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11 Divestiture and the Separate Subsidiary Requirement

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DIVESTITURE OF AT&T
AND THE SEPARATE SUBSIDIARY REQUIREMENT*

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I. INTRODUCTION

Massive changes in telecommunications regulation in the United States in recent years have attempted to reform and rationalize a structure which over the past two decades had become increasingly obsolete and inappropriate. Under that structure, based largely on the 1956 Consent Decree, the American Telephone and Telegraph Company (AT&T) enjoyed a de facto monopoly on telephone service in the areas it served but was prohibited from entering competitive industries.^{1/} In the period following the Consent Decree technological advances and regulatory change permitted entry by new firms into AT&T's traditional monopoly markets. Technological change also blurred the boundaries between telecommunications and data processing. As a consequence the prohibition against AT&T's expansion into industries it was technically well suited to enter appeared to cause increasing inefficiencies. At the same time, AT&T appeared able to use its monopoly power, and its regulated status, to compete unfairly in unregulated markets at the expense of both competitors and ratepayers.

In response to these changes in telecommunications markets two major legal and regulatory changes have been imposed, the first by the Federal Communications Commission (FCC) and the second in settlement of an antitrust suit against AT&T. In 1980 the FCC, in its Second Computer Inquiry (Computer II), allowed AT&T to enter competitive industries on an unregulated basis but

^{1/} U.S., Congress, House, Committee on the Judiciary, Hearings Before the Antitrust Subcommittee, 85th Cong., 2nd sess., pt. 2, vol. I (March 25-May 22, 1958), Consent Decree reprinted, 1845-1861.

required it to do so through completely separate subsidiaries.^{2/} Then, in 1982, the Department of Justice and AT&T entered into a new consent decree, incorporated in the Modified Final Judgment (MFJ), which required divestiture of the local Bell operating companies (BOC's) from AT&T.^{3/} This decision separated AT&T's interexchange telephone service and equipment-manufacturing functions, both at least potentially competitive, from monopoly local telephone service, and in effect replaced the earlier decree.

Divestiture of the BOC's under the MFJ occurred on January 1, 1984; the Computer II separate subsidiary requirements remain in place for AT&T. These two approaches to rationalizing telecommunications regulation, arrived at independently, may in combination prove excessive or inconsistent. If divestiture of the BOC's is sufficient to prevent competitive abuses of monopoly power, particularly in the provision of equipment and interexchange telephone service, then the Computer II separate subsidiary requirement may be unnecessary and may impose costs in the provision of telephone service not balanced by any benefit. On the other hand, if AT&T retains the ability and incentive to exploit monopoly power, or the regulatory process, then the separate subsidiary requirement, or some similar provision, may be necessary to prevent the distortions and inefficiencies such abuses might cause. This paper examines the rationale for the separate subsidiary requirement in the light of the far-reaching structural changes in the telephone system mandated by the MFJ, and discusses the implications for Commission policy in regulating AT&T.

^{2/} Second Computer Inquiry, 77 F.C.C. 2d 384 (1980).

^{3/} United States v. Western Elec. Co. (American Tel. & Tel. Co.), 552 F. Supp. 131, 226-34 (D.D.C. 1982).

II. BACKGROUND

A. The Telephone Industry in 1956

In 1956 AT&T was the sole provider of interexchange telephone service in the United States. It also provided the only local service to about 85 percent of the market. AT&T supplied all customer premises equipment in areas it served, and manufactured all that equipment. Barriers to entry into AT&T's markets appeared high. In local service most states prohibited entry by competing telephone companies, and in any case economic barriers to entry appeared great enough to deter entry by potential competitors. In long distance service, AT&T could use the regulatory process to prevent entry entirely or at the least to impose protracted delays and great expense and uncertainty on potential entrants. Refusal to interconnect other long-distance services with the BOC's, making it impossible for them to complete calls, also appeared to be an effective competitive weapon. Technical barriers to entry also existed. While microwave technology provided an alternative means of delivering messages over long distances, economies of scale in microwave transmission made it competitive with wireline service only over relatively dense routes.^{4/}

In the provision of customer premises equipment (CPE), all telephone companies provided equipment to customers and, with regulatory consent, prohibited attachment of terminal equipment from other sources.^{5/} AT&T and most of the larger telephone companies manufactured most or all of their own equipment. The remaining equipment market was sufficiently small that in most

^{4/} Gerald W. Brock, The Telecommunications Industry: The Dynamics of Market Structure (Cambridge, Mass.: Harvard University Press, 1981), pp. 235, 198-200.

^{5/} This paper uses the terms customer premises equipment and terminal equipment synonymously.

cases economies of scale deterred entry into manufacturing. Thus while entry into manufacture of terminal equipment was technically feasible, regulatory barriers effectively prevented it. Thus AT&T was protected by high barriers to entry, either regulatory or technological, in all of its lines of business.^{6/}

The 1956 Consent Decree between AT&T and the Department of Justice limited AT&T to the provision of common carrier communications services but in return gave it a de facto monopoly over long distance service. AT&T's Western Electric manufacturing operations were restricted in practice, with minor exceptions, to production of telephone equipment for the Bell System. To a large extent the Consent Decree ratified the status quo, sanctioning AT&T's monopoly but preventing its expansion into other industries.

B. Changes in Market Boundaries

The telecommunications industry underwent major technological and regulatory changes in the two decades following the Consent Decree. In long distance service, first microwave and then satellite technology provided alternative technologies for delivering long-distance messages. The FCC or the courts, after long delay and over the strenuous opposition of AT&T, permitted the offering of microwave interexchange service in competition with AT&T, and required AT&T to allow other carriers to interconnect with the local exchanges.^{7/} MCI began to provide private line service in 1972 and switched

^{6/} Brock, pp. 235-36.

^{7/} 29 F.C.C. 2d 870 (1971); 60 F.C.C. 2d 393 (1976); Telecommunications Reports, August 1, 1977, May 15, 1978, and December 4, 1978.

service in 1975.^{8/} The Commission's "open skies" policy permitted entry into satellite communications by AT&T and other firms, beginning in 1972.^{9/} Satellite technology was used primarily for transmission of television signals, though it had voice and data applications as well. At the end of the 1970's the share of the other common carriers (OCC's) in the interexchange market remained small but was growing rapidly.^{10/}

The same years saw rapid development of computer technology. Computers perform many of the same functions as a telecommunications system, including moving, switching, and in various ways transforming information; a telephone network is, in effect, a large computer. As costs of electronic technology fell, it came increasingly to be used within telephone systems. Electronic switches, for instance, replaced electromechanical switches; digital equipment, well suited for either voice or data transmission, began to replace analog equipment. At the same time, telephone lines were used to interconnect computers and became an integral part of computer networks. An increasing number of services utilizing both data processing and transmission technologies, such as airline reservation systems, electronic fund transfer systems, and industrial production control systems, became possible and economically feasible.^{11/} Computers easily performed electronic mailbox functions that overlapped with the message switching function of the communications

^{8/} Brock, pp. 210-230.

^{9/} 35 F.C.C. 2d 844 (1972).

^{10/} The number of local lines used for accessing competitive long-distance switched services rose from 15,000 to 20,000 between April and August 1979. The specialized carriers had revenues of approximately \$50 million in that year. Brock, p. 229.

^{11/} See James Martin, Telecommunications and the Computer (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1976), pp. 78-93.

common carriers. With the advent of small computers and distributed processing, various switching and data transformation functions could be performed either in data processing equipment or in the communications network. Transmission and processing of information were increasingly integrated in the same equipment.

As the technical boundaries between communications and data processing began to disappear, the regulatory boundaries of the telephone market also became blurred. In some cases AT&T offered equipment with data processing capabilities under tariff, while other firms offered similar equipment on an unregulated basis.^{12/}

Over the same period a series of court and Commission decisions broke the tie between telephone service and provision of terminal equipment. AT&T opposition, however, greatly delayed the advent of free interconnection. While the Hush-a-Phone decision in 1956 established that public harm must be shown to justify restrictions on customer uses of the telephone system, not until 1977 could non-Bell equipment be connected legally and without charge to the telephone network.^{13/} Subsequently, however, AT&T's share of the terminal equipment market dropped precipitously.^{14/}

C. Regulatory Implications of Changing Market Boundaries

As a result of these changes, the threat of competition appeared in the long-distance market, and the terminal equipment market appeared likely to

^{12/} For instance, AT&T's Dataspeed 40/4 terminal, offered under tariff, was functionally equivalent to IBM's 3270. 62 F.C.C. 2d 21 (1977).

^{13/} Hush-A-Phone Corporation v. U.S. and FCC, 238 F. 2d 266 (1956); Telecommunications Reports, October 11, 1977.

^{14/} In 1978 about one million telephones were sold. Brock, p. 249.

become highly competitive. The blurring of the line between data processing and data transmission also created potentially competitive markets on the boundaries of traditional telephone service.

The primary rationale for common carrier regulation in telecommunications services lies in a presumed natural monopoly in the provision of those services.^{15/} If the industry does not possess the expected monopoly characteristics, then rate-of-return regulation serves no purpose, and in fact imposes major costs without compensating benefits.^{16/} Thus a strong case can be made for removing regulation from markets that could be competitive, and a fortiori for refraining from extending regulation to markets for new goods and services that might be competitively provided.

At the same time, economists have recognized that a monopolist who also participates in a competitive market may have additional opportunities to exploit its monopoly power. For instance, a monopolist may find it profitable to require purchasers of its monopolized product to purchase from it a related product that is produced competitively. Such tying allows the monopolist to

^{15/} Alfred E. Kahn, The Economics of Regulation: Principles and Institutions (New York: John Wiley & Sons, 1970), pp. 127-128; F.M. Scherer, Industrial Market Structure and Economic Performance (Chicago: Rand McNally, 1980), p. 482.

^{16/} An extensive literature exists concerning the costs of regulation. See for example Bruce M. Owen and Ronald Braeutigam, The Regulation Game: Strategic Use of the Administrative Process (Cambridge, Mass.: Ballinger Publishing Co., 1978); Paul L. Joskow and Roger G. Noll, "Regulation in Theory and Practice: An Overview," Social Science Working Paper no. 213, (California Institute of Technology, Division of the Humanities and Social Sciences, May 1978); Sam Peltzman, "Toward a More General Theory of Regulation," Journal of Law and Economics 19 (August 1976): 211-240; Richard A. Posner, "Theories of Economic Regulation," Bell Journal of Economics and Management Science 5 (Autumn 1974): 335-358; Roger G. Noll, "The Behavior of Regulatory Agencies," Review of Social Economy 29 (March 1971): 15-19; Richard A. Posner, "Taxation by Regulation," Bell Journal of Economics and Management Science 2 (Spring 1971): 22-50; and George J. Stigler, "The Theory of Economic Regulation," Bell Journal of Economics and Management Science 2 (Spring 1971): 3-21.

take account of any interdependence in the demands for the two products in pricing them and thus to increase its profits over those that could be gained by pricing the products separately.^{17/} Tying may also allow the firm to practice price discrimination, that is, to charge customers who value the service more highly a higher price than those who value it less.^{18/} Brock notes that if consumers who have several telephones value telephone service more highly than those who have only one, price discrimination may be accomplished by charging a relatively low price for monthly service but a high price for telephones.^{19/} Tying may also allow the firm to evade price controls if the price of the monopolized product is regulated but the price of the tied product is not.^{20/}

In the presence of regulation, simultaneous participation in competitive and regulated markets may have deleterious effects on the competitiveness of the unregulated market and on the efficiency of production. Averch and Johnson have shown that regulation that sets prices to achieve a target rate of return on capital gives regulated firms an incentive, when the target rate exceeds the cost of capital, to increase the amount of capital used in production beyond the optimal level.^{21/} Firms will have an incentive to increase the rate base by excessively substituting capital for

^{17/} Martin J. Bailey, "Price and Output Determination of a Firm Selling Related Products," American Economic Review 44 (March 1954): 82-93.

^{18/} W.J. Adams and Janet L. Yellen, "Commodity Bundling and the Burden of Monopoly," Quarterly Journal of Economics 90 (August 1976): 475-98; Ward S. Bowman, Jr., "Tying Arrangements and the Leverage Problem," Yale Law Journal 67 (November 1957): 19-36.

^{19/} Brock, p. 237.

^{20/} Bowman, pp. 21-23.

^{21/} Harvey Averch and Leland L. Johnson, "Behavior of the Firm Under Regulatory Constraint," American Economic Review 52 (December 1962): 1052-69.

labor or, of particular interest here, by expanding into new lines of business that would not otherwise be profitable. Thus the firm's output will be produced by less efficient techniques than otherwise, and consumers will pay higher rates as a consequence.

An extension of this phenomenon may occur if the regulated firm participates in both regulated and unregulated markets. In this case, if the firm can allocate costs of production in the unregulated market to the regulated market, it can price below its true cost in the unregulated market, undercutting its competitors in that market. In the extreme case the regulated firm could drive out its competitors in the unregulated market, then raise its prices and reap monopoly profits in that market. Of course if new entry were possible in the unregulated market the threat of further competition could prevent the maintenance of supracompetitive prices. Even so, the ability to price below costs in the unregulated market could permit the regulated firm to achieve a larger market share than otherwise would be efficient, at the expense both of more efficient competitors, and of ratepayers in the regulated market, whose rates would include a subsidy of production in the unregulated market.

This analysis suggests that allowing AT&T to participate in both competitive markets and regulated monopoly markets would provide opportunities for abuses of monopoly power and circumvention of regulatory constraints. On the other hand, to the extent that AT&T possessed unique technical competence in the provision of various competitively-provided services, excluding it from the competitive market would deprive consumers of the services of an efficient provider, thus increasing the price or reducing the quality of the service, and would reduce competition in the provision of the service. Regulating AT&T's competitive operations but not those of its competitors would impose

burdens on AT&T that would increase its costs and decrease its flexibility to respond to the market, and so would prevent it from providing services, and competing, as effectively as it otherwise could do.

D. Regulatory Responses

Regulators and antitrust authorities faced the dilemma described above in the late 1970's. The FCC attempted to solve the problems associated with AT&T's operation in competitive data processing and terminal equipment markets in its 1980 Computer II decision. The Consent Decree entered into by AT&T and the Department of Justice in 1982 imposed a further solution encompassing interexchange service as well.

Computer II. In the Computer II decision the Commission concluded that it would be undesirable to preclude common carriers from offering data processing activities and other sophisticated services, but insisted that safeguards were necessary to protect competitors and ratepayers from cross-subsidies and other abuses of monopoly power. The Commission's solution was to distinguish basic services, which consisted essentially of the provision of communications capacity, from enhanced services, which encompassed all additional functions.^{22/} The Commission permitted AT&T to offer enhanced services on a detariffed basis, but required that they be provided through a

^{22/} The Computer II decision states, "Basic service is limited to the common carrier offering of transmission capacity for the movement of information, whereas enhanced service combines basic service with computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information, or provide the subscriber additional, different, or restructured information, or involve subscriber interaction with stored information." 77 F.C.C. 2d at 387. The decision also states, "In offering a basic transmission service...a carrier essentially offers a pure transmission capability over a communications path that is virtually transparent in terms of its interaction with customer supplied information." Id. at 420. Both local and interexchange transmission were considered basic services.

completely separate subsidiary.^{23/} The regulatory structure for basic services remained unchanged. Thus underlying communications capacity could be provided to the subsidiary by the parent company only on a tariffed basis, on the same terms offered to other enhanced service providers. The basic services provider could not offer code and protocol conversion or storage functions. The enhanced services subsidiary was required to employ separate operating, marketing, installation, and maintenance personnel, to advertise separately, to be housed in separate locations, and to use separate computer facilities and, in most cases, separate software. Administrative services, support services for sophisticated terminal equipment, and results of research and development activities could be obtained from the parent company on a compensatory basis. Certain information needed by enhanced services providers, including some technical information and customer proprietary information, had to be disclosed to all other enhanced service providers on the same terms as to the underlying carrier's subsidiary. The Commission stated that the separate subsidiary requirement would limit the carrier's ability to engage in cross-subsidization primarily by reducing the level of joint and common costs which are subject to misallocation between basic and enhanced services. The decision also required separate sets of books for the parent and the subsidiary, which would facilitate detection of any cross-subsidies, and publication of rates and terms on which services were required to be offered to all. The Commission stated, however, that accounting

^{23/} The decision originally applied to AT&T and GTE; it was later modified to apply solely to AT&T. 84 F.C.C. 2d 50 (1980). A modified separate subsidiary requirement has been imposed on the BOC's. Memorandum Opinion and Order in Common Carrier Docket No. 83-115, FCC 83-552, adopted Nov. 23, 1983, released Dec. 30, 1983.

procedures alone would be inadequate to prevent misallocation of joint and common costs.

The Commission chose the basic/enhanced dichotomy to differentiate between regulated and unregulated services because this boundary limited the scope of regulation to a minimum core of monopoly services, leaving as much of the market as possible competitive and unregulated. The distinction between basic and enhanced appeared less arbitrary than other alternatives and less likely to be affected by future technological changes. Since all enhanced services were treated similarly, a package of services could be tailored to meet customers' needs without concern for differential regulatory treatment. An underlying premise of the Computer II decision was that regulators would be able to draw a clear distinction between the two types of service.

The Commission chose to deregulate terminal equipment entirely, noting that the market for such equipment appeared to be competitive. The Commission required that terminal equipment be provided on a detariffed basis, unbundled from other services, and removed from the rate base. AT&T was required to provide any CPE it offered through a separate subsidiary. This procedure treated CPE provided by carriers and non-carriers similarly, and would permit the market for terminal equipment to evolve competitively. Removing all CPE from regulation avoided the tariffing of data processing functions performed by terminal equipment or the establishment of arbitrary distinctions among types of terminal equipment. The Commission noted that bundling of CPE with transmission services restricted consumers' freedom to choose among types of terminal equipment and reduced their ability to choose the most desirable combination of products. Under existing ratemaking procedures some charges for CPE were included in interstate rates, so that bundling of CPE distorted interstate rates, causing them to diverge

inefficiently from costs and possibly allowing predation in the terminal equipment market.

Modified Final Judgment. The MFJ's major requirement was the divestiture of the local operating companies from AT&T. Seven independent holding companies, groupings of the original Bell operating companies, were formed to provide local service. These new BOC's were prohibited from providing interexchange services or information services, and from manufacturing equipment.^{24/} They were also prohibited from discriminating among providers of these services. They were required, for instance, to provide interconnection to all interexchange carriers on the same basis as to AT&T, and were forbidden to discriminate in establishing and disseminating interconnection standards and in planning for new facilities. Discrimination among providers of information services, terminal equipment, and switching and transmission equipment was similarly prohibited. The BOC's were, however, permitted to distribute CPE obtained from other manufacturers and to provide directory advertising.

AT&T retained the functions not divested with the BOC's, including interexchange telephone service, Western Electric's manufacturing operations, and Bell Labs' research and development activities. Under the MFJ both the BOC's and AT&T were permitted to distribute CPE. AT&T was permitted to perform most information services, including remote-access data processing, but was excluded from electronic publishing for a period of seven years.

^{24/} Information services are defined as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information which may be conveyed via telecommunications." American Tel. & Tel. Co., 552 F. Supp. at 229. Whether information services are coterminous with enhanced services as defined in the Computer II decision is unclear.

Like the Computer II decision, the MFJ attempted to prevent the exploitation of monopoly power, or of regulation, in competitive markets. In imposing divestiture the MFJ implicitly concluded that regulation would not prevent cross-subsidization or other abuses. The complete severing of the ties between the BOC's and the rest of AT&T was a far more costly and disruptive, and potentially more effective, remedy than that provided by Computer II. Divestiture of the BOC's removes the ability to cross-subsidize between local monopoly services and competitive services, or otherwise discriminate in favor of AT&T's competitive services, and eliminates the incentive to do so as well.^{25/} The MFJ also differed importantly from Computer II in that, whereas Computer II treated interexchange transmission as a form of basic service, the MFJ grouped AT&T's interexchange service with its competitive services, thus making it possible to consider the competitiveness, and the regulatory treatment, of interexchange service independently of the treatment of local service.

By removing the monopoly local exchanges from AT&T, the MFJ may have removed the ability of AT&T to cross-subsidize or engage in other anticompetitive practices, and thus may have made the Computer II separate subsidiary requirement unnecessary or at least excessively restrictive. The remainder of this paper will consider the implications of the MFJ for the appropriate regulatory treatment of AT&T by the FCC.

^{25/} Lavey and Carlton argue that the prohibition of discrimination in the MFJ may have been excessive and unnecessary, since divestiture alone would effectively remove any incentive for the BOC's to discriminate in favor of AT&T. Warren G. Lavey and Dennis W. Carlton, "Economic Goals and Remedies of the AT&T Modified Final Judgment," Georgetown Law Journal 71 (1983): 1497-1518.

III. COSTS AND BENEFITS OF VERTICAL INTEGRATION

Provision of enhanced services and manufacturing and sale of CPE and other telephone equipment by AT&T are forms of vertical integration, an extension of the firm's activities from one stage of the production process into earlier or later stages. Economists generally believe that if the firm has no market power at any stage of production, vertical integration has no ill effects, and occurs because it provides opportunities for increased efficiency.^{26/} The standard example of technical efficiencies permitted by vertical integration is that of steel manufacture, where performing successive operations in one location allows economies in handling and reheating the metal. Firms may also integrate vertically to reduce uncertainty, integrating upstream in order to ensure a reliable source of supply or downstream into distribution if the quality of the distribution effort may have a major effect on sales.

Recently economists have interpreted vertical integration as a strategy to avoid the transactions costs associated with marketplace processes.^{27/} According to Williamson, much of this cost results from conflicting interests of the parties to the transactions and the opportunities for opportunistic behavior that may arise in some kinds of transactions. A

^{26/} Oliver E. Williamson, Markets and Hierarchies: Analysis and Antitrust Implications (New York: Macmillan, 1976), p. 115; Phillip Areeda and Donald F. Turner, Antitrust Law (Boston: Little, Brown and Company, 1978), pp. 194-97.

^{27/} See for instance Williamson (1976), pp. 82-105; Oliver E. Williamson, "The Vertical Integration of Production: Market Failure Considerations," American Economic Review 61 (May 1971): 112-123; Benjamin Klein, Robert G. Crawford, and Armen A. Alchian, "Vertical Integration, Appropriate Rents, and the Competitive Contracting Process," Journal of Law and Economics 21 (October 1978): 297-326; Oliver E. Williamson, "Transaction-Cost Economics: The Governance of Contractual Relations," Journal of Law and Economics 22 (October 1979): 233-261.

major advantage of internal organization is superior ability to evaluate and reward employees' behavior, and thus to provide incentives to pursue common, rather than conflicting, goals. Internal management can also resolve conflicts by fiat, which is often more efficient than the negotiations that would be required in a market transaction.

Williamson points out characteristics of transactions that make vertical integration desirable. Among these are the amount of transaction-specific investment, the degree of uncertainty, and the the frequency of transactions.^{28/} If production capacity is unspecialized, so that the identity of the parties to the transaction is unimportant, then alternatives in the market will provide a sufficient constraint to protect the interests of the parties. But if one or both parties must make investments that are specific to a given transaction, that is, that have little value in alternative uses, then the identities of the parties become important, and one or both of them may gain the power to extract concessions by threatening to end the relationship. An extreme example of such an investment might be building a plant in a location that would serve only one customer. The parties develop an interest in maintaining an ongoing relationship, and in maximizing their joint profit stream, but at the same time each has an interest in appropriating as much of that profit stream as possible to himself. The parties then may find it advantageous to integrate vertically to protect themselves from each other's opportunistic behavior.

Uncertainty increases the need to be able to adapt to unforeseen situations. Since all possible circumstances, and the obligations of the parties in every circumstance, cannot be specified, occasions for

^{28/} Ibid., p. 235.

opportunistic behavior arise. Particularly with transaction-specific investments, the mechanisms to work out potential conflicts become increasingly important as uncertainty increases. Elaborate contingency contracts might be employed to protect against opportunistic behavior, but they would limit the organization's flexibility to respond to new situations. By minimizing the need to consult with other, independent parties and to update previous agreements, vertical integration provides a structure that can respond sequentially to new circumstances as they arise. Rapid technological change, such as occurs in the telecommunications industry, provides the sort of uncertain environment that makes vertical integration attractive.

In choosing an organizational structure, the firm will attempt to minimize the sum of production and transaction costs. If transactions occur rarely, special arrangements to avoid transactions costs may be unjustified. Where the product is non-standard, so that the market does not provide sufficient protection, but transactions occur only occasionally, some flexible contract procedure, possibly utilizing arbitration, may be desirable. Where frequent but non-standard transactions occur, vertical integration reduces contracting and monitoring expenses and provides greater adaptability. But unless the scale of production is appropriate, vertical integration may not allow realization of the available economies of scale in each activity. The choice between bilateral and unified governance mechanisms may thus depend on whether the production process is sufficiently specialized to a given transaction that the firm can realize all economies of scale.

Students of organization have noted that internal organization also entails inefficiencies. Among them are an excessive tendency toward internal expansion and procurement from internal sources, a tendency not to admit

mistakes and to persist in unprofitable activities, and distortion of internal communication. As firms grow in size, internal groups may increasingly be able to pursue their own subgoals rather than the overall goals of the firm. Control of employees by management, and of management by stockholders, becomes more difficult. Relationships within the firm become more impersonal, lessening loyalty to the firm's goals. Many of these distortions are possible because without market transactions the firm has difficulty judging the efficiency of various activities. These inefficiencies tend to increase with the size of the firm and to place a limit on the extent to which vertical integration will replace market transactions.^{29/}

While the case for permitting vertical integration of a firm having no market power appears clear cut, the desirability of vertical integration of a firm possessing market power appears less so. On the one hand, vertical integration may remove some of the inefficiencies created by monopoly. For instance, economists have conventionally believed that a monopolist at one stage of production would have no incentive to expand its operations into other stages of production, since it could not increase its profits by so doing; all monopoly profits could be extracted at the monopolized stage. It has been shown, however, that downstream integration by a monopolist may increase the efficiency of production. If the monopolist's product is an input into another firm's product, and if there are substitutes for the monopolist's product, the artificially high price for the monopolized input may cause downstream firms to use more of the substitutes than otherwise would

^{29/} Williamson (1976), pp. 117-131.

be optimal.^{30/} If the monopolist enters the downstream market, it will be able to produce using the input according to its true marginal cost rather than the monopoly price, and will be able to produce at lower cost than its rivals.

In addition, economists generally recognize that in the case of bilateral monopoly inefficient outcomes often occur because of breakdowns or miscalculations in bargaining.^{31/} In addition, where a monopolized product is an input into another monopolized product, monopoly pricing at successive stages may exacerbate the distortions of price and factor utilization caused by monopoly. By eliminating these situations vertical integration may make both producers and consumers better off.^{32/}

At the same time, however, as noted above, vertical integration may provide a monopolist opportunities for further exploitation of its monopoly power. A monopolist, for instance, may eliminate competition in upstream or downstream stages by refusing to buy from or sell to rivals of its competitive operations. AT&T's refusal to allow other interexchange services to interconnect with its local exchanges provides an example. In such cases vertical integration is equivalent to tying, and in fact the prohibition of tying under the antitrust laws may create an incentive for firms with market

^{30/} Vernon and Graham point out that the downstream firm could pay the monopolist a lump sum equal to its profit to be allowed to buy at marginal cost and still be better off. John M. Vernon and Daniel A. Graham, "Profitability of Monopolization by Vertical Integration," Journal of Political Economy 79 (July/August 1971): 924-25.

^{31/} Bilateral monopoly provides an extreme example of the situation of transaction-specific investment described above.

^{32/} Scherer, pp. 299-301.

power to integrate vertically.^{33/} If the monopolist buys only from its subsidiary when other firms have lower prices for similar products, it will raise its costs and may subject itself to the threat of entry. Entry, of course, will not occur as long as the monopoly is maintained by law or regulation. But then it is government sanction of the monopoly, not the underlying market structure, that permits the abuse to occur.

A vertically integrated monopolist may also subject a rival to a price squeeze by raising the price of a monopolized input used by a rival and maintaining a relatively low price on a competitive final product. If the monopolist underprices its rivals, it may be able to expand its market share and, in an extreme case, extend its monopoly to the second product. Ordinarily such a strategy would require the firm to engage in predation, that is, to accept current losses or lower current profits in the expectation of higher profits in the future. Predatory behavior is considered rare, however, because of the uncertainty that future profits will outweigh current forgone earnings, particularly if new entry is possible.^{34/}

A monopolist, however, might find it profitable to charge lower-than-competitive prices for one of two reasons. First, it might have lower costs because it could avoid the input distortions caused by monopoly pricing. In this case, production would be more efficient, but if the firm succeeded in monopolizing the downstream industry output would be restricted, so that the effects on prices, and on consumer welfare, are unclear.^{35/}

^{33/} Roger D. Blair and David Kaserman, "Vertical Integration, Tying, and Antitrust Policy," American Economic Review 68 (June 1978): 397-402.

^{34/} Areeda and Turner, p. 152.

^{35/} Richard Schmalensee, "A Note on the Theory of Vertical Integration," Journal of Political Economy 81 (March/April 1973): 442-49; Frederick R. Warren-Boulton, "Vertical Integration with Variable Proportions," Journal of Political Economy 82 (July/August 1974): 783-802.

Second, a regulated monopolist may be able to cross-subsidize its competitive operations from its regulated ones. In this case production inefficiencies would occur because the monopolist would expand more than optimally in the competitive market, and because rates would be higher, and output lower, than optimal in the regulated market. This strategy would be profit maximizing as long as regulated rates could be kept above competitive levels.

For either of these strategies to have a negative effect on the welfare of consumers of the downstream product, barriers to entry must exist in the market for the non-monopoly product. Otherwise when the monopolist raises its prices above the competitive price other firms will be attracted by the prospect of high profits and will enter, offer lower prices, and attract customers away from the original firm. The monopolist will then be forced to reduce its prices to the competitive level.^{36/}

In general, then, vertical integration of itself appears to have no ill effects if the firm has no market power, and permitting it to occur appears desirable because it allows the firm to take advantage of the transactional efficiencies it affords. These are especially great if there are investments that have poor alternative uses, if the environment is uncertain, and if recurrent transactions are expected. If the firm has market power, however, the effects of vertical integration may be mixed. On the one hand, vertically integrated production may prove more efficient than either bilateral monopoly or independent production with monopolistic price distortions; on the other hand it may provide opportunities for a monopolist to extend its market power. A monopolist may have incentives to integrate vertically, either because it can circumvent monopolistic price distortions or

^{36/} Areeda and Turner, p. 152.

because of the cross-subsidies available under rate-of-return regulation. The former increases the efficiency of production but may or may not increase prices; the latter results in expansion beyond the optimal level in the competitive product market and increases rates in the regulated market. If entry is possible, however, the monopolist will be unable to maintain prices above the competitive level in the competitive market, and will be unable to recoup losses incurred through predation.

IV. VERTICAL INTEGRATION AND AT&T

A. Costs of the Separate Subsidiary Requirement

The above discussion suggests that vertical integration may yield benefits in organizational efficiency and thus that efficiency costs are imposed by rules such as the Computer II separate subsidiary requirement that prohibit such integration. Such rules should be imposed only if their costs are less than the costs of the anticompetitive abuses they are intended to prevent, and then only if reasonable certainty exists that the rules are effective in preventing those abuses.

The separation imposed by Computer II affects telecommunications service in three ways: by separating CPE from the switched network, by separating provision of enhanced and basic services, and, in practice, by separating manufacture from sale of equipment. Since CPE is more commonly connected to the local exchange than to interexchange lines, the first of these has far more importance for policy toward the BOC's than for AT&T.

The separation of enhanced from basic services may, however, impose transactions costs on AT&T that could be eliminated through vertical integration. As discussed above, such costs are likely to be greatest where

uncertainty is great, where transaction-specific investment is large, and where frequent transactions occur. In telecommunications, rapid technological change creates uncertainty concerning both the best technology for a given application and the market for new services. Competitive firms find rapid response to new information extremely important in such an environment. The necessity for contractual negotiations between a carrier and an enhanced service provider--in this case AT&T Communications (ATTCOM) and AT&T Information Services (ATTIS)--could create major delay and cause a severe competitive handicap. For routine operations acquiring service under tariff may cause little inefficiency. But for any complicated installation, particularly of an innovative service, the parties would have to agree upon many details which could not be foreseen and would not be adequately covered by tariff. AT&T might find the consequent delay particularly harmful since its competitors, who can use their own unregulated facilities, face no similar obstacles, and since slowness to introduce new products and services is believed to be one of the major marketing problems of AT&T's unregulated businesses.^{37/}

Installation of an enhanced telephone service may also require large investments that have little or no value in other uses, particularly if it involves equipment that is specialized to a particular application or location, and thus may give the enhanced service provider and the underlying carrier, ATTIS and ATTCOM, considerable bargaining power relative to each other. It also involves long-term relationships with repeated transactions. These circumstances suggest that the parties would be likely to find vertical

^{37/} Business Week, July 5, 1982 and September 5, 1983.

integration a highly desirable and efficient form of organization to protect against opportunistic behavior and avoid contracting costs.

The distinction drawn by Computer II between basic and enhanced services is, from a technical point of view, arbitrary. Many functions can be performed equally well within the basic communications network or at the customers' premises, and in some cases what is defined as an enhanced function may be performed more efficiently within the network than at a terminal. Inefficiencies may result because engineers for ATTCOM face artificial incentives to design services to fit within the definition of basic service.

Protocol conversion, which adapts signals formatted for use with one computer system so that they can be processed by an incompatible system, provides an example.^{38/} Changing the protocol of the subscriber's transmitted information, unless it is performed internally to a carrier's network and does not modify the output, is considered an enhanced service under Computer II. In otherwise-basic packet-switched services, efficient switching between networks requires protocol conversion. Reverting to restore the signal to its original form, in order to make it conform to the definition of a basic service, would be technically unnecessary and inefficient.^{39/} The alternative of requiring a separate entity to provide protocol conversion would also be inefficient if it entailed substantial transactions costs. The problem is

^{38/} The Computer II Final Decision defined protocols as follows: Protocols govern the methods used for packaging the transmitted data in quanta, the rules for controlling the flow of information, and the format of headers and trailers surrounding the transmitted information and of separate control messages. 77 F.C.C. 2d at 420, n. 33.

^{39/} See Memorandum Opinion, Order, and Statement of Principles in General Docket No. 80-756, adopted November 8, 1983, released December 2, 1983.

likely to be exacerbated by the fact that with divestiture few interstate calls are completed by a single end-to-end carrier, so that network-to-network switching will become much more frequent than in the past.^{40/}

Transition to a new technology may also necessitate protocol conversion in a basic service. For instance, a call made from CPE using an analog protocol interface to CPE using a digital interface would require protocol conversion. A policy that hindered such conversions would increase the cost and might deter the introduction of new technology in basic services.^{41/} ATCom's services would be likely to become technically less advanced and more costly than those of its competitors.

The boundary between basic and enhanced services might be moved to allow basic services to encompass protocol conversion. But clearly a continuum of data or protocol conversions exists ranging from those that are necessary to complete a basic call, such as tone-to-pulse dialing signal conversions, to pure data processing. Equally difficult issues may be expected to arise with any boundary that might be chosen.

Furthermore, the definition of basic service is based on the service customarily provided with existing technology. As the cost of electronic technology falls, basic service providers will have continuing incentives to offer additional features as a part of standard service. Multiple addressing and electronic mailbox service, for instance, are services that might be attractive and that do not involve extensive data processing, but that are

^{40/} Telecommunications Reports, January 9, 1984.

^{41/} The Commission's current policy of requiring waivers for offering protocol conversion as part of a basic service leaves considerable uncertainty concerning fundamental Commission policy. A U.S. West spokesman states that carriers "cannot be expected to define, plan, and implement basic network architecture through a series of waiver requests." Ibid.

prohibited by Computer II. The cost of such additional features may be low relative to the cost of the separate subsidiary requirement, and thus the requirement may hinder the introduction of technological innovations in basic service. The requirement may constitute a competitive handicap, since AT&T's competitors will be able to offer such services as a single entity, and it may deprive consumers of desirable services. As basic service technology changes the Commission will continue to face waiver requests from the BOC's as well as from ATTCOM, requiring redefinition of the basic/enhanced boundary.^{42/}

Separation of equipment manufacture from equipment sales, which occurs now with the separation of ATTIS, AT&T's end user marketing organization, from AT&T's manufacturing organizations, will also impose costs on AT&T. The end-user equipment industry is characterized by a volatile competitive market and rapidly changing technology, and AT&T's marketing and manufacturing arms have few or no alternatives to dealing with each other. Again, these characteristics suggest the desirability of vertically integrated organization to minimize transactions costs and to facilitate adaptation to change.

In fact, to adapt to competitive markets AT&T has undergone a major reorganization, replacing its Western Electric manufacturing operation with a new corporation, AT&T Technologies, Inc., organized on a line-of-business basis. Under the new structure a single organization will be accountable for a product through research, manufacturing, and marketing, which is expected to make possible more rapid responses to customers' needs. The Computer II requirement has prevented integrating ATTIS, AT&T's end user marketing

^{42/} The Commission has already recognized the awkwardness of a separations policy in some cases, for instance in granting a waiver permitting Michigan Bell to offer Miss Dig service, which combines basic service with storage and forwarding, on an unregulated basis without separation. Telecommunications Reports, January 16, 1984.

organization, into the new structure. Press reports indicate that ATTIS has not been incorporated into the new structure because moving manufacturing facilities into ATTIS under the separation requirement would increase cost, inventory, and interplant systems. The most serious restrictions are believed to be those involving use of software.^{43/} At the same time the separation of ATTIS from the manufacturing functions is reported to exacerbate conflicts between sales-oriented and production-oriented organizations.^{44/}

The above discussion makes clear that the Computer II decision imposes real costs on the customers of the telecommunications industry. While the magnitude of these costs is unclear, it is clear that some benefit must be forthcoming from the separate subsidiary requirement to justify its continued existence.

B. Likelihood of Abuses of Integrated Organization

Possible means of extending monopoly power or circumventing regulation through vertically integrated organization were discussed above. These included tying and various strategies involving underpricing rivals in competitive markets.

One concern underlying the Computer II requirements was that a carrier with market power might tie the purchase of a competitively or potentially competitively supplied product to the purchase of its monopoly product. AT&T in fact has a history of refusing to interconnect either CPE from other sources or non-AT&T interexchange services to the local network.

^{43/} Telecommunications Reports, Dec. 19, 1983.

^{44/} Bro Uttal, "Western Electric's Cold New World," Fortune, June 27, 1983, pp. 81-84.

Independently of Computer II, however, the Hush-A-Phone and subsequent decisions have required nondiscriminatory interconnection of independently-supplied CPE, and Commission and Court decisions have clearly required the interconnection of the OCC's. Refusal to interconnect has, in recent years, been associated with the local exchanges rather than with interexchange service in any case. Because there are now substitutes for AT&T's interexchange lines, even if it chose to refuse service the power it could wield would be limited at best.

Three other scenarios were described above in which a monopolistic firm would have an incentive to expand into downstream markets. In one case a dominant firm might engage in predation, pricing below cost to drive other firms out of the industry. In the second case the firm could produce more efficiently than its rivals in the downstream market because it could avoid monopolistically-created factor-price distortions. AT&T could conceivably face this situation in the provision of enhanced services, since regulated basic service is a necessary input. In the third case a regulated firm could expand its rate base by shifting costs from an unregulated, competitive market to a regulated market. In none of these cases would consumer prices rise above the competitive level, or welfare of consumers be adversely affected, in the unregulated market as long as free entry was possible in that market. If the unregulated market were competitive, the only adverse effects of concern would be those resulting from cross-subsidization from the regulated to the unregulated market. These effects would consist of further-than-optimal expansion into the unregulated market and consequent resource misallocation, and excessively high rates in the regulated market. None of the above scenarios could occur, and vertical integration would permit no abuse of

power, if either regulation or competition in the regulated market prevented regulated rates from rising above the level justified by real economic costs.

AT&T's unregulated markets. The markets for CPE and enhanced services, and other unregulated markets AT&T may enter, are potentially affected, as described above, by AT&T's market power in its regulated market. Most evidence indicates, however, that these markets are highly competitive.

Entry into the manufacture of terminal equipment appears fairly easy. The technology is widely available and, as noted earlier, economies of scale are apparently sufficiently small, even with conventional equipment, to make competition feasible. With electronic equipment economies of scale appear to be exhausted at lower volumes, and product lifetimes are shorter, so that entry appears even easier.^{45/} The North American Telecommunications Association (NATA) estimates that there are between 2,000 and 2,500 telephone equipment vendors in the United States, and points out that an important characteristic of the industry is "rampant price competition resulting from an overabundance of vendors."^{46/} More than fifteen American and foreign companies now offer PBX's in the United States.^{47/} In office automation, where successful entry into the market appears to require both computer and communications technologies, joint ventures across industry boundaries have occurred. Among these are IBM-Rolm, Honeywell-Ericsson, and Olivetti-CIT-

^{45/} Ibid., p. 82.

^{46/} North American Telecommunications Association, 1983-1984 Telecommunications Source Book, p. 106.

^{47/} Business Week, December 5, 1983.

Alcatel.^{48/} Foreign companies, including Northern Telecom, NEC, and Ericsson, which have acquired technical expertise and high-volume production lines serving foreign markets, are entering U.S. markets both for CPE and for central office equipment. Consequently many of the firms against which AT&T must compete in equipment manufacture are already powerful entities with proven abilities in the relevant markets.

Despite its initial large market share, AT&T faces several competitive disadvantages in the sale of terminal equipment. By most accounts AT&T's products have high quality but are high-priced and lack features offered by competitors. AT&T has been slow to introduce new products-- development and introduction of a product typically requires three years, as compared with one year for TIE/communications, for instance--and many of its products embody relatively old technology.^{49/} AT&T has been unable to produce a full competitive product line. In fact, in mid-1983 about 20 percent of ATTIS's products, including all cordless telephones, were manufactured by other companies.^{50/} AT&T also has a small sales force and very little experience in marketing. These problems appear to stem from AT&T's history as a regulated monopoly and may disappear after a transition period, but in the meantime AT&T very well may lose whatever advantages its original market share and experience conveyed.^{51/}

^{48/} Ibid.

^{49/} Business Week, November 14, 1983.

^{50/} Steven Flax, "The Orphan Called Baby Bell," Fortune, June 27, 1983, pp. 87-88.

^{51/} Press reports suggest that in fact attempts to reorient AT&T to respond to the market have precipitated a "clash in corporate culture" between manufacturing and marketing personnel, and that the success of the transition remains in doubt. Wall Street Journal, February 13, 1984.

As a consequence, AT&T's market share in the sale of CPE has declined rapidly. In 1978 non-AT&T companies accounted for an estimated 51 percent of PBX shipments; by 1982 an estimated 61 percent of such shipments came from non-AT&T sources. NATA predicts that their share of shipments will increase to 72 percent by 1987. Similarly, the non-AT&T share of shipments of key sets rose from 27 percent in 1978 to 57 percent in 1982, and is projected to increase to 75 percent by 1987.^{52/}

AT&T also faces stiff competition in the sale of central office equipment. Northern Telecom is estimated to have has 60 percent of the U.S. independent telephone company market for central office switches and expects to have a 35 percent share of the BOC market by 1986, equalling AT&T's share of the BOC market.^{53/}

Many companies offer enhanced services in competition with AT&T. Business Week notes that since basic communications service is increasingly becoming a commodity sold on the basis of price, providers are increasingly offering value-added services to differentiate their products from their rivals'.^{54/} With basic communications capacity available for resale, entry into the enhanced-services market appears relatively easy. At least five companies have value-added networks. Though the other vendors are small relative to AT&T--they expected combined revenues of \$320 million in 1983--they have been growing rapidly.^{55/} Telenet's revenues grew by more than 50

^{52/} NATA, Source Book, pp. 109-121.

^{53/} Business Week, Dec. 5, 1983.

^{54/} Business Week, October 11, 1982.

^{55/} U.S. Department of Commerce, Bureau of Industrial Economics, 1984 U.S. Industrial Outlook: Prospects for over 300 Industries, January 1984, p. 46-2.

percent annually from 1979 through 1982; Tymnet planned to add 150 cities to its network in the first half of 1983, enabling it to serve most locations with more than 85,000 population.^{56/}

AT&T also has entered or plans to enter other markets from which it was originally barred, including semiconductors, computers, and foreign telephone equipment markets. Since the domestic markets were competitive prior to AT&T's entry, AT&T will almost certainly have no market power in them, and in fact the addition of a further competitor may heighten competition in these markets.

In sum, AT&T's unregulated markets appear highly competitive. If competition is as great as it appears to be in these markets, no danger exists that AT&T could exercise market power to raise prices. In fact it appears that in CPE AT&T is losing market share, and its absolute share is low, in part because its prices are above competitive market prices for similar equipment. Even if manipulation of market power or regulation in the interexchange market could give AT&T a larger market share than it otherwise would enjoy in the unregulated markets--that possibility is considered in the following section--consumers in those markets will almost certainly not be adversely affected.

The regulated interexchange market. Since the MFJ completely severed the relationship between the BOC's and the remainder of AT&T, the apparent natural monopoly of the local exchanges, which caused concern at the time of the Computer II decision, is now irrelevant to AT&T's provision of unregulated services or other behavior. The remaining issue, then, is the effect of whatever market power AT&T retains in the provision of long-distance

^{56/} Telecommunications Reports, February 28, 1983; Standard & Poor's Corporation, "Standard Corporation Descriptions," February 1983, p. 8706.

service. The possibility of some ill effects from cross-subsidy remains as long as AT&T retains market power in that market. The interexchange market, however, is clearly moving in the direction of increased competitiveness.

At least ten other common carriers (OCC's) offer long-distance service in competition with AT&T--often at rates 30 to 50 percent lower than AT&T's on popular routes.^{57/} AT&T's share of interexchange common carriage has fallen from almost 97 percent in 1981 to 93 percent at the end of 1983.^{58/} These figures undoubtedly overstate AT&T's share of long-distance service since they exclude private systems, which provide an increasing share of telecommunications service. AT&T spokesmen state that competitors have captured as much as 25 percent of the long-haul business in the heavy-use market they target--residential users with long-distance bills greater than \$25 a month and business users with long-distance bills greater than \$50 a month. These two classes account for 85 percent of AT&T's combined business and residential revenues.^{59/}

While AT&T's share of the interexchange market remains large, competitors have grown, and continue to grow, at a remarkable rate. The revenues of MCI, the largest of the OCC's, grew by 62 percent in fiscal year 1981, 116 percent in 1982, and 112 percent in 1983. In 1983 MCI's domestic commercial customer base increased 48 percent and the number of residential subscribers increased 64 percent.^{60/} Many securities analysts predict MCI's

^{57/} Business Week, Oct. 11, 1982.

^{58/} Business Week, January 25, 1982; October 10, 1983.

^{59/} Communications Week, January 30, 1984; Telecommunications Reports, December 5, 1983.

^{60/} MCI Communications Corporation, MCI Annual Report 1983, pp. 4, 18.

earnings will grow at least 30 per cent per year for the next five years.^{61/} Drexel Burnham Lambert predicts that MCI's market share will grow to 20 percent by 1990, and that AT&T's will fall to 65 to 75 percent.^{62/} Other OCC's, though they entered the market later, have grown similarly. As a result of such growth, these firms are large on an absolute scale. MCI had sales of \$1.07 billion in fiscal year 1983, and served 1.3 million customers.^{63/} The eight largest OCC's report that their annual revenues total about \$2 billion and are projected to increase to about \$4.5 billion in 1984.^{64/} Further, the OCC's have aggressive investment plans and expect major expansion of their capacity in the next few years. MCI plans to invest \$1.1 billion in capital expansion in the 1984 fiscal year, and GTE plans to invest \$1 billion in its Sprint long-distance and satellite operations in 1984. By comparison, AT&T forecasts that its total construction expenditures for 1984, for both AT&T Communications and AT&T Technologies, and including expenditures for plant replacement and modernization and customer movement, will amount to only \$3.8 billion.^{65/} If the OCC's continue such growth, AT&T's dominance in the interexchange market clearly cannot survive.

Not all long-distance competition comes from the OCC's. A large number of organizations use private microwave systems, entirely bypassing the

^{61/} Prudential-Bache, "MCI Communications: Company Update," August 5, 1983; Steven G. Chrust, "MCI Communications Corporation," Sanford C. Bernstein & Co., Inc., August 30, 1983.

^{62/} Telecommunications Reports, November 28, 1983.

^{63/} MCI Annual Report, p. 4.

^{64/} The projection assumes favorable regulatory treatment. Letter to Chairman Fowler re: CC Docket No. 78-72, Phase I, October 4, 1983.

^{65/} Telecommunications Reports, October 17, 1983 and February 20, 1984; AT&T, Information Statement and Prospectus, November 8, 1983, p. 42.

telephone network. In addition, an extensive market has arisen in the resale of communications capacity. U.S. Telephone Communications, the largest reseller, had revenues of \$135 million in fiscal year 1983.^{66/} In some cases companies in other industries resell excess capacity as a sideline; in other cases buying bulk communications and repackaging it is a primary function. Resale of AT&T's capacity provides an arbitrage function, allowing small users to take advantage of bulk rates and limiting AT&T's ability to charge discriminatory rates.

While the OCC's primarily use microwave technology, satellites also provide a major source of long-distance communications capacity. At least seven satellite carriers provide such service. Fiber optic lines can also provide long-distance communications service at competitive prices. Both of these technologies are readily available to providers other than AT&T. MCI, CSX-SNET, and GTE have all begun to install fiber optic lines.^{67/} MCI will soon have 24 satellite transponders and has begun installation of 4000 miles of fiber optic cable.^{68/}

Little enough is known with certainty about competitors' costs relative to AT&T's to make any statement about the long-run competitiveness of the market hazardous. AT&T enjoys higher volume, so that it can take advantage of any economies of scale; on the other hand it is believed to use excessively capital-intensive techniques and to have been slow to innovate. The OCC's have newer, lower-cost plant, higher capacity utilization, and lower financing costs because they enjoy a higher return on equity. Security

^{66/} Telecommunications Reports, January 9, 1984.

^{67/} Business Week, Sept. 12, 1983.

^{68/} Business Week, Oct. 10, 1983.

analysts estimate that with equal access charges MCI's costs will be 15 to 20 percent below AT&T's.^{69/} The newer technologies, microwave, satellite, and fiber optic, are equally available to all users. To the extent these are equivalent or superior to traditional service, AT&T has no competitive advantage over other providers.

On low-volume routes AT&T may retain considerable market power because economies of scale in microwave and other competing technologies are too great to make competition on such routes profitable. Nationwide rate averaging, however, probably makes most of these routes unprofitable to serve. Many of these lines have been assigned to the BOC's in the divestiture process, and in any case they probably represent only a small percentage of traffic and of revenues.

It is possible that the entry and growth of competitors in the interexchange market results from artificially high regulated interexchange rates, due in part to the subsidy of local service by long-distance service, rather than from lower costs. Access charges, moving rates closer to the cost of service, will, if and when they are introduced, reduce the OCCs' rate of growth.^{70/} There appears no reason to believe, however, that on routes carrying most traffic the OCC's costs would rise above AT&T's.

The post-divestiture remainder of AT&T retains only a fraction of the assets of the old Bell System. In 1983 the BOC's accounted for 78 percent of AT&T's assets and 48 percent of its revenues.^{71/} Thus even if AT&T had an

^{69/} Prudential Bache, "MCI Communications: Company Update," May 18, 1983; Steven G. Chrust, "MCI Communications Corporation," Sanford C. Bernstein & Co., Inc., Oct. 11, 1982.

^{70/} This assumes that the current difference in the access charges paid by AT&T and the OCC's does not perfectly reflect the difference in the quality of interconnection they receive.

^{71/} Calculated from AT&T, Prospectus, pp. 6-13, 44.

incentive to cross-subsidize its competitive businesses, its capacity to cross-subsidize would be greatly diminished simply because the regulated entity to which costs might be shifted, and the magnitude of the costs that might be shifted, are much smaller. In addition, the rapid decline of AT&T's market share in its regulated markets suggests that whatever market power it retains currently is likely to be transitory, and that almost certainly regulation based on the existing market structure will soon appear excessively restrictive. Furthermore, AT&T still faces intense scrutiny from antitrust authorities, which should prevent overtly anticompetitive behavior for the foreseeable future.

As discussed above, a regulated monopolist's incentive to shift costs from unregulated to regulated businesses exists because doing so provides a means of circumventing rate-of-return regulation and charging higher rates than regulators otherwise would allow. If raising rates would not increase the monopolist's profits, this incentive does not exist.

The characteristics of consumer demand for telephone service may prevent AT&T from charging above-competitive rates for interexchange service, independently of the rate-of-return constraint. A firm will find it profitable to raise its price only if the gains from increasing its price per unit exceed the losses caused by a reduction in the number of units sold. The more price elastic demand for a product is, that is, the more the quantity demanded falls as the price rises, the less a monopolist will be able to raise its price above cost. How much demand varies with price will depend, among other things, on whether close substitutes are available and on the price of the substitutes. In the case of interexchange telephone service it is plausible that the services of the OCC's would be perceived as much better

substitutes for AT&T's services than, for instance, telegrams, mail delivery, or personal travel.

Economic theory states that if the elasticity of demand is greater than 1 then the marginal revenue from selling an additional unit will be positive, and, provided marginal revenue is greater than marginal cost, it will pay to expand output, and reduce price, until marginal revenue equals marginal cost.^{72/} Estimates of demand elasticity for telecommunications service vary widely, but there is general agreement that price elasticities are low for access to the network and for local service and relatively high-- in the neighborhood of 1.0, by some estimates--for interexchange service.^{73/} These elasticities relate to the entire industry and thus reflect reduction in total use of telephone service as a result of a price increase. The elasticity of demand facing AT&T will be greater than the industry demand elasticity, in part because customers will have the option of shifting to

^{72/} The elasticity of demand is defined as the absolute value of the rate of percentage change of output divided by the rate of percentage change of price:

$$e = - \frac{dq/dp}{q/p} = - \frac{p}{q} \frac{dq}{dp}.$$

The monopolist's total revenue is given by $R = pq$. Then marginal revenue is:

$$MR = \frac{dR}{dq} = p + q \frac{dp}{dq}.$$

In terms of demand elasticity,

$$MR = p(1 + \frac{q}{p} \frac{dp}{dq}) = p(1 - \frac{1}{e}).$$

Thus MR is positive if $e > 1$, zero if $e = 1$, and negative if $e < 1$. James M. Henderson and Richard E. Quandt, Microeconomic Theory: A Mathematical Approach (New York: McGraw-Hill, 1971), pp. 208-211.

^{73/} Based on the empirical literature, Taylor gives subjective estimates of .75 for interstate toll minutes and .65 intrastate toll minutes. Most studies of interstate demand however, place the price elasticity around 1.0. Lester D. Taylor, Telecommunications Demand: A Survey and Critique (Cambridge, Mass: Ballinger, 1980), pp. 99, 122-124, 168-171.

other providers if AT&T's prices remain higher than their rivals'.^{74/} This suggests not only that AT&T retains much less power to cross-subsidize than do the BOC's, but that AT&T may have little or no power to raise prices in interexchange service to support a cross-subsidy in its competitive markets.^{75/}

Whatever AT&T's ability to cross-subsidize its competitive operations, the existing implementation of Computer II could not eliminate the possibility of cross-subsidy. While ATTIS is separated from both manufacturing and interexchange operations, manufacturing of network equipment and CPE take place on an unseparated basis, so that costs could be shifted from manufacture of CPE to network-equipment manufacture.^{76/} Then the price at which ATTIS acquired equipment for resale would already reflect the cross-subsidy, as would the cost of network equipment to AT&T Communications. Since most network equipment provided to AT&T Communications is also offered on the

^{74/} For a dominant firm, the elasticity of demand is given by

$$e_i^d = e_m^d/S_i + e_j^s(1 - S_i)/S_i$$

where e_i^d is the demand elasticity of firm i , e_m^d is the market demand elasticity, e_j^s is the elasticity of supply of competing firms, and S_i is the market share of firm i . The firm's ability to raise its price profitably decreases as its share of the market decreases and as the ability of other firms to expand in response to higher prices increases. William M. Landes and Richard A. Posner, "Market Power in Antitrust Cases," Harvard Law Review 94 (March 1981): 944-52.

^{75/} AT&T asserts, "The traditional response to earnings deficiencies--a general interstate rate increase, is not available to AT&T....an AT&T MTS rate increase would only accelerate AT&T's loss of revenue to the OCC's and could not possibly restore earnings to reasonable levels." Emergency Petition for Reconsideration, CC Docket No. 78-72, Phase I, CC Docket No. 83-1145, Phase I.

^{76/} Since Western Electric in 1983 would have accounted for 27 percent of the total assets and 20 percent of the sales of the divested AT&T, the opportunities for cross-subsidy would have been considerable. Calculated from AT&T, 1983 Annual Report: The New AT&T, Financial Section, p. 15, and AT&T, Prospectus, p. 6.

market, this effect would be limited by the need to offer that equipment at competitive prices. Requiring manufacture of closely-related equipment on a separated basis might result in large inefficiencies, and so would be costly and undesirable.

V. CONCLUSIONS

Ending the separate subsidiary requirement for provision of services in unregulated markets by AT&T would undoubtedly yield some technical and transactional efficiencies; the size of these benefits is difficult to estimate. Because the unregulated markets appear competitive, and entry into them appears easy, AT&T almost certainly will be unable to exercise market power in these markets. Commission decisions and antitrust rulings will prevent tying in these markets; the ease of entry makes predation unworkable. Any competitive abuses will result from remaining market power in the regulated interexchange market. This market, too, appears to be moving rapidly toward competition. Whether new providers have been able to enter and expand rapidly because of true cost advantages or because of the subsidy of local service that has artificially elevated AT&T's long-distance prices is unclear, and will remain so until the transition to cost-based pricing is completed. The newer technologies for interexchange service, however, are widely available to non-AT&T firms, and there is no apparent reason to believe that other firms would have higher costs than AT&T in using these technologies. The rapid expansion of interexchange competitors suggests that any remaining market power that AT&T possesses is transitory, and thus of less concern than if it were expected to persist. The high price elasticity of demand for interexchange service suggests that AT&T would be unable to raise prices substantially on interexchange service to cross-subsidize expansion of a competitive service.