Concentration in Modern Industry*, Chapter 2. Of course, admitting the possibility of differentiated products, the role of collusive and other strategic behavior, as well as the possible behavioral differences between a dominant and oligopoly firm weakens the relevance of static price-cost/concentration relationships to the regulatory analysis of this paper. Pricing issues as they relate to the regulatory reform proposed in this paper are discussed in Section VI.

<sup>37/</sup>The industrial organization literature is often characterized in terms of a "structuralist" vs. "behaviorist" viewpoints. The structuralist approach emphasizes direct empirical links between market structure and performance while the behaviorist approach emphasizes the importance of intervening conduct variables as well as structural variables in explaining market performance. The work of Joe S. Bain is usually cited as reflecting the structuralist viewpoint. See Joe S. Bain, *Industrial Organization* (New York: John Wiley, 1959). The behaviorist or so-called "neo-Chicago school" viewpoint is clearly reflected in George J. Stigler, *The Organization of Industry* (Homewood, Illinois: Richard D. Irwin, 1968). The work of F. M. Scherer, *op. cit.*, while eclectic in approach nevertheless reflects a behaviorist orientation. This paper reflects more a behaviorist than a structuralist orientation. Regardless how the viewpoint of this paper may be characterized, the emphasis for policy purposes is on market outcomes rather than the possible causal or environmental factors at work. If market performance is acceptable, then neither conduct regulation nor structural changes are required from a public policy viewpoint.

imprecise.<sup>38/</sup> Furthermore, there is sometimes a tendency to focus on market structure as a policy objective itself apart from the implications for good market performance. Stigler, however, has observed that

In economic life competition is not a goal: it is a means of organizing economic activity to achieve a goal. The economic role of competition is to discipline the various participants in economic life to provide their goods and services skilfully and cheaply.<sup>39/</sup>

The discussion of this paper reflects a fundamental concern for good market performance. Market structure is considered satisfactory or socially-acceptable if the market performs well.

---

<sup>38/</sup>Furthermore, the relationship may be subject to important exceptions. For example, a "natural monopoly" may under very special conditions achieve better market performance than a more competitive industry. As discussed previously, the theoretical requirements necessary for this conclusion, however, are very restrictive and may not be satisfied in real-world markets. Also, the recent literature on information cost and market transactions significantly qualifies the standard conclusions concerning the optimality of pure competition. The role of information cost and consumer search behavior on market performance is discussed later in the paper.

<sup>39/</sup>Stigler, The Organization of Industry, p. 5.

A. The Concept of Market-Specific Dominance

Implicit in most definitions of a dominant firm is the assumption that the firm sells a single product or service that, from the buyer's viewpoint, resembles in most important respects the output of other competing firms in the industry. In many cases, however, real-world firms produce multiple, heterogeneous outputs rather than a single, homogeneous product or service. Moreover, the markets for the individual products or services of a multi-output firm may differ sharply in terms of structure and conduct. Consequently, the concept of a dominant firm should be market-specific; the firm may be dominant in one or several of its output markets but possibly non-dominant in others.<sup>40/</sup> The notion of market-specific dominance emphasizes the importance of both demand and supply in assessing market performance. By contrast, conventional concepts of dominance are implicitly firm-specific and supply-oriented, i.e., such concepts emphasize the quantity of output supplied to the market by a particular firm while placing less emphasis on the characteristics of market demand. The significance of the market-specific dominance concept is that it shifts the focus of regulatory policy away from the dominant firm as an aggregate corporate or organizational entity per se and toward the conduct of the firm in a specific market. If performance in a particular market is satisfactory and can be reasonably expected to remain so, then there is little justification for regulatory intervention even if the firm is defined as dominant in a supply-oriented sense of the term.

---

<sup>40/</sup>The concept of market-specific dominance introduced here parallels recent theoretical analyses of natural monopoly discussed in Section II. While the terminology "market-specific dominance" may be novel, the approach itself is implicit in many anti-trust analyses of market conduct and structure. The application of these concepts to regulatory policymaking, however, is unique. Moreover, since the effects of rate base regulation are not similar to those of conventional anti-trust remedies, the analysis must be appropriately modified.

B. The Application of Market-Specific Dominance to Transitional  
Telecommunications Markets

To make the notion of market-specific dominance operational requires a working definition of a market for a particular good or service. Developing such a working definition may be difficult. Indeed, much of the anti-trust literature on mergers hinges on defining relevant markets.<sup>41/</sup> Nevertheless, economic theory provides useful guidelines for defining the boundaries of real-world markets. For example, Joan Robinson's theoretical notion of an industry as a group of firms producing a single commodity ". . . where a commodity in the real world is bounded on all sides by a marked gap between itself and its closest substitutes. . ." <sup>42/</sup> captures the essential idea of a well-defined market for a particular commodity.

Applying Robinson's notion of an industry to real-world markets is extremely difficult, however. More recently, some economic theorists have begun to emphasize the properties of goods rather than consumer preferences as the appropriate conceptual foundation for consumer demand.<sup>43/</sup> This more recent approach seems especially helpful in defining market boundaries for technical services such as private line communications that possess specific,

---

<sup>41/</sup>For further discussion, see Scherer, Industrial Market Structure and Economic Performance, Chapter 20.

<sup>42/</sup>Joan Robinson, The Economics of Imperfect Competition (London: Macmillan, 1933), p. 17.

<sup>43/</sup>Kelvin Lancaster has emphasized this approach in recent years, although the genesis of such thought can be traced to Menger and Chamberlin and applied in the 1950's by Theil, Houthakker, and others. See Kelvin J. Lancaster, "A New Approach to Consumer Theory," Journal of Political Economy 74 (April 1966):132-57. A complete exposition is given by Kelvin Lancaster, Consumer Demand: A New Approach (New York: Columbia University Press, 1971).

measurable characteristics in fixed proportions.<sup>44/</sup> For example, the demand for a specific private line service could be defined in terms of several technical and economic characteristics such as switched or non-switched

---

<sup>44/</sup>The traditional approach for defining a market as followed in the industrial organization literature emphasizes the extent of product substitution among similar commodities as well as the extent of possible supply-side input substitution in production. In many studies demand side product substitution is emphasized and, in more technical terms, is conceived and measured in terms of "goods space." Consequently, market boundaries are often drawn arbitrarily in terms of a qualitative assessment of the probable degree of substitution among various similar commodities. Sometimes an attempt is made to quantify the extent of substitutability by estimating a coefficient of cross elasticity of demand. In either event, traditional qualitative and quantitative approaches raise numerous conceptual and measurement problems that often lead to excessively broad or narrow market definitions for commodities comprising an industry. These difficult problems are clearly discussed by Scherer, Industrial Market Structure and Economic Performance, pp. 59-64. In addition, the history of anti-trust litigation suggests that courts sometimes appear to delineate market boundaries in such a way to justify a desired outcome. See, for example, the discussion in Scherer, Chapter 20.

A major advantage of Lancaster's reformulation of demand theory is the definition of a good or service in terms of "characteristics space" rather than goods space of traditional theory. In technical terms, the fundamental relationship between a vector of characteristics,  $z$ , and a vector of goods,  $x$ , is given by  $z = Bx$ , where  $B$  is a semipositive matrix describing the "consumption technology." If  $r$  and  $n$  indicate the number of distinct characteristics and goods respectively, then  $B$  is order  $r \times n$  where, generally,  $r < n$ , although not necessarily. If the consumption technology matrix  $B$  is square and diagonal, then the traditional theory of the consumer is just a special case of Lancaster's model such that a single, unique characteristic is associated with each good. Having defined a good in terms of characteristics, a Lancasterian definition of a commodity "group" or "industry" follows naturally: an industry is defined in terms of the  $B$  matrix. If the  $B$  matrix is block triangular such that matrices  $B_1$ ,  $B_2$ , and  $B_3$ , form the principal diagonal with null matrices elsewhere, an industry can be defined in terms of the block of coefficients that form  $B_1$ ,  $B_2$ , and  $B_3$ . The block of coefficients represented by, say,  $B_1$  define a product group or industry that share specific characteristics in common, i.e., commodity attributes not shared by any other product. While this approach to market definition appears abstract, it provides a conceptual foundation for developing relatively clear-cut market boundaries in terms of observable product attributes. Lancaster's approach offers a powerful alternative to the traditional market boundary methodology. For further discussion, see Lancaster, Consumer Demand, Chapter 8. A brief but clear discussion is also provided by Donald A. Hay and Derek J. Morris, Industrial Economics: Theory and Evidence (Oxford: Oxford University Press, 1979), pp. 88-92.

service, digital or analog, or other defining attributes of the service. While sometimes difficult in practice, real-world markets can be delineated in terms of Lancasterian characteristics. Markets viewed in this way are appropriate for assessing the extent of market-specific dominance.

The notion of market-specific dominance as discussed so far is unnecessarily static in nature, i.e., the market is examined in terms of existing substitute commodities with similar characteristics. A forward-looking perspective, however, is more useful for evaluating both the present as well as future performance of the market. In assessing market-specific dominance for a particular firm as a factor explaining or influencing market performance, some recognition of potential entrants is essential. Such a forward-looking emphasis is not new; J. B. Clark, for example, emphasized the importance of "potential competition" as a factor influencing the conduct of dominant firms. More recently, John Panzar in developing his notion of "structurally contestable" markets has noted that

Efficient market performance is expected to result from the large number of potential entrants and the easy entry and exit dictated by the technology, in other words, because the market is easily contested.<sup>45/</sup>

---

<sup>45/</sup>John C. Panzar, "Regulation, Deregulation, and Economic Efficiency: The Case of the CAB," American Economic Review Papers and Proceedings 70 (May 1980):311.

Panzar's notion of contestable markets implies that entry will tend to be excessive rather than insufficient.<sup>46/</sup> In short, assessing the extent of market-specific dominance must recognize both the influence of existing as well as potential entrants in the market.

In brief, the concept of market-specific dominance as a conceptual framework for evaluating market performance recognizes the multi-output character of most real-world firms; emphasizes the importance of potential entrants as a dynamic influence affecting firm conduct; and explicitly recognizes the importance of structural characteristics of market demand as factors influencing market performance. The concept of market-specific dominance focuses attention on the performance of a dominant firm in a particular market and de-emphasizes the public policy consequences of supply-side, firm-specific dominance as viewed in the aggregate over all markets served by the firm. As an approach to regulatory policy, market-specific dominance stresses the importance of performance in individual markets served by the firm rather than the firm per se as the focal point of regulatory policy-making.

---

<sup>46/</sup>Ibid., p. 314.

#### IV. THE MARKETS FOR MTS/WATS AND PLS

At present there are significant structural differences between the MTS/WATS and PLS markets that may imply significant differences in market performance if the rate-of-return constraint is relaxed.<sup>47/</sup> First, the size of the current PLS market is substantially smaller in sales volume as compared to the MTS/WATS market.<sup>48/</sup> Table 1 presents data on total annual Bell System interstate MTS, WATS, and toll PLS revenues for the years 1972-1979 as reported on year-end Report No. 4 (Bell System Operating Revenues) filed monthly with the FCC.<sup>49/</sup> As the data for 1979 suggest, the combined revenues for MTS and WATS are nearly ten times that of PLS. Second, the PLS market, in sharp contrast to the MTS/WATS market, consists of a variety of individual PLS services, with each service as presently tariffed appearing to have somewhat different technical characteristics. Table 2 shows the total annual interstate revenues for each Bell System private line service as reported on Monthly Report No. 4 for the years 1972-1979. (The column totals in Table 2 are the data reported in column four in Table 1.) Table 2 shows

---

<sup>47/</sup>The existing structural differences between the MTS/WATS and PLS markets are, however, highly time-specific. If present technological and competitive trends continue, the structural differences between the MTS/WATS and PLS markets may eventually become unimportant. At that point total RBR deregulation of AT&T may be desirable.

<sup>48/</sup>The FCC decision in Docket 21402 found that MTS and WATS to be "like" services. Whether MTS and WATS might be considered separate markets in terms of the market boundary analysis of Section IV is not determined, however, in this paper.

<sup>49/</sup>More comprehensive data including interstate revenues for non-Bell carriers are not conveniently available. Nevertheless, more inclusive data would not significantly alter the relative orders of magnitude shown in the table.

TABLE 1  
TOTAL BELL SYSTEM INTERSTATE DOMESTIC MTS, WATS, AND TOLL PLS REVENUES,  
1972-1979  
(\$000)

Year	MTS	WATS	PLS
1972	4,974,274	537,009	812,148
1973	5,719,227	687,149	863,305
1974	6,198,526	835,059	889,773
1975	6,875,350	1,016,915	957,006
1976	7,698,500	1,324,271	1,026,186
1977	8,480,751	1,644,891	1,079,234
1978	9,629,651	1,961,783	1,224,080
1979	10,827,411	2,254,521	1,396,398

SOURCE: Monthly Report No. 4 (Bell System Operating Revenues) filed with the FCC.

TABLE 2  
TOTAL BELL SYSTEM INTERSTATE TOLL PLUS  
REVENUES BY SERVICE, 1972-1979  
(\$000)

Service	Year							
	1972	1973	1974	1975	1976	1977	1978	1979
Interstate Toll								
Private Line Service								
Telephone	229,622	257,695	250,580	262,573	293,578	329,969	393,620	450,537
Teletypewriter	79,392	69,203	60,861	56,729	54,110	45,138	38,571	32,940
DATA-PHONE Digital Service	-	-	-	771	4,926	12,659	21,574	40,257
Other Telegraph	2,761	2,781	2,764	2,675	2,988	3,030	3,150	3,110
Telephone Grade	(2)	16	(4)	146	33	29	36	56
Telegraph Grade								
Multipurpose Widenband								
TELPAK	320,756	341,598	375,242	414,283	428,929	426,128	416,551	441,360
Other	13,423	14,564	15,216	13,579	11,071	6,280	5,683	5,570
Program Transmission								
Audio	17,275	17,381	17,184	18,120	17,676	18,549	20,075	22,250
Television	73,499	63,909	59,492	58,381	58,186	54,807	57,670	58,631
Other Services								
Telephone Grade	68,220	87,614	99,990	121,567	144,843	178,940	263,910	35,010
Telegraph Grade	7,202	8,544	8,451	8,182	9,845	3,706	3,197	2,933
Total <sup>1</sup>	812,148	863,305	889,773	957,006	1,026,186	1,079,234	1,224,080	1,496,325

<sup>1</sup> Totals may differ from sum of reported line amounts due to rounding.

( ) indicates negative "adjusting entries"

that the bulk of Bell System interstate PLS revenues are derived from point-to-point dedicated telephone PLS, TELPAK, and, more recently, other telephone grade private line service.<sup>50/</sup>

For the specialized common carriers (SCC) that now compete with the Bell System in the PLS market, there is no statistical report directly comparable to the Bell System Report No. 4. FCC Form P (Annual Report of Miscellaneous Common Carriers) provides some data, however, that helps establish the relative significance of SCC revenues vis a vis the Bell System. Table 3 provides total SCC revenues for the period 1975-1979 as reported by Form P.<sup>51/</sup>  
<sup>52/</sup>. The second column of Table 4 shows total SCC revenues as reported in Table 3 as a percentage of Bell System interstate PLS revenues reported in Table 2. The third column shows the same computation including intrastate Bell System PLS revenues. Both computations show the growth in SCC revenues

---

<sup>50/</sup>TELPAK is a "discount" private line service intended for large-volume communications between specified points. The service provides communication links for voice, data, facsimile, and signaling.

<sup>51/</sup>The service categories are those specified by Form P and are not directly comparable to the interstate revenue categories in Monthly Report No. 4 for the Bell System as reported in Table 2. The carriers included in the determination of total SCC revenues in Table 3 vary somewhat over the period 1975-79 as new firms entered the industry. The carriers included in the revenue compilation of Table 3 are MCI, Inc., MCI Telecommunications Company, N-Triple-C, Inc., Southern Pacific Communications Co., Transportation Microwave, Western Telecommunications, Inc., and Business Telecommunications. While these firms do not exhaust the number of entities in the SCC industry, the firms included generated the bulk of SCC industry revenues over the period 1975-79.

<sup>52/</sup>Form P does not disaggregate SCC revenues by interstate and intrastate jurisdictions. Also, the "Shared/Switched Voice Grade" revenue category became quantitatively important after 1977. At present, Form P does not require a separate reporting of MTS-like service revenues as distinct from private line services that is fully comparable to the separation in Monthly Report No. 4 for the Bell System.

TABLE 3  
 TOTAL SPECIALIZED COMMON CARRIER  
 REVENUES, 1975-1979  
 (\$000)

Specialized Communication Service	Year				
	1975	1976	1977	1978	1979
Dedicated Voice Grade	n.a.	n.a.	69,852	81,993	98,431
Shared/Switched Voice Grade	n.a.	n.a.	36,108	57,324	137,938
Dedicated Data			-	-	-
Shared/Switched Data	n.a.	n.a.	121	1,654	557
Other Operating Revenue	n.a.	n.a.	12,118	15,443	10,043
Total	29,978	80,769	118,199	156,414	246,968

SOURCE: FCC Form P (Annual Report of Miscellaneous Common Carriers).

n.a.: not available

TABLE 4  
TOTAL SPECIALIZED COMMON CARRIER  
REVENUES AS A PERCENTAGE OF TOTAL BELL SYSTEM  
INTERSTATE AND INTRASTATE PLS REVENUES,  
1975-1979

Year	Percentage of Bell System Interstate PLS Revenues Only	Percentage of Bell System Combined Interstate and Intrastate PLS Revenues
1975	3.13	2.38
1976	7.87	5.87
1977	10.95	7.99
1978	12.78	9.23
1979	17.69	12.75

SOURCE: Monthly Report No. 4 and FCC Form P (Annual Report of Miscellaneous Common Carriers).

vis a vis the Bell System's PLS market.<sup>53/</sup>

Tables 1 through 4 provide a quantitative overview of the MTS/WATS and PLS markets. Such data do not emphasize, however, certain underlying structural differences between the MTS/WATS and PLS markets. These structural differences, quite apart from the substantial differences in revenues for the two markets, establish the basis for differential regulatory treatment of the PLS market as compared to the market for MTS/WATS. On the supply side, the technology and cost functions for MTS/WATS and PLS differ, although some plant is jointly used. In general, MTS/WATS are switched analog services satisfying both residential and business customer needs for "anybody-to-anybody" service. In contrast, private line services consist of various switched and dedicated services, both analog and digital, satisfying business needs for point-to-point service.<sup>54/</sup>

On the demand side, the type of customer and the individual demand functions for MTS/WATS and PLS are substantially different. More specifically, the demand for interstate MTS represents a mixture of residence

---

<sup>53/</sup>Table 3 should not be interpreted as necessarily suggesting significant growth in the SCC's market share of the PLS market since Form P data also include revenues for MTS-like services.

<sup>54/</sup>To simplify the ensuing discussion, the various Bell System services listed in Table 2 and the competing services offered by the SCC's will be treated as a single, generic market. Whether each individual private line service should be viewed as a PLS sub-market with its own cost function and Lancasterian characteristics, is not entirely clear at this time. See Notice of Inquiry and Proposed Rulemaking in the Matter of AT&T Private Line Rate Structure and Volume Discount Practice, Docket 79-246, 74 FCC 2d 226 (1979). The argument of this paper is not affected, however, by treating all private line services as a generic whole.

and business traffic.<sup>55/</sup> By contrast, the demand for private line services consists entirely of business traffic. In other words, the market for PLS is, strictly speaking, a "wholesale" market where PLS is purchased not for final consumption but as an "intermediate good" used in the production of the business firm's output. On the other hand, MTS/WATS is a combined "retail" and "wholesale" market where residence customers consume long distance toll calls as final goods but business customers consume MTS/WATS as intermediate goods.<sup>56/</sup> Except for WATS, which is used by business firms with large interstate message traffic, MTS business traffic is likely consumed by small business firms that do not generate sufficient message volume to justify usage of WATS or PLS, i.e., cost-effective bulk telecommunications services are not as yet generally available for smaller business firms.

AT&T provides both MTS/WATS and PLS. Since AT&T is a multi-output firm, the extent of AT&T's market-specific dominance in the MTS/WATS and PLS markets is important in evaluating the performance of these markets. In some ways the MTS/WATS and PLS markets are similar. Both markets have experienced entry in recent years, especially following the Execunet II court decision.

---

<sup>55/</sup>In 1978, the percentage of business traffic of total interstate MTS messages was 45.4% while residence traffic consisted of 53.6%. (1% consisted of interstate pay station messages.) See American Telephone and Telegraph Co., Bell System Statistical Manual, 1950-1978 (New York: American Telephone and Telegraph Co., 1979), p. 805. There has been a slight tendency for the percentage of residence message traffic to increase in recent years. Separate revenue data for business and residence MTS are not conveniently available. WATS is, of course, a business service.

<sup>56/</sup>The "retail-wholesale" market distinction has been suggested by Lee L. Selwyn and William P. Montgomery, "Deregulation, Competition, and Regulatory Response in the Telecommunications Industry," Public Utilities Fortnightly (November 22, 1979):13-22. Selwyn and Montgomery, however, use the retail-wholesale distinction somewhat differently than suggested here.

Furthermore, both markets may, in Panzar's analysis, be contestable. Moreover, AT&T has not shown conclusively that it is a natural monopoly in the production of both MTS/WATS and PLS.<sup>57/</sup>

But the demand-side differences between the MTS/WATS and PLS markets that must be considered in an assessment of AT&T's market-specific dominance imply differing levels of performance as well as the need for differing regulatory policies for each market. Concerning demand-side differences, MTS, as a retail market, presently has few close substitute services, especially for customers with relatively small message volumes.<sup>58/</sup> At present, the typical household that makes less than \$25 worth of long distance calls per month has few alternatives to MTS provided by AT&T.<sup>59/</sup> Much the same is true for the small business user of MTS. Consequently, until further competition develops,

---

<sup>57/</sup>As discussed in Section II, the modern view of natural monopoly would require that AT&T demonstrate that its multiple-output cost function is "subadditive." The conceptual and empirical difficulties of testing for subadditivity are substantial however. The Second Report in Docket 20003 noted that the "market test" of open entry would provide a useful test of natural monopoly as an alternative to formulating entry policy in the telecommunications industry based on the untested hypothesis of potential cost function subadditivity. See Second Report in the Matter of Economic Implications and Interrelationships Arising From Policies and Practices Relating to Customer Interconnection, Jurisdictional Separations and Rate Structure, FCC Docket 20003, Released January 29, 1980, p. 54.

<sup>58/</sup>Recent econometric models of MTS demand developed by Alex Belinfante of the Common Carrier Bureau of the FCC suggest that the demand for short haul MTS tends to be somewhat price inelastic while long haul MTS appears somewhat price elastic. These results, however, are only preliminary and continuing research is in progress. For some discussion of current FCC econometric demand modeling of MTS, see Alexander Belinfante, "Modeling Point-to-Point Long Distance Telephone Demand," a paper presented at the annual meeting of the American Statistical Association, Houston, Texas, August 11, 1980.

<sup>59/</sup>MCI currently advertises that households making more than \$25 worth of long distance telephone calls per month in an MCI service area can save considerably by using MCI's off-peak, long distance telephone service.

the MTS price structure is unlikely to reflect opportunity cost.<sup>60/</sup>

The performance of the wholesale PLS market, however, differs from the retail MTS market. From a market structure viewpoint, private line service customers may consider the PLS offerings of AT&T's competitors. As a result of the FCC's specialized common carrier decision,<sup>61/</sup> private line customers may now choose from a variety of PLS offerings provided by the specialized

---

<sup>60/</sup>In recent years, economists have attempted to determine from a static welfare economics point of view the conditions where market price should not reflect marginal cost. More specifically, recent work on the theory of "Ramsey pricing" shows that welfare optimal pricing, i.e., prices derived by maximizing a welfare function subject to a total revenue constraint, implies that market prices should systematically deviate from marginal cost. Among various "Ramsey theorems" the relationship  $[p_i - mc_i]/p_i = [\lambda / (1 + \lambda)](1/E_i)$  where  $p$ ,  $mc$ , and  $E$ , represent market price, marginal cost, and price elasticity of demand for good or service  $i$ , respectively, and  $\lambda$  is an undetermined Lagrangian multiplier associated with the total revenue constraint, suggests that the welfare-maximizing divergence of price from marginal cost is, among other things, an inverse function of the elasticity of demand for the commodity. Ramsey pricing rules assume that the firm experiences increasing returns to scale or produces multiple outputs such that common and joint costs must be allocated and recovered in the pricing of each individual output. The classic modern reference to this growing literature is William J. Baumol and David F. Bradford, "Optimal Departures from Marginal Cost Pricing," American Economic Review 60 (June 1970):265-83.- A brief yet clear exposition of the elements of Ramsey pricing is provided by S. C. Littlechild, Elements of Telecommunications Economics (Stevenage, U.K.: Peter Peregrinus Ltd., 1979), pp. 128-131. From a regulatory perspective, applying Ramsey rules raises complex problems of equity and measurement. Thus, is it "fair" for consumers having few substitute alternatives (say, MTS users) to pay a larger markup over marginal cost than consumers having competitive alternatives (say, PLS users)? Moreover, can the marginal cost of individual services produced by a multi-output firm be estimated with sufficient precision to develop welfare-optimal tariffs? These difficulties among others have not been satisfactorily resolved, notwithstanding the existing pricing constraint imposed by the FCC in Docket 18128 that AT&T's tariffs for interstate telecommunications services should be based on "fully distributed costs." These difficulties are reviewed in Jerry B. Duvall, "Pricing and Cost Allocation Issues in Interstate Telecommunications Markets," OPP Working Paper, forthcoming.

<sup>61/</sup>See 29 FCC 2d 870 (1971).

common carriers as well as AT&T.<sup>62/</sup>

Furthermore, the conduct of buying and selling in the PLS market will differ from the MTS/WATS market. Since PLS is a business service market, purchasers of the service are frequently professional buyers who are well informed of competitive alternatives and their prices. As economists increasingly began to emphasize in the 1970's, the functioning of a market depends to a considerable extent on the quantity and quality of information available to buyers.<sup>63/</sup> But the production of information is costly. Therefore, consumers will "search" for price and product information so long as the potential benefits from continued search (e.g., lower prices) exceed the costs.<sup>64/</sup>

Various models of market behavior that include information cost have appeared in the recent literature.<sup>65/</sup> A recent model advanced by Schwartz and

---

<sup>62/</sup>A brief yet somewhat dated discussion of the variety of services provided by the SCC's and their similarities and differences compared to AT&T's private line services is provided by Robert F. Stone, Mark A. Schankerman, Chester G. Fenton, Selective Competition in the Telephone Industry (Cambridge, Mass., T+E, 1976), Chapter 6.

<sup>63/</sup>The classic reference is George Stigler, "The Economics of Information," Journal of Political Economy 69 (June 1961):213-35.

<sup>64/</sup>A major criticism of the textbook models of perfect competition is the implicit assumption of zero search costs. Thus, it is assumed that consumers know without searching the competitive price corresponding to minimum average cost of the firm. More realistically, of course, observed retail prices of homogeneous products tend to follow a frequency distribution with monopoly and competitive prices at each tail of the distribution. The persistence of such a distribution reflects at least in part the cost of information necessary to collapse the distribution at the competitive price.

<sup>65/</sup>For an overview of some of the recent issues in the economics of information, see Joseph E. Stiglitz, "Symposium on Economics of Information: Introduction," Review of Economic Studies 44 (October 1977):389-391.

Wilde emphasizes that equilibrium market price depends on both the number of "shoppers" in the market and the adoption of a "mixed search strategy."<sup>66/</sup> In terms of their model, Schwartz and Wilde observe that

. . . Because some consumers always comparison shop, firms that cut prices could be rewarded and firms that raise prices could be punished. The extent to which the prospect of reward or punishment influences firm behavior depends upon the ratio of comparison shoppers to the total number of shoppers in the market. If that ratio is sufficiently great, the market will generate a competitive equilibrium.<sup>67/</sup>

The existence of well-informed, professional buyers or "shoppers" for PLS should have a considerable impact on the performance of this market, forcing the real-world frequency distribution of market prices toward the competitive price. Thus, given both the number of competing PLS carriers and the resources allocated by business customers to product "search," prices for PLS

---

<sup>66/</sup>Alan Schwartz and Louis L. Wilde, "Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis," University of Pennsylvania Law Review 127 (January 1979):630-682. A more technical paper that develops the underlying mathematical analysis is provided by Louis L. Wilde and Alan Schwartz, "Equilibrium Comparison Shopping," Review of Economic Studies 46 (July 1979):543-553.

<sup>67/</sup>Schwartz and Wilde, "Intervening in Markets on the Basis of Imperfect Information: A Legal and Economic Analysis," p. 650.

would be expected to reflect cost more closely than MTS.<sup>68/</sup>

Concerning the extent of AT&T's market specific dominance in the MTS/WATS and PLS markets, AT&T is clearly dominant at present in the MTS market. Such recent entrants as MCI, Southern Pacific, or SBS in the market for long distance, switched message service are fringe competitors that have not to

---

<sup>68/</sup>Whether or not AT&T's private line tariffs reflect "cost" has been a long-standing issue before the FCC. The issue became critical when AT&T filed its first TELPAK tariff in 1961 as a competitive response to the FCC's Above 890 decision in Docket 11866. This landmark decision allocated a portion of the radio spectrum for private microwave systems that allowed users to provide their own long distance telecommunication facilities, rather than relying exclusively on AT&T's common carrier private line facilities. To determine the lawfulness of the TELPAK tariff, the FCC conducted a number of extensive, protracted proceedings culminating in the Docket 18128 decision in 1976 that determined that fully distributed costs using "Method 7" would be the FCC's standard for "legal costs." The specialized common carrier decision in 1971 led to further competitive PLS pricing responses by AT&T. In particular, AT&T in 1973 filed proposed revisions to its PLS tariffs that departed from its traditional policy of uniform nationwide rate averaging (the so called "Hi-Lo" tariff). On October 4, 1979, the FCC terminated its most recent investigation of AT&T's private line tariffs in Docket 20814. In its Docket 20814 Final Decision and Order, the FCC terminated further investigation of AT&T's Multi-Schedule Private Line (MPL) tariff; prescribed an interim MPL costing methodology pending the outcome of Docket 79-245 that will prescribe a cost allocation manual for implementing the Docket 18128 decision; but did not address PLS rate structure issues. From the "Seven Way Cost Study" ordered by the FCC in 1964 in Docket 14650 through AT&T's most recent Central Submission filed on June 30, 1980, private line services have earned rates of return generally below the allowed rate of return and often substantially below the rate of return for MTS. In terms of a fully distributed cost standard, such low--sometimes actually negative--rates of return for certain private line services imply tariffs that are actually "below cost". Of course, fully distributed costs based on historical accounting data need not necessarily reflect economic opportunity costs that govern optimal decision making in unregulated, competitive markets. Moreover, such "legal cost" notions are not necessarily appropriate for formulating forward-looking deregulatory policies for workably competitive markets.

date had a major impact on the performance of the MTS/WATS market.<sup>69/</sup> Moreover, the market demand for MTS is probably less elastic in general than for PLS, given the present lack of alternatives to MTS for long distance telecommunications for many users. This situation will probably change, however, as competition develops in the MTS/WATS market. But, for the present, AT&T remains dominant in the MTS/WATS market viewed from either the demand or the supply side of the market.

In terms of the PLS market, AT&T's market-specific dominance is less pronounced. First, AT&T faces substantial competition on the supply side of the PLS market. While existing fringe competitors such as MCI and Southern Pacific may influence AT&T's pricing conduct to some extent, the major near-term competitive threat to important segments of AT&T's PLS market is the beginning of entry by new communication firms such as SBS and the potential entry by others such as the Xerox Corporation's XTEN "digital termination service."<sup>70/</sup> So long as the threat of entry of such large corporate entities is credible, such potential competitors to AT&T provide an important constraint on the potential abuse of dominant-firm market power by AT&T. The possibility of these "build around" communications entities competing with AT&T in the PLS market provides a strong incentive for competitive-like conduct by AT&T.

---

<sup>69/</sup>See "Business Consumers Step Up Use of Phone Service From Bell Rivals," Wall Street Journal, 9 July 1980, p. 26.

<sup>70/</sup>See Notice of Proposed Rulemaking and Inquiry in Docket 79-188, released August 29, 1979.

Second, the market demand for PLS is probably reasonably elastic, given the availability of competitive alternatives to AT&T's offerings. As the choice of substitute private line services broadens in the near-term future, market demand may become increasingly elastic. Consequently, AT&T's market-specific dominance viewed from the demand side of the PLS market is not quite as overwhelming as its presence in the current MTS market. Given these structural differences, performance in the PLS market should more closely approximate a workably competitive market.

#### V. THE PROBLEM OF INTER-SERVICE CROSS-SUBSIDIZATION

The previous discussion suggests that the existing and near term structure of PLS and MTS/WATS markets are quite different. As long as rate base regulation of the MTS/WATS market is maintained, the problem of inter-service cross-subsidization between MTS/WATS and PLS must be considered. Over the past decade the FCC has been concerned with the incentives that rate base regulation establishes for shifting costs from competitive-like services to a

monopoly service by a multi-output, regulated firm such as AT&T.<sup>71/</sup> In Docket 18128, the FCC prescribed a fully-distributed costing methodology (FDC) for detecting inter-service cross-subsidization.<sup>72/</sup> The allocation of cost into 17 service categories was mandated to protect the rate payer from unlawful service cross-subsidization. Implementing this decision as originally

---

<sup>71/</sup>More specifically, the notion of cost shifting has focused on the incentives for a rate base regulated firm to classify costs as "unattributable" rather than "directly attributable." Unattributable costs cannot be directly linked on a "cost causational" basis to specific services and correspond loosely to the economist's concepts of joint and common costs. A rate base regulated firm facing competitive entry in selected markets may have an incentive to classify costs as unattributable (and possibly engineer plant to be joint cost in nature) so that the incremental, attributable costs of producing the competitive services appear low. Consequently, using an incremental cost standard, the rate base regulated firm can justify "low" tariffs for services facing competitive entry. This possible manipulation of the regulatory cost standard among other difficulties led the FCC to reject AT&T's notion of "long run incremental cost" (LRIC) as the basis for legal costs in Docket 18128. See 61 FCC 2d 615 (1976). For further discussion, see Roger G. Noll and Lewis A. Rivlin, "Regulating Prices in Competitive Markets," Yale Law Journal 82 (June 1973): 1426-1434. Of course, other regulatory cost standards, including fully distributed cost (FDC) methodologies considered in Docket 18128, are also subject to manipulation and may provide incentives for the regulated firm to classify costs as unattributable.

<sup>72/</sup>During the deliberations in the Docket 18128 proceeding, AT&T opposed the usage of FDC as a test for inter-service cross-subsidization. AT&T proposed instead the "burden test" that estimates the net revenue and cost reductions occasioned by eliminating a particular service offered by a multi-output firm. The FCC, however, adopted FDC as its cost standard for AT&T and therefore defined inter-service cross-subsidy in terms of this methodology. See 61 FCC 2d 615 (1976). For a brief discussion of various concepts of cross-subsidization, see Edward E. Zajac, Fairness or Efficiency (Cambridge, Mass.: Ballinger Publishing Co., 1978), Chapter 8. A lucid discussion of the Docket 18128 proceeding and its historical context is provided by Walter G. Bolter, "The FCC's Selection of a 'Proper' Costing Standard after Fifteen Years--What Can We Learn From Docket 18128?" in Assessing New Concepts in Public Utilities, ed. Harry M. Trebing (East Lansing, Mich.: Michigan State University, 1978), pp. 333-372.

planned, however, has proved to be a formidable task.<sup>73/</sup>

Major simplifications in the costing methodology prescribed in Docket 18128 including the use of telephone industry "separations" data are currently proposed by the FCC's Common Carrier Bureau in Docket 79-245. These simplified guidelines should enable the FCC to monitor AT&T's cost allocation in broad terms and across only three service categories, viz., MTS, WATS, and PLS, rather than in fine detail as originally contemplated in the Docket 18128

---

<sup>73/</sup>At present, ongoing Docket 79-245 is considering the prescription of a cost allocation manual that will finally officially establish the procedures for the application of the cost allocation guidelines established in Docket 18128 in 1976.

decision.<sup>74/</sup> Although AT&T may still attempt to shift costs in order to increase total profits, this aggregated FDC methodology will provide a

---

<sup>74/</sup>From a legal and accounting perspective, the allocation of jointly-used plant investment is inherently arbitrary. Thus, the selection of an appropriate allocation rule or formula should be determined with care. For example, a "relative use" rule will be to some extent a function of the prices of the services using the jointly-used plant. Thus, consideration of such interdependencies is required when choosing a particular allocation rule. As discussed in footnote 60, economists have derived pricing rules that allocate joint and common costs such that the recovery of such costs minimizes the loss in welfare. The FCC, however, in its Docket 18128 decision did not officially recognize such static welfare-maximizing allocation principles. Instead, the quasi-economic and accounting principle of "historical cost causation" was selected by the FCC as the method for allocating joint and common costs in the Bell System.

While accounting-type allocation rules for joint and common costs are inherently arbitrary and without rigorous economic justification, such rules may have significant economic implications. (For a recent theoretical discussion of this point, see Ronald R. Braeutigam, "An Analysis of Fully Distributed Cost Pricing in Regulated Industries," Bell Journal of Economics (Spring 1980):182-196.) Such allocation rules have played a prominent role in the "separation principles" used by the telephone industry for toll settlement purposes between independent and Bell System operating companies. Traditional separations "allocators" such as Subscriber Line Use (SLU) and Subscriber Plant Factor (SPF) have been "revised" over time to reflect evolving changes in the local and long distance telephone markets, political compromises between federal and state regulatory authorities, and the Bell System's corporate objectives. The important point is that such arbitrary cost allocation rules either between political jurisdictions (separations) or among interstate services (FCC fully distributed cost methodology) affect the market conduct of telecommunications carriers. While imperfect, such cost allocation procedures, if subject to public inspection, unambiguous in concept and application, and reasonably auditable, can be used as regulatory tools to constrain some aspects of dominant carrier conduct. Thus, a simplified, fully distributed cost (FDC) methodology based on existing separations data is a useful regulatory tool for preventing arbitrary reallocations of cost by AT&T for purposes of inter-service cross-subsidization. The application of such a simplified FDC methodology is presently proposed by the FCC's Common Carrier Bureau in Docket 79-245 and, if adopted by the Commission, will provide an effective regulatory tool for controlling inter-service cross-subsidization during the transition phase toward a more competitive telecommunications industry. With sufficient entry in the MTS market, the need for regulatory intervention in general and arbitrary cost allocation rules in particular will diminish.

regulatory tool that can detect and thereby constrain gross, unjustified cost allocations by AT&T.<sup>75/</sup> Under the proposal of this paper, the allocation of jointly-used plant and equipment between MTS/WATS and PLS would still be required in accordance with Docket 79-245. The portion of plant and equipment jointly-used with MTS/WATS as well as the directly assignable investment in PLS plant and equipment would be removed, however, from AT&T's interstate rate base. PLS tariffs would no longer require "cost justification" in terms of reported accounting costs.

While AT&T still retains the incentive to shift of PLS costs onto the MTS/WATS ratepayer under this regulatory treatment, the only constraint that can be effective against this practice is the cost allocation procedure. Once this "cost-cut" is made in terms of the procedures prescribed in the Docket 79-245 cost allocation manual, MTS/WATS tariffs will not be allowed to recover PLS reported costs, regardless of the regulatory policy toward PLS markets. Further, to the extent shortcomings in or an evasion of the cost manual allow AT&T to cross-subsidize private line services, reported costs on PLS will fall short of actual costs. But it is the reported costs upon which tariffs must be based, and in this circumstance AT&T's competitors would not be protected by rate base regulation. In fact, binding rate of return regulation would

---

<sup>75/</sup>In the unlikely event that the FCC's cost allocation procedure imposes too few costs on the MTS ratepayer, removal of RBR including "cost-based" tariff justification from PLS markets would allow AT&T to price private line services below their reported cost and closer to short run marginal costs. In the long run, however, the distortion will lead to the inefficient provision of this service if planning and investment decisions continue to be based on the distorted cost allocation.

force AT&T to maintain low prices and forestall entry for a longer period of time than may be dictated by their own optimal pricing strategy.

The cross-subsidy issue is therefore of limited importance to the design of regulatory policy for PLS markets in a post-Cost Manual world.<sup>76/</sup> Certainly AT&T as a profit-maximizing firm will attempt to evade the restraints of the Manual, but the official adoption and implementation of the Manual would in fact prevent ad hoc regulatory attempts to protect its competitors.

---

<sup>76/</sup>Further questions arise if we consider the long-run impact of PLS regulation on cross-subsidization. One approach to the problem would be to extend the Averch-Johnson model to a firm constrained by a cost allocation procedure. The production technique and the output level of the regulated firm would depend on the nature of the cost allocation and whether or not a rate of return constraint was applied to the competitive-like service. A first step in this direction is provided by Ronald Braeutigam, "The Regulation of Multiproduct Firms: Decisions on Entry and Rate Structures". Braeutigam applies an Averch-Johnson model to a multiproduct firm subject to overall rate base regulation. Not surprisingly, he finds that the entry of new firms producing near-substitutes to one of the firm's two regulated products may or may not improve economic efficiency, depending on features of the demand and cost functions. In light of these results, it is most likely that an extension of this model to include the effect of PLS regulation would similarly yield indeterminate results. More importantly, the validity of an extended Averch-Johnson model to the cross-subsidy issue is highly dubious, since AT&T will face increased competition for MTS services thereby undermining its ability or incentive to cross-subsidize private line services.

## VI. REGULATORY POLICY FOR A DEREGULATED PRIVATE LINE MARKET

Once the rate of return constraint on the PLS market is removed, AT&T as a dominant firm can be expected to pursue a pricing strategy that maximizes expected profits over time. In general, a dominant firm, given its market power, can restrict output and thereby influence market price in the short run. But if the market price exceeds the long run costs of production, the competitive fringe will expand and erode the market power of the dominant firm.<sup>77/</sup> The dominant firm is then faced with the trade-off of immediate for long run profits. In designing an optimal pricing strategy the dominant firm must consider several factors including the extent of its cost advantage over its rivals; the speed at which entry occurs in response to the gap between price and long-run cost; and the dominant firm's preference for present over

---

<sup>77/</sup>Alternatively, the analysis of the dominant firm can focus on "large-scale entry" where the potential entrant must consider the effect of its contribution to output on the market price of the good. In response, the dominant firm can either maintain its level of output and allow both firms' profits to drain away as the price falls or reduce its output to keep prices up and allow both firms to share the monopoly profits. The analysis of "large-scale entry" is not determinative but simply depicts alternative scenarios based on the assumption of the dominant firm's strategic behavior. A crucial variable in these models is whether the degree of scale economies relative to market demand can serve as an effective entry barrier. These models are not considered here since in most PLS markets entry can occur on an efficient scale without causing a significant drop in the market price. For further discussion of these models, see Scherer, Industrial Market Structure and Economic Performance, pp. 243-252.

future profits.<sup>78/</sup> In the PLS market, due to the absence of significant cost advantages and the rapid pace of entry, even the best designed pricing strategy will not yield AT&T excess profit for very long, and rules restricting its pricing freedom may have little value.

The potential welfare gains from deregulation, moreover, appear to outweigh the efficacy of rate base regulation for attenuating a limit pricing strategy for PLS by AT&T. A major advantage of deregulating the PLS market is that prices could adjust quickly to reflect present and near-term opportunity costs rather than the embedded or historical accounting costs, although prices would still be distorted to some extent by the application of the Docket 79-245 cost allocation process. This pricing flexibility would promote economic efficiency by 1) allowing PLS prices to reflect quickly the benefits of new, low-cost technologies; 2) permitting excess demand to be rationed through price changes that may also signal the need for new capacity; and 3) accommodating any PLS peak-load or time-of-day usage patterns. Such pricing flexibility provides a major stimulus to improved market performance by sharply reducing the incentives for distorted resource allocation that rate of return regulation implies.

Given the market power of AT&T in a deregulated PLS market, would not AT&T use its new pricing flexibility to price its private line services anti-competitively? In particular, would not AT&T attempt to force its PLS fringe competitors out of business by predatory pricing practices? While such fears

---

<sup>78/</sup>The classic exposition of the economic theory describing the dominant firm's optimal pricing strategy is by Darius W. Gaskins, Jr., "Dynamic Limit Pricing: Optimal Pricing Under Threat of Entry," Journal of Economic Theory 3 (September 1971):306-22.

of anti-competitive conduct may not be irrational, the potential for such predatory behavior may be more apparent than real. Unless the dominant firm holds a significant cost advantage over its rivals (which may simply reflect economies of large-scale operations), the effectiveness of predatory pricing is limited. It will be successful only if the dominant firm can withstand losses for a longer period of time than its competitors and then recoup its losses by raising price once its rivals have abandoned the market. Since the higher price will stimulate new entry in turn, the practice of predatory pricing ultimately depends on an irrational response by competitive firms.<sup>79/</sup> If the dominant firm holds no cost advantage over its rivals, the only promising predatory strategy is to limit its own losses by restricting price cuts to selective geographic markets or across a small number of products or services where it faces new competition. This strategy may enable the firm to exclude potential competitors in other markets without any additional below-cost pricing. As stated by Richard Posner, "the costs

---

<sup>79/</sup>The pathbreaking article by John McGee, "Predatory Price Cutting: The Standard Oil (N.J.) Case," Journal of Law and Economics 1 (October 1958):137-169, has influenced an extensive literature which now forms the "classic case" against predatory pricing. More recently, economists and other antitrust scholars have reopened the debate by demonstrating its rationality under selected circumstances. These include situations where the predator serves many geographic markets, where efficient entry must take place on a large scale relative to the size of the dominant firm, or where the dominant firm operates more efficiently than its competitors or potential competitors. For a good summary of this literature, see George Hay, "A Confused Lawyer's Guide to the Predatory Pricing Literature," unpublished paper. Predatory pricing in selected geographic markets is of most concern in PLS markets as none of the other conditions appear to exist. Competitive carriers have erected and maintained networks a fraction of AT&T's size, which have become self-sustaining once regulatory barriers that protected AT&T's monopoly services were removed. Moreover, to the extent economies of scale exist, applying a cost standard to AT&T's PLS tariffs will not yield a satisfactory result for the reasons discussed in the text below.

incurred by the firm in using predatory pricing in one market may generate greater deterrence benefits in other markets" and cause competitors to be reluctant to enter any of the firm's markets.<sup>80/</sup>

Attempting to identify and forestall this pricing strategy by using cost data to establish a price floor is a difficult regulatory task. The cost data must be obtained for the specific market thought to be under attack by a predator. Clearly, accurate data are necessary for such review purposes. But a major difficulty with obtaining relevant cost data is choosing an appropriate cost standard.<sup>81/</sup> Any cost standard is subject to dispute. For example, there are drawbacks in using either average or marginal cost as the

---

<sup>80/</sup>Richard A. Posner, Antitrust Law: An Economic Perspective, (Chicago: University of Chicago Press, 1976), p. 186.

<sup>81/</sup>The FCC in its Docket 18128 decision selected fully distributed cost Method 7 as its "legal cost" standard for promoting the regulatory goal of carrier "accountability." As Braeutigam shows in the article cited in footnote 74, a fully distributed cost standard may not promote economic efficiency. Consequently, to the extent that an efficient allocation of resources is a desirable regulatory and social goal, then some cost concept other than FDC may be preferable for developing a cost test for predatory pricing.

price floor.<sup>82/</sup> The dominant firm may under certain circumstances price below average cost (but above marginal cost) as a justifiable reaction to excess capacity in the industry. On the other hand, a marginal cost standard is unlikely to place a serious constraint on predatory behavior because fixed costs are such a large share of total costs. In brief, utilizing cost data to set a floor below which prices would be considered predatory requires the FCC to apply a detailed cost standard as a regulatory tool, an approach that the FCC has found extremely difficult to develop, and apply to date.

Relying on cost data to prevent predatory pricing may also have detrimental effects. Inefficient competitive firms could seek protection under a price umbrella set by the dominant firm above its cost of production. The dominant firm may readily adopt and maintain a high price and

---

<sup>82/</sup>The establishment of a test for predatory pricing has been the focus of several recent articles. Areeda and Turner opened the controversy by advocating a marginal cost standard which would be applied using average variable cost as a suitable measurable proxy. See Phillip Areeda and Donald F. Turner, "Predatory Pricing and Related Practices Under Section 2 of the Sherman Act", Harvard Law Review 88 (February 1975):697-733. Scherer, Williamson, and Joskow and Klevorick are all unwilling to rule out pricing below average cost (but above marginal cost) as predatory. In order to apply an average cost standard, however, they have had to develop a further screening to distinguish competitive from predatory behavior. Williamson would focus on the output response of the firm to competitive entry. See Oliver E. Williamson, "Predatory Pricing: A Strategic and Welfare Analysis", Yale Law Journal 87 (December 1977):284-340. Joskow and Klevorick would only apply a cost standard to an industry that is structurally susceptible to predatory behavior, and even then they would allow the firm to present a defense that excess capacity in the industry justified pricing below average cost. See Paul L. Joskow and Alvin K. Klevorick, "A Framework for Analyzing Predatory Pricing Policy," Yale Law Journal 89 (December 1979):213-270. It would appear that the FCC would have a hard time implementing any complex standard without utilizing the same market and cost data that the FCC has attempted to use for ratemaking purposes but with little apparent success to date. See also F. M. Scherer, "Predatory Pricing and the Sherman Act: A Comment", Harvard Law Review 89 (March 1976):868-903.

accept a reduced market share, rather than face a regulatory proceeding instituted by its competitors. Considering the ambiguous nature of cost data, too high a cost floor could easily be supported by an improper interpretation of that data.

Regulation of the terms on which PLS is offered, however, should be retained to discourage predatory pricing in selected markets by AT&T. The FCC's regulatory powers can be directed in two ways at altering the potential payoff to this predatory strategy. First, AT&T's freedom to control its own losses from price cutting can be eliminated. The major tools essential for such a policy, viz., tariff filing and simplification, resale, and non-discriminatory access, are already at hand. Moreover, they can be extended as necessary to prevent AT&T from controlling its own losses from predatory pricing or containing the spillover of predation to other markets. Secondly, these same regulatory policies will help AT&T's competitors minimize their losses from a predatory foray by reselling AT&T's services.

More specifically, any private line offering under current regulations must be public and available to all customers on a nondiscriminatory basis. The FCC is also considering a restructuring of AT&T's PLS tariffs from their existing 26 interstate categories to a few basic services. 83/ Tariffs for PLS should then be unbundled with a price for each service clearly established. This simplification will allow customers to assemble optimal

---

83/See Notice of Inquiry and Proposed Rulemaking in the Matter of AT&T Private Line Rate Structure and Volume Discount Practices, Docket 79-246.

bundles of communications services from different vendors.<sup>84/</sup> AT&T would then be unable to fragment markets or restrict price cuts to the markets served by its competitors. AT&T's losses could then far exceed its competitors' losses from predatory pricing.

AT&T's PLS offerings will also be available to resellers. "Resale is the subscription to communications services and facilities by one entity and the reoffering of communications services and facilities to the public (with or without adding "value") for profit."<sup>85/</sup> Tariff restrictions on the resale of some private line services are currently prohibited, and the FCC should extend this prohibition to all private line services. Allowing carriers to broker or arbitrage these services will further prevent AT&T from limiting its costs from predatory pricing.<sup>86/</sup> PLS offerings could then be broken down in many ways and resold to a variety of customers who otherwise would not shop in PLS markets. For example, a private line of sufficient bandwidth could be broken down by multiplexing, or any private line could be resold for different time periods. AT&T's private line facilities could also be resold to MTS customers thereby challenging AT&T's dominance of this market. Should AT&T attempt to pursue a predatory pricing strategy, these forms of resale will impose costs on AT&T that its PLS competitors will not have to bear.

---

<sup>84/</sup>The FCC in its recent "Computer II" decision has ordered AT&T to "unbundle" its tariffs for transmission services and customer premises equipment (CPE). A discussion of how unbundling improves economic efficiency in consumption is provided in the Docket 20828 (Second Computer Inquiry) Final Decision adopted April 7, 1980, pp. 63-70.

<sup>85/</sup>Resale and Shared Use of Common Carrier Services, 60 FCC 2d 261 (1976).

<sup>86/</sup>Enhanced service carriers that add valuable information handling to basic communications services also depend on resale to serve the public effectively.

Most importantly, the private line carriers that AT&T might attack by predatory pricing could resell AT&T's services in order to minimize their own losses. Thus, a competitor could expand its customer base and penetrate other markets including MTS, while under predatory attack without incurring any additional cost of facilities. In the event that AT&T raised prices, its competitors could lower their output by reselling less than before. AT&T would then absorb the entire loss due to its inability to lease the excess facilities that were expanded to meet demand stimulated by the initial price cut. A resale policy, therefore, shifts almost the entire cost of predatory pricing onto the dominant firm and destroys its effectiveness as an entry forestalling strategy.

In the event the regulation of the terms of sale in the PLS market are not effective at restraining predatory conduct, more stringent controls could be applied short of reimposing rate base regulation. Most of the problems inherent in relying on cost data to restrict dominant firm behavior can be avoided by focusing directly on its pricing strategy.<sup>87/</sup> The setting of price

---

<sup>87/</sup>An alternative rule discussed by Williamson could prohibit the firm from responding to a rival's entry by increasing output faster than market demand. Therefore, even if it cuts prices, AT&T would be unable to satisfy demand by itself and would leave shortages to be filled by competitors at a higher price. Although this approach could easily be implemented through the Section 214 process, it has several drawbacks as identified by Baumol. First, it requires a projection of future demand which is particularly difficult in a rapidly expanding industry subject to technical innovations. Secondly, it prevents competitive price reductions by the dominant firm in response to entry. Nevertheless, the Williamson Rule demonstrates a creative and perhaps informal use of Section 214 authority to oversee AT&T's expansion plans in markets where it faces competitive entry. Williamson argues that if large economies exist, a rule of this nature would be superior to a cost test, since a dominant firm would evade a cost test by building the excess capacity that would allow it to respond to entry by increasing output, while still maintaining price above cost.

below cost is only the first stage of predatory behavior (and not in itself harmful to consumers); the second stage occurs only if competitors are forced out, and the predator is free to set price above cost and reap excess profits. The "Baumol Rule" is designed to prohibit the second stage and thereby undermine the entire practice of predatory pricing.<sup>88/</sup> The Baumol Rule would prohibit the dominant firm's withdrawal of recently lowered prices upon the cessation of its competitors' operations. While the firm would be allowed to raise prices to cover increased costs (not under its control), it would not be free to change price in response to changes "in the state of competition in the market."<sup>89/</sup> While application of this rule depends, unfortunately, on cost data (to support a later price increase), the threat of its application by a regulatory agency may be sufficient to deter predatory conduct. The drawback of relying on a rule that restricts a firm's pricing freedom must be considered and weighed against the need for a pricing rule in light of the power of regulatory tools previously discussed.<sup>90/</sup>

---

<sup>88/</sup>William J. Baumol, "Quasi-Permanence of Price Reduction: A Policy for Prevention of Predatory Pricing," Yale Law Journal 89 (November 1979):1-26.

<sup>89/</sup>Ibid., p. 1.

<sup>90/</sup>Joskow and Klevorick, op. cit., also point out that the Baumol rule may not deter a dominant firm from retaining a price below cost in a selected market as a deterrent to entry in other markets.

## VII. CONCLUDING OBSERVATIONS

The deregulatory proposal of this paper is a modest step toward improved market performance in the private line market. Without a rate-of-return constraint on its PLS earnings, AT&T is provided an important incentive for greater innovation and improved customer service. If it is successful in its efforts, AT&T will realize earnings unconstrained by rate of return regulation. Both AT&T's customers as well as shareholders should benefit from this regulatory reform. Moreover, an analysis of AT&T's market-specific dominance shows that both the present availability of competing private line services and the near term entry of new communications entities provide constraints on potential anti-competitive conduct by AT&T.

The FCC already has in place most of the necessary policies for encouraging workable competition in the PLS market. Expanded resale policies and the assurance of nondiscriminatory access to dominant carrier facilities will provide the essential regulatory input for achieving better performance in the PLS market. The danger of predatory conduct by AT&T toward its fringe competitors is, perhaps, real, although the long term threat to such competitors can be exaggerated. The adoption of a simplified cost allocation manual would provide a workable regulatory tool that could detect gross abuse of market power by AT&T. By specifying unambiguous, auditable, although arbitrary procedures for separating both the directly assignable expenses and plant investment as well as the jointly-used facility costs of PLS from MTS/WATS, the FCC can restrict AT&T's ability to shift costs between PLS and MTS/WATS for purposes of inter-service cross-subsidization. Nothing further is gained while economic efficiency is lost by also imposing a rate-of-return

constraint on PLS. Should AT&T pursue a predatory pricing strategy despite the financial losses that unrestricted resale will generate, the FCC can impose an price rule that would penalize the predator while not simultaneously encouraging the inefficient allocation of resources that rate base regulation implies.