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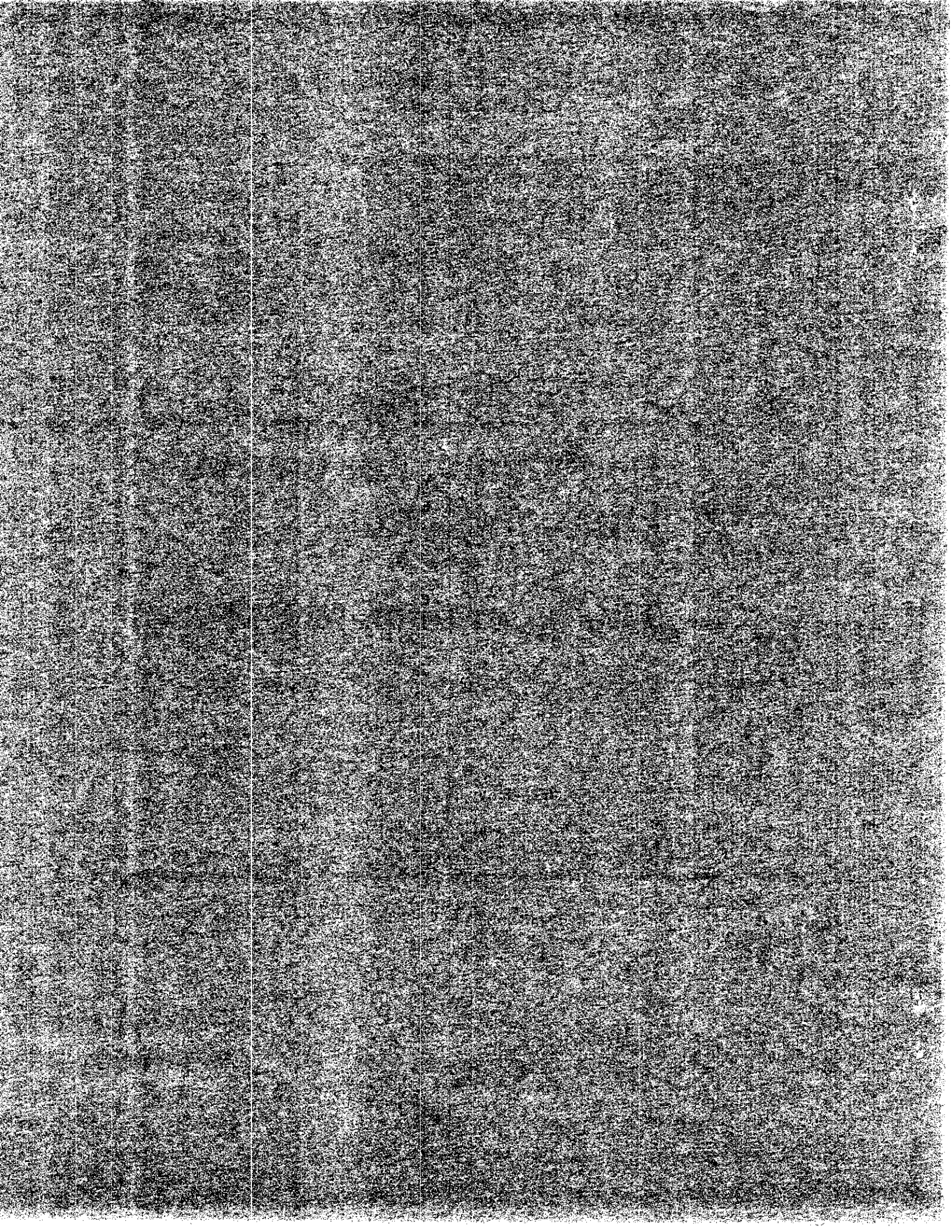
7 Negotiating For Improved Interconnection:

The Incentives to Bargain

January 1982

(revised April 1982)

Roy L. Morris
Robert S. Preece



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NEGOTIATING FOR IMPROVED INTERCONNECTION:
THE INCENTIVES TO BARGAIN

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ABSTRACT

The issue of determining the types and quality of interconnection between local telephone companies and other telecommunications firms is addressed. Instead of prescribing a detailed solution, a regulatory commission should establish ground rules for negotiations, i.e. "market rules." It must also establish the "starting point" from which bargaining can take place. A "starting point" for negotiations is the a priori property rights vested in the bargaining parties.

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The opinions expressed in this paper are those of the authors'. They do not necessarily reflect policies or views of the Federal Communications Commission or any other organization or individual.

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1 Executive Summary

1.1. Introduction

The U.S. telecommunications industry has long been characterized by a restricted entry, heavily regulated, multi-vendor environment. Each regulated vendor was explicitly or implicitly given an exclusive franchise to offer its services in a specified serving area. Deregulation of the industry and the most recent plan for the divestiture of AT&T have changed this pattern and increased the opportunity for entry by directly competing firms. New entrants, however, must deal with old-line vendors in order to survive. If a competitive and cooperative telecommunications marketplace is to develop, "market rules" must be established by governing authorities.¹ This paper proposes some market rules to govern the interconnection dealings between telecommunications firms.

The Need for A New Approach To Market Regulation

As a competitive telecommunications marketplace evolves, the interactions between firms (and their customers) will tend to become more complex and varied. This trend will make detailed regulatory oversight more and more difficult. The U.S. Federal Communications Commission (the "Commission") and the state public service commissions have to decide whether to control the

¹ A more general discussion of a "market rules" approach to regulation is found in: "The Conceptual Framework of Common Carrier Policymaking at the Federal Communications Commission in Recent Years: An Economist's Perspective", Jerry B. Duvall, Proceedings of the 1981 Rate Symposium on Problems of Regulated Industries, Columbia, Missouri: University Extension Publications, 1981. Also see: "Deregulation After Divestiture: The Effect of the AT&T Settlement on Competition," Dan Kelley, Office of Plans and Policy Working Paper No. 8, Federal Communications Commission, April 1982.

detailed evolution of these interactions or rely as much as possible on marketplace forces for relief of these oversight burdens. The choice of approach will have a critical effect on the ultimate viability and form of the competitive marketplace of the future.

In recent times, the Commission has chosen to carry out its oversight role by requiring cost support for tariffs and using adjudicatory type hearing proceedings. The continued sole reliance upon these tools will have many adverse side-effects which will fester as the transition to competition proceeds. The major problem with these tools are that they are slow and, for the most part, ineffective. They will have the net effect of stifling innovation in terms of offerings and, equally importantly, limiting the ways in which market participants deal with each other. Another adverse effect of sole reliance on these tools is that it may result in continued or increased regulation in the name of competition. Market participants will continue to look to the regulatory commission as a first resort, rather than a last resort, for resolving problems which could best be solved between the market participants themselves. The net result is that the Commission will continue to find itself caught in a regulatory quagmire.

At the opposite extreme is a laissez-faire approach. If regulatory history could be rewritten, this would be a viable approach.² History, however, cannot be rewritten; the Commission is faced with the fact that the local telephone company has a monopoly on access to most telephone subscribers. This local telephone bottleneck exists partially as a result of historical telecommunications regulation. It is well recognized that this

² For example, see Richard Gabel, "The Early Competitive Era in Telecommunications, 1843-1920," Law and Contemporary Problems 34 (Spring 1969), pp. 340-359.

bottleneck is the major obstacle to complete deregulation of the telecommunications industry because it gives the local telephone company the power to dictate the terms under which all telecommunications service providers may access most local customers.

In light of these facts, the Commission's oversight role during the transition to competition must focus on the local loop bottleneck. How this is best done is the subject of this paper. A middle of the road approach using increased reliance on bargaining is advocated for effective transitional regulation. Increased reliance on bargaining between the parties brings in marketplace forces to aid the Commission in its oversight responsibilities. This has the desirable characteristic of an economically efficient outcome subject to real world constraints posed by the local loop bottleneck.

Prescription of Objectives vs. Promotion of Incentives

In order to counter the anti-competitive opportunities available to the local loop supplier, non-discriminatory access to the local loop must be a guiding principle of any policy. Non-discriminatory access must not be taken to mean "the same access for all," for this would be might be as inefficient as the present discriminatory arrangement. Instead, it should be taken to mean equal opportunity for access to all non-telco service providers (nonTPS's) who compete with telco provided services (TPS's).

Of course, the Commission could choose to prescribe all of the terms and conditions under which interconnection takes place. However, the danger underlying prescription is that the Commission does not possess the knowledge to make a prescription which would be economically efficient. A case in point is the allocation of access codes (a key element of interconnection

quality).³ How could the Commission know the proper allocation of these codes among users?⁴ As with most elements of interconnection quality, any attempt to identify the costs of providing access codes is futile since the costing of these goods is far too intertwined with the many facets of telephone company operations. It is doubtful that even a telephone company could make a reasonably accurate assessment of the costs of providing access codes. Hence, direct allocation by the Commission is likely to be inefficient since it would not have the requisite knowledge for making an efficient allocation.

Traditional oversight tools (such as cost supported tariffs and hearings) fail to give adequate protection when costs are uncertain. They also result in protracted proceedings. Under conditions where costs are uncertain, negotiations prove to be far superior to the traditional oversight tools.

³ Access Codes Defined: The telephone network uses a family of three digit access codes to provide information for call routing. One type of three digit access code is the area code ("NPA"). Area codes are used to identify a long distance call at the local exchange and to route that call through the intercity network to its final called area.

Exchange codes are another type of three digit access code. An exchange code ("NNX") is used to identify the exchange to which a call is to be routed within the destination called area. Other access codes are used to identify and route special services calls (e.g., 800 for WATS service and 900 for DIAL-IT).

In the future, fixed or variable length access codes are likely to be used to route calls through the network and to various telecommunications services suppliers including nonTPSSs. The overall pool of generic access codes will increase as the access codes are made freely interchangeable, thus eliminating the artificial difference that exists today for historical reasons. The use of access codes to route calls to other common carriers (OCCs) and to international record carrier (IRC) DATEL services has been discussed in ENFIA and DATEL negotiations, respectively.

A central aspect of access codes is that their quantity depends on telco decisions. Unlike natural resources, access codes are available only if the telco decides to make them available. For this reason, arbitrary allocation may reduce the number of codes available as well as result in an inefficient distribution.

⁴ See for example, Bruce M. Owen and Ronald Braeutigan, The Regulation Game: Strategic Use of the Administrative Process, Ballinger Publishing Company, Cambridge, Massachusetts (1978), p. 4.

Negotiated agreements allow marketplace forces to fill the void created by unknown costs. The fundamental rule proposed in this paper is: in the face of uncertainty the Commission should encourage negotiations; this would delegate most of the decision making power to the primary actors, namely providers and users of the telephone service. The primary actors have the best insight into the costs and benefits of a new service. Bargaining between the primary actors allows them to protect their own interests.

The strengths of the incentives to bargain depend upon the "starting points"⁵ for negotiations and the institutional arrangements to which the local telephone company is required to conform. The regulatory commission's role in the bargaining process should be limited to establishing the starting points and institutional arrangements so as to optimize the incentives to bargain. A starting point for negotiations is defined as the a priori property rights vested in the bargaining parties. Institutional arrangements are "market rules" that define how a telephone company must deal with others in relation to the way it deals with itself.

The Commission's role must also involve review of any negotiated agreements since neither negotiating party may have any strong incentives to protect third party interests. The Commission is left with the residual responsibility of protecting the public interest (including the interests of potential competitors).

The most difficult of the Commission's roles is setting a framework

⁵ What, in this paper, is referred to as a "starting point" is similar to the "Best Alternative To a Negotiated Agreement" (or BATNA) developed in Roger Fisher and William Ury Getting to Yes: Negotiating Agreement Without Giving In, Houghton Mifflin Company, Boston, (1981), p. 104, and as a "security level" or "minimax solution" in game theory. (See for example, R. Duncan Luce and Howard Raiffa, Games and Decisions: Introduction and Critical Survey, John Wiley & Sons, Inc., New York (1957).

within which successful bargaining will take place. Bargaining is successful where the outcome is will most likely be economically efficient. To best fulfil its role, the Commission must recognize and cultivate incentives to bargain.

This paper investigates those incentives to bargain. Specifically it addresses the incentives for the telephone company ("telco") to supply, and a non-telco service provider (nonTPS) to demand improved interconnection. Incentives to offer and buy access codes is used as a case study. By understanding where the incentives to bargain are weak and why, the Commission can go forward with policies that will strengthen, rather than defeat, incentives. The use of bargaining and the manipulation of incentives, as opposed to direct allocation, ensures that the allocation will be based on an economically ranked order of "need," rather than "need" as perceived by a regulatory commission.

To summarize, the Commission should set the general framework that provides the incentives. The adversary actors with the most at stake are then left to bargain their way toward a solution.⁶

⁶ For insight into the concensus of perceptions of the participants of observers in the ENFIA I negotiations which established interconnection prices paid by OCCs. see: Borchardt, The Exchange Network Facilities For Interstate Access (ENFIA) Interim Settlement Agreement, Report P-79-4, Program on Information Resources Policy, Harvard University, August 1979.

1.2 Summary of Recommended Strategy and Conclusion

The Communications Act of 1934 requires that "all charges, practices, classifications, and regulation for and in connection with such [common carrier] communications service, shall be just and reasonable" 47 USCA 201(b). Over the years, three basic methods for tariff justification have evolved:

- A. Carrier Initiated With Cost Support Data
- B. Negotiated Without Cost Support Data
- C. Carrier Initiated Without Cost Support Data

At present, "dominant carriers" (e.g., AT&T Long Lines) are required to provide cost support data when filing a tariff (Type A: "Carrier Initiated With Cost Support Data"). A rate investigation using carrier supplied cost support data is the traditional method for ensuring that a tariff is "just and reasonable." In practice, this method is both time consuming and difficult to administer effectively.⁷

As described, negotiated tariffs are a means of minimizing the role of the regulatory commission in tariff review (Type B: "Negotiated Without Cost Support Data"). This regulatory role is minimized by permitting the principal parties (the common carriers and their users) to agree on what services are to be offered and their price. When an agreement is reached, the terms of the negotiated tariff are submitted to the Commission for final approval. The Commission's review takes into consideration the nature of the parties and the terms and structure of the tariff. If (1) there is no reason to suspect

⁷ Hence the ongoing proceeding in Docket 79-245.

collusion between the parties, (2) resale is allowed without restriction, and (3) the tariff is not unlawfully discriminatory-in-fact, then the Commission should be satisfied that the tariff is "just and reasonable."

The negotiated tariff dispenses with the requirement that cost support data be filed. Instead, it relies upon the motivations of the negotiating parties. The negotiated tariff method is far more efficient, effective, and less arbitrary than either carrier initiated or commission prescribed tariffs. The negotiation method is most effective when the number of possible users and suppliers is relatively small so that all or most parties may effectively partake in negotiations.

A negotiated tariff is most meaningful when the potential users commit themselves to purchase some amount of the offering at the agreed upon price. If the telco can only get a "gentleman's agreement" from the negotiating users, the telco is less likely to come forward with any meaningful proposals for new services that require large startup investments. A binding commitment minimizes the telco risk, and thus allows it to make offers that require a larger commitment and to set rates that take the number of users into account.

Negotiated tariffs cannot completely supplant the use of other types of tariffs. Existing general tariff offerings at existing rates could be used as starting points (for example, local business service at existing local business rates). Alternatively, tariffs filed with economic cost support data may also be used as "starting points" for negotiations. A "starting point" provides a frame of reference for bargaining.

A good starting point has a number of essential characteristics:

- * it cannot be bargained away by either party
- * it may not exclude potential buyers
- * it may not prohibit resale of any service

The starting point should ensure potential buyers an option for interconnection regardless of the outcome of the negotiations. The outcome of successful negotiations will be variations on the offering defined by the starting point.⁸ The variation(s) may be an enhancement or simplification of the starting point defined by a cost supported tariff. One starting point may spawn numerous negotiated terms of interconnection.

In order to provide a fertile environment for successful negotiations, the Commission must have a basic and thorough understanding of the incentives that will drive the parties to bargain. Four factors can be identified that determine the strengths of the telco's incentives to bargain.

These factors are referred to as "dimensions":⁹

1. Degree of separation between the telco and its affiliate
2. Degree to which rate regulation is effective
3. Extent of subsidy
4. Quality of interconnection under consideration

⁸ A more technical analysis of bargaining is undertaken in Appendix A-2 to this paper.

⁹ The "factors" are discussed in detail in Section 2.2.

Other factors were found to be:

1. the extent to which discrimination is allowed
2. the threat of anti-trust proceedings

Finally, it was found that a Commission may control the incentives to bargaining through "market rules". Some of them are:

1. setting one or more "starting points" for bargaining
 - more than one starting point can be set where this will strengthen incentives to bargain.
2. controlling the industry structure
 - incentives to bargain are maximized by forcing the telco to offer its competing TPS offerings through a separate subsidiary or by refusing to allow a telco to offer the service at all.
3. controlling discrimination among telco users
 - a) limiting or opening up the negotiations to various users.
 - b) limiting or opening up the availability of the negotiated tariffs to various users
 - c) placing restrictions on the structure and terms of the negotiated tariffs.
 - the Commission may choose to exclude (or include) some parties from (in) the negotiations. This would affect the telco's incentives to offer new services. This is particularly true when the telco has stronger incentives to offer the service to some users than to others. If the telco is allowed to discriminate between favored users and disfavored users, then the telco may be more willing to go forward in the negotiation with the favored user group. Such discrimination would be illegal unless it were justified by some overriding public interest consideration (e.g., public health, safety, and convenience considerations).

2 The Telco's Incentives to
Negotiate for Improved Interconnection

As will be explained, the local telephone company is in a much stronger bargaining position than the non-telco service providers (non-TPSSs). This superior position is due to the telco's monopoly position with respect to local access. Compounding this problem is the rate-base regulation that attempts to constrain the monopoly position of the telco, but at the same time removes almost all incentives of the telco to meet the needs of non-TPSSs.

2.1 The Telco Is In Sole Control of Improved Interconnection

Presently, the telco is in sole control of access codes and other terms of improved interconnection. The telco's control over the terms of interconnection is a direct result of its monopoly in local distribution.

For example, the telco's control of access codes follows from the fact that the local switch has primary control over how a call is to be routed through the network. The digits dialed by a user are first encountered in the public switched network by the local switch. The local switch has the ability to interpret, delete, add, and convert the digits, including access codes, that the user dials. Thus, an operating company has sole control over how access codes are used by its customers and, therefore, over the allocation of those codes. Until now, some of these access codes have been reserved for area codes under agreement (or concurrence) between telephone operating companies throughout the United States, and AT&T Long Lines.¹⁰

¹⁰ Because of the benefits from being compatible with a nationwide numbering plan, local telcos have been content with the Bell allocation scheme. Nonetheless, the local telco's concurrence is, and always has been, essential to the Bell plan. As demand for access codes increases, this uniformity may

Absent strong incentives to direct its behavior, the telco's bottleneck monopoly control gives it broad discretion over the terms of interconnection offered to non-TPS providers. Better terms of interconnection will be offered only if the telcos have strong incentives to make them available. Commission decisions will have a profound impact on these incentives.

2.2 Rate Base Regulation and Sole Control Minimize Incentives To Sell

If the local telephone markets were not rate regulated and were open to competition, companies would sell access codes if they could earn more money by making the sale rather than holding codes for their internal use.

In fact, however, telcos are rate regulated and are in sole control of access codes. As a result of rate regulation, telephone operating companies may not be able to directly improve their profitability by selling scarce access codes to nonTPS providers. If rate base regulation is binding, a telco can only increase its profitability by increasing its rate base. In general, providing access codes would have an insignificant effect on the rate base of telcos. Thus, any additional revenues derived from the sale of access codes eventually would have to be matched by an equivalent amount of rate reduction elsewhere.¹¹

In order to develop an effective regulatory policy to encourage the most efficient allocation of access codes (and other aspects of interconnection quality), the incentives of the regulated telco to sell access codes must be

become more expensive to retain. Likewise, once the present divestiture plan of U.S. v AT&T is completed, local telephone companies may be less willing to allow AT&T to determine how their codes are used.

¹¹ However, there might be some regulatory lag; this could allow some short-run profits from sale of access codes for cash. Regulatory lag generally cannot be relied upon to overcome the incentives to keep access codes in the telephone system.

thoroughly understood. This section analyzes the strengths and weaknesses of incentives that might motivate monopoly telephone companies to sell access codes in a variety of regulatory and competitive environments. As it turns out, the strengths of these incentives depend heavily on the nature of the nonTPS service, on who is to use it, and on the nature of the competing TPS.

2.3 The Telco's Incentives to Sell Access Codes

Three major dimensions, or features, of the buyer/seller relationship must be analyzed to determine the ultimate strengths of the incentives or disincentives for telcos to sell access codes:

I: Structural Separations : This concerns the manner in which the telco provides its competing service. Four arrangements are considered in ascending order of structural separation.

- 1- Integrated TPS - Competing TPS is integrated into the telco's basic service offering.
- 2- Affiliated TPS - Competing TPS is provided by the telco through a rate regulated non-arms length affiliate with some common ownership of facilities.
- 3- Separate Subsidiary TPS - Competing TPS can only be provided by the telco through a separate subsidiary (i.e., complete operational, facility, and accounting separation from the rate regulated telco and its affiliates).
- 4- No TPS - Neither the telco, its affiliates, nor its separate subsidiary offers a competing TPS.

II: Rate Base Constraint on the Telco: Here two points are considered.

- 1- Regulation Binding - The telco (which is to sell the access codes) is operating at or near its maximum rate of return, or the prospects for adequate "rate relief" are good.

2- Regulation Non-Binding - The telco is operating far below its authorized rate of return and the prospect for adequate rate relief is poor, or the telco is not subject to rate of return regulation.

III: Subsidy Between Telco Services: Two points are considered:

1- Subsidy - The telco's affiliate or separate subsidiary that offers a competing TPS, must subsidize the local network.

2- No Subsidy - The telco's affiliate or separate subsidiary that offers a competing TPS need not pay a subsidy to the local network.

Each of these dimensions is discussed separately below.

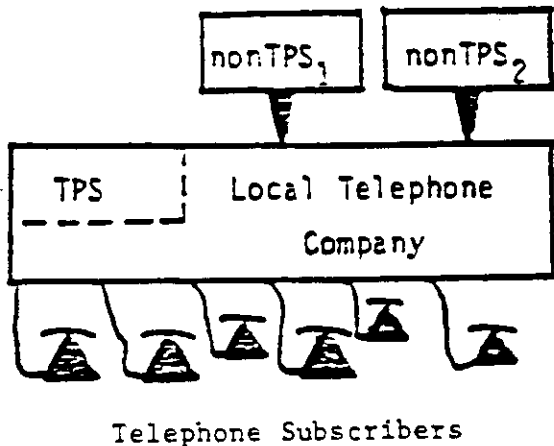
I: Structural Separations (see Figure I)

When the telco offers the TPS directly (i.e., integrated TPS), rather than through some affiliate, it will find selling access codes less attractive. When the TPS operation is integrated into the monopoly service of the telco, any charge to the TPS for access codes is only a book-keeping operation (i.e., "out of one pocket and into another"). Integration makes it easy for the telco to justify discrimination between its own TPS and a competing nonTPS by arguing that the nonTPS and TPS are not "like" services. The telco's argument typically continues by pointing out that the integrated TPS cannot be economically separated from the integrated monopoly telephone service, thus it should be treated differently from a nonTPS.¹²

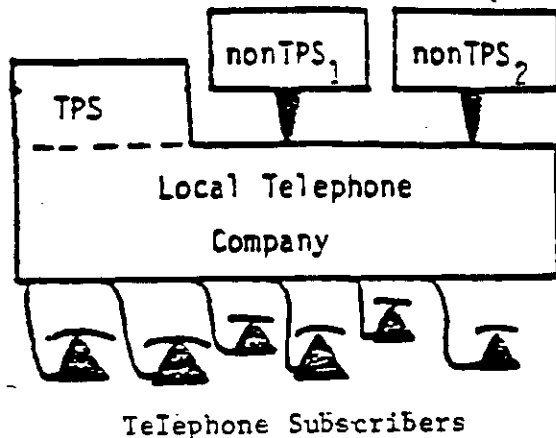
As a general rule, companies do not like to compete.¹³ This is

¹² "In the Matter of Petition for Waiver of Section 64.702 of the Commission's Rules and Regulations: Petition for Waiver of American Telephone and Telegraph Company", FCC Docket 80-628, March 20, 1981.

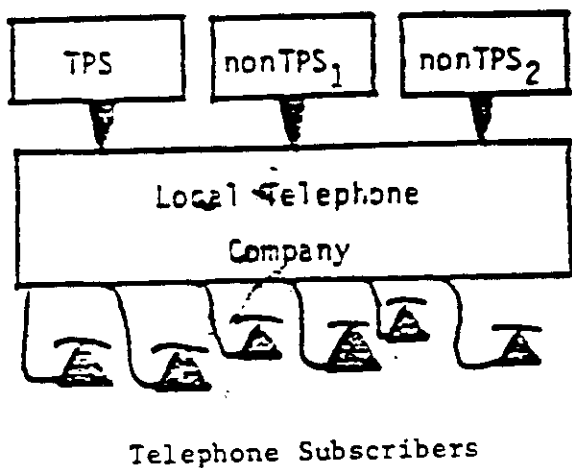
Case I: Integrated TPS



Case II: Affiliated TPS



Case III: Separated Subsidiary TPS



Case IV: No TPS

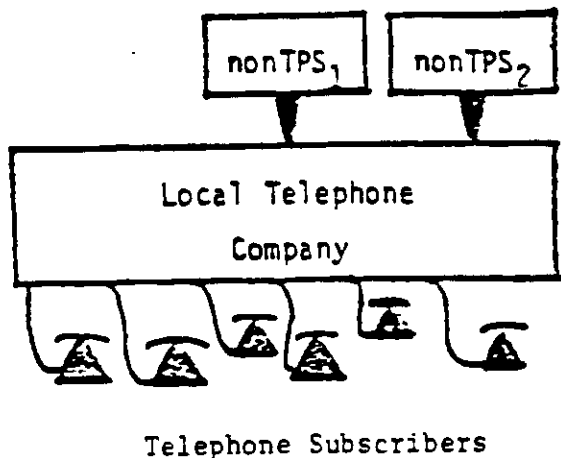


FIGURE I: STRUCTURAL SEPARATIONS ILLUSTRATED

particularly true for telcos which are restrained from making the maximum potential profits. Competition produces uncertainty. It undermines the telephone company's basic premise that its service can be efficiently offered only by a regulated monopoly supplier. By refusing to provide access codes to nonTPS providers, the telco can make the nonTPS appear less attractive than its own TPS. Particularly in a deregulatory environment, the telephone company stands to lose the right to offer competing services within its monopoly network because regulatory commissions are fearful of cross-subsidization between competitive and noncompetitive regulated telco services.¹⁴ Taking all these factors into account, the telco has strong reasons to discriminate between a nonTPS and an integrated TPS.

Where a TPS is offered through a rate regulated (and not totally separate) affiliate and the telco is prohibited from discriminating between the TPS and nonTPS, the incentives for a telco to provide access codes to a nonTPS are somewhat stronger than in the fully integrated case considered above. This follows from the fact that the greater degree of separation between the telco and its TPS affiliates makes blatant discrimination more obvious, thus making limited enforcement possible. However, less obvious forms of discrimination, such as those made possible through the use of shared facilities, advertising, personnel, overhead, etc., may go unnoticed. Such undetected cross-subsidies may continue to give the TPS an overall unfair economic advantage over competing nonTPSs. The end result may be that the nonTPS is offered "non-discriminatory" terms for interconnection quality at

¹³ As J.R. Hicks once put it: "The best of all monopoly profits is the quiet life", Hicks, Annual Survey of Economic Theory: The Theory of Monopoly, Econometrica 3 (January 1935):8

¹⁴ See FCC Computer Inquiry II Decision, Docket 20828, 77 FCC 2d 308. See also Cantor vs. Detroit Edison Co. 428 U.S. 579, (1976).

exorbitant rates that only the subsidized TPS can afford. The affiliated TPS can afford the higher price because it receives compensating subsidies from the telco services.

The incentive to sell access codes to a nonTPS is much stronger when the competing TPS can only be offered through a non-rate regulated fully separated subsidiary.¹⁵ With a separate subsidiary requirement, the competing TPS must be offered by the telco through a business entity that is separate from that which offers the telco's monopoly local distribution service. Along with such a structural requirement, the telco would be prohibited from discriminating between its TPS separate subsidiary and any competing nonTPSs. Thus, if the telco chooses not to provide access codes to the nonTPS, then its own TPS subsidiary will also be deprived of that feature.

The separate subsidiary approach creates strong incentives for the telco to bargain with the nonTPS. However, some situations may not make such a separation possible (see Section 4.4), or may impose "costs", (diseconomies of scale or scope) that outweigh its benefits.

The final category of structural separation arrangements is where there is no competing TPS. If no TPS competes with the nonTPS (e.g., hotel reservation service), the telco may not be concerned about the effect of nonTPS on its own services. It will be less likely to feel threatened by the nonTPS nor compelled to provide access codes to the nonTPS based upon equity grounds (as it would be if it offered a competing TPS through a separate subsidiary). The record shows that telcos have offered dialing arrangements to some services which do not compete with any of their services (e.g. "911" which is used for calling emergency services). One factor in this

¹⁵ Computer II established a separate subsidiary of this basic form for AT&T only, Ibid.

decision to offer access codes to these types of services is that it improves the public image of the telephone company. At the same time the limited offering does not have the detrimental effect of requiring the telco to offer access codes to all entities that request them. Public image is very important to any rate regulated entity that must deal with a public service commission.¹⁶ If the public image of the firm is not good, the firm is apt to run into resistance when it goes before its public utility commission to plead for rate relief. A telco will most likely "sell" access codes to some nonTPSs if it can discriminate between the preferred nonTPS's and the other nonTPS's.¹⁷

II: Rate Base Constraint

Rate base constraints will affect the incentives for selling access codes. As was pointed out earlier, the telco that operates at or near its allowed rate of return can increase its overall profitability only by increasing its rate base. Sale of access codes does not generally result in rate base increases; this means that access code sales will not directly increase profits where rate base regulation is binding. In such cases, "not-for-profit" motives will dominate.

Consider the case where a telco is operating far below its allowed rate of return and the prospects for rate relief are poor. In this situation, the

¹⁶ This follows naturally from the fact that regulatory commissions are political institutions since they are often composed of political appointees. Thus, the commissions must take public opinion into account when making their decisions. Also see: "The Image Customers Want to See," Telephony, p. 23, September 21, 1981.

¹⁷ For example, AT&T's position at the DATEL negotiations has been that unless AT&T can discriminate between DATEL providers and the class of general users, AT&T will be limited in the types of special dialing arrangements it can offer to DATEL.

telco will act more like an unconstrained profit maximizing firm (i.e., more like an unregulated firm). This telco may decide to use the sale of unused access codes as a means of boosting its revenues without having to make a large investment. It will have to think twice about whether it is better to "hog" these revenue producing commodities, or sell them and brighten its financial statement.

Thus the rule on rate base constraint is that if rate of return regulation is not binding, the incentives are to act more like a profit maximizing firm having unconstrained profits. That is, the firm will sell access codes if the revenues gained from this sale exceeds the cost of giving them up.

III: Subsidy Between Telco Services

If the competing TPS is forced to pay a subsidy to the local network (i.e., the charge for interconnection exceeds the real cost of interconnection), then the TPS is put at a price disadvantage relative to a nonTPS that is exempt from such a subsidy. If this price disadvantage is reflected in the charges for the TPS services, there will tend to be a migration of users to the cheaper nonTPS. This "deloading" of TPS facilities may lead to further increases in TPS service charges since the TPS must try to recover its fixed costs from a smaller number of users.

A loss in market share also creates an image problem for the TPS. Few corporate entities take much pride in losing market share unless they can earn increased rents in return. Firms that lose market share are often perceived as poorly managed and inefficient. It is bad enough when there might be some truth to this perception. It makes matters much worse when the high prices and loss of market share are substantially due to the subsidy that the TPS

must pay to the local network and that the nonTPS does not. An example of this situation, as AT&T sees it, is the current discrepancy between what Long Lines (presently AT&T Long Lines is affiliated with the Bell Local Operating Companies, thus it is currently a TPS affiliate) must pay for accessing the local network, and the amount the OCCs (competing nonTPS suppliers) must pay for a lesser quality access arrangement.

One solution to the subsidy problem is for the telco to get the nonTPSs to buy higher quality access at a higher price. Higher quality and cost for nonTPS interconnection will result in higher quality and price for nonTPS services. As a result, the nonTPS will shift its market position from being a high volume/low price/low quality competitor to being a lower volume/higher price/higher quality competitor. This might be possible the nonTPS maintains or improves its profitability. The bottom line is that the nonTPS provider is satisfied because he can maintain his profitability and can undertake a controlled growth pattern. At the same time, the telco is satisfied because its TPS is no longer losing significant market share.

If the costs of interconnection quality are below the value of this quality to consumers, both sides can gain.¹⁸

2.4 Other Influences on Incentives

If a telco believes that its status as a regulated carrier gives it antitrust immunity, it will feel free to pick and choose who it will interconnect with and under what terms. All of the incentives would be wiped out if such immunity were given.

Allowing subtle cross-subsidies will undermine incentives. If structural

¹⁸ See Appendix A-2 section on the "Dynamics of Bargaining".

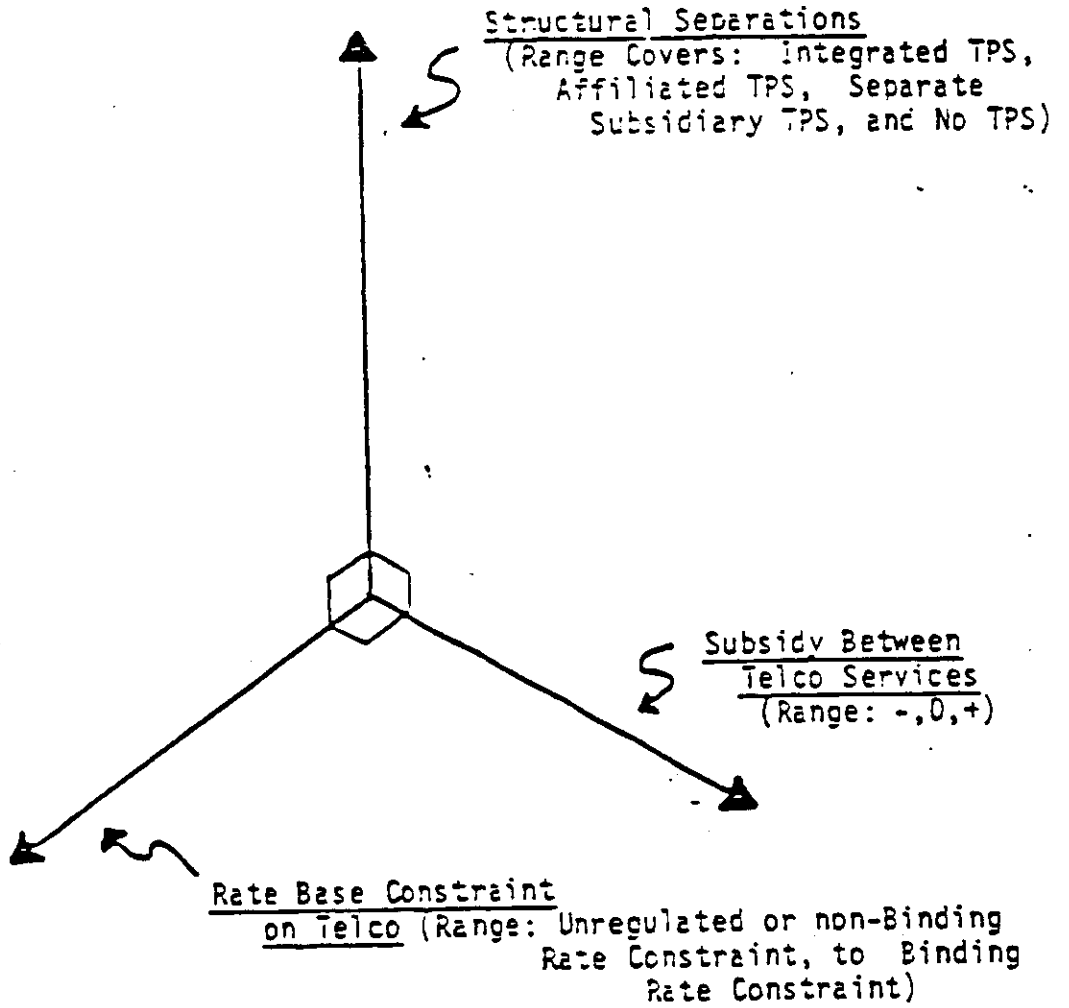


FIGURE II: THE THREE DIMENSIONS OF CIRCUMSTANCE
THAT DETERMINE INCENTIVES

separations are not well defined, subtle forms of information flows and cross-subsidies may continue. The result is discrimination-in-fact, defusing the incentives based on even-handed treatment of competing service providers.

2.5 Aspects of Interconnection Quality

The three major factors discussed above may also be used for assessing a telco's incentives to sell other aspects of interconnection quality to a nonTPS. Access codes represent only one point on the dimension of quality.

Other elements of interconnection quality are:

- 1- two or four wire trunk-side connections to a class 5 office
- 2- two or four wire trunk-side connections to a class 4 office
- 3- automatic number identification (ANI)
- 4- answer supervision
- 5- methods of signaling¹⁹
- 6- methods of transmission: voice-grade analog, wideband analog carrier, wideband digital carrier (e.g., T-carrier), fiber guide, micro-wave, etc.
- 7- miscellaneous: protection switching, overflow routing

It seems likely that the relative incentives associated with each of these points will be the same as those for access codes. On the other hand, the absolute strength of the incentives may vary significantly for each service. For instance, the telco may refuse to allow midair microwave interconnection to a nonTPS. Such an arrangement may result in large

¹⁹ For example, DC, SF, DX, MF, DTMF. see Engineering and Operations in the Bell System, Bell Telephone Laboratories, Inc., Indianapolis, Indiana, 1977.

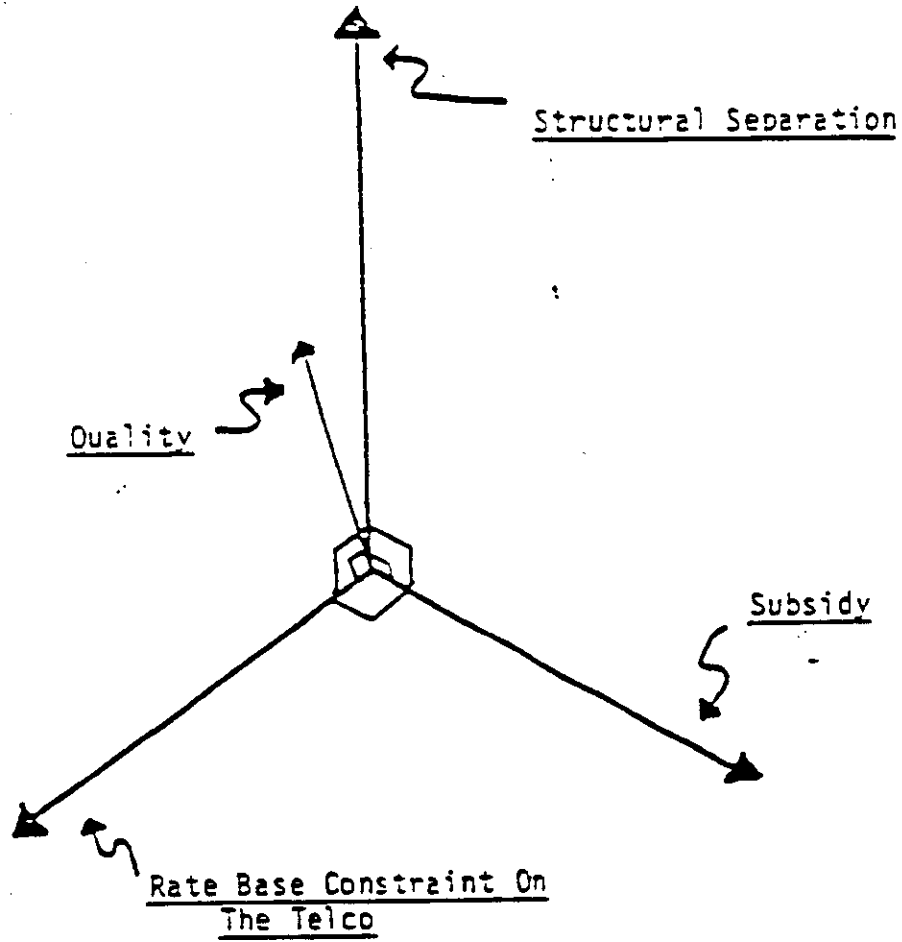


FIGURE III: THE THREE DIMENSIONS OF CIRCUMSTANCE, AND THE DIMENSION OF QUALITY

operational problems due to the high degree of interaction required between the personnel of the two independent firms. The unattractiveness of the situation would offset many incentives that might otherwise exist (a positive incentive might be that a TPS could interconnect in the same manner).

In the case of trunk-side connections, the relative incentives are closely coupled to those those for offering access code routing. This is due to the technical ties between codes and trunk-side connections on electromechanical switches such as the No.5 Cross-Bar. Specifically, the No.5 Cross-Bar switch was designed with the capability to route a number composed solely of a three digit access code to a trunk-side connection (e.g. 411, 611, and 911) without any modification to the number sequence dialed by the user. On the other hand, in order for a call to be routed to a line-side connection, the user must dial at least five digits (in the case of Centrex) or seven digits (in the case calls made on the local public telephone network) unless special arrangements are made to translate the three digit code into a four digit line number (four digits are required to uniquely identify a line termination on a local public switch that serves only one exchange code; if more than one exchange code is served, five or more digits is required).

3 Negotiated Tariffs Are Better
Than Cost-Supported Tariffs

Explicit cost justification of tariff filings ("cost supported tariffs") has been relied upon by the Commission to prevent monopolistic exploitation of consumers and to constrain unlawful discrimination among users. However, cost support data is not required by the Communications Act. The origins of the cost support requirement is found in Commission determined rules that apply in a limited number of situations. One situation where cost support data is not required involves non-dominant carriers. Non-dominant carriers have been allowed to file carrier initiated tariffs without cost support data ("carrier initiated tariffs without cost support").²⁰ Likewise, AT&T has been allowed to file the negotiated ENFIA I tariff without cost support data ("negotiated tariff without cost support").²¹ Non-cost supported tariffs can play a major role in the allocation of access codes and in determining how interconnection takes place.

3.1 Problems With Cost-Supported and Commission Prescribed Offerings

The major problem with cost-supported and Commission prescribed tariff offerings is that they slow down the regulatory process and, in the end, result in seemingly arbitrary regulatory determinations. For example, the Commission has no way of knowing how many access codes it should force the telco to offer to nonTPS suppliers, nor how to allocate these codes among

²⁰ "Competitive Carrier Rulemaking," Notice of Inquiry and Proposed Rulemaking, 77 FCC 2d 308 (1980) and First Report and Order, 85 FCC 2d 1 (1980).

²¹ See ENFIA tariff, CC Docket 78-72.

competitive users.

Given the trouble the Commission has had in determining costs in the past, how could the Commission determine the efficient number of access codes to be distributed?

Telcos have bona fide uses for access codes. Within the network, access codes may be used as either exchange, area, or special codes. If the Commission orders that some large number of codes be made available to non-telco users, it may end up taking access codes away from the telco even if the telco had a better use for them than the non-telco buyers who received them.

Even if the Commission were able to determine the "right" number of codes to make available to non-telco users, how could it ensure that they were equitably distributed? An auction might be one chosen scheme. Although an auction would make for an efficient allocation scheme given the number of codes to be distributed, who would get the proceeds of such an auction? There is no clear answer.

Rather than use auctions, the Commission is likely to force the telco to submit a cost-justified tariff. Here, demand may outstrip supply since the market clearing price may be higher than the "cost-based" price. Thus, an allocation problem may exist among possible users. This would lead to substantial telco discretion in the allocation of codes.

There is a more basic argument against having the Commission determine the number of codes to be released. Access codes are not a fixed stock of goods. The number of access codes available depends on technical decisions made by the telco²². Goods that are available in fixed supply may be distributed, redistributed, taxed, or confiscated without any change in the

²² See Appendix A-1.

amount available. Goods that can be produced are, by their nature, available in variable amounts that depend on market incentives. They cannot be handled arbitrarily without the risk that a suboptimal number will be made available.

Forced offerings may decrease the number of access codes produced. Specifically, suppose that the telco was aware that the Commission would force it to distribute some large share of its available access codes to non-telco users at a low price. Since many of these non-telco users would use their access codes for services that compete with TPSSs, the telco would gain less from generating new access codes than it would if it could determine the use to which they are put. Instead, the telco might choose either to refrain from producing any new access codes, to delay their production, or to distribute available access codes between exchange and area code use in such a way as to make the apparent number of available codes as small as possible.

3.2 Bargaining Is Better

Rather than simply taking access codes away from the telco and distributing them to non-telco users, the Commission should rely on non-cost supported, negotiated tariffs wherever possible. Incentives to sell should be encouraged rather than inhibited.

The best negotiated tariff is one upon which all prospective users have agreed and which provides for unlimited resale. Unlimited resale of all services makes it more difficult for the telco to cross-subsidize between substitutable services.

Given that the agreements do not involve antitrust violations or unlawful discrimination and that there is no collusive side-agreement, the agreement

should be welfare enhancing and consistent with the public interest.²³ By relying on negotiated tariffs, the Commission uses indirect incentives to encourage access code sales. The more the Commission reinforces incentives, the more receptive the telco will be to offering access codes.

Direct negotiations permit the primary parties to protect their own interests. This is the wisest approach since the users and telcos understand their needs better than the Commission does. The Commission is left with the role of protecting third party interests. This responsibility is lightened by the requirement that all offerings be subject to unlimited resale. In conclusion, negotiated tariffs minimize the Commission's role and allow the primary actors to determine their own goals and maximize their own overall welfare.

23 This assumes that carriers make agreements that are in their own self-interest and that, in general, carriers assessments of the state of the world are correct.

4 Recommendations for Commission Policy

4.1 General Rules for Encouraging Bargaining For Improved Interconnection

If the Commission decides to rely on bargaining rather than force the telco to give up some number of access codes, it must define the framework for the negotiations and at least one starting point. What should the Commission do to create and maintain incentives for sale of access codes for these new services? Based upon the analysis of the incentives to bargain, the Commission may enhance incentives by:

1. setting one or more starting points

2. controlling the telco's structure

e.g., requiring that the competitive TPS be offered through a separate subsidiary if it is to be offered at all.

3. controlling discrimination

- limiting or opening the negotiations to various users.
- limiting or opening the availability of the negotiated tariffs to various users
- placing restrictions on the structure and terms of the negotiated tariffs.

The separate subsidiary requirement is probably the most effective tool the Commission has for promoting access code sales to a nonTPS. A TPS subject to the separate subsidiary requirement can gain access codes only when access codes are also offered to potential competitors. Separate subsidiary

requirements, however, must be carefully drafted to prevent evasion. If they are not, the incentive to bargain may be undermined.²⁴

Where a subsidy requirement is involved, its effectiveness for encouraging the telco to sell access codes is related to the size of the subsidy (see Section 2.2, Part III). Some parties have proposed that the jurisdictional separations process be modified to eliminate the interstate-to-local exchange subsidy.²⁵ Elimination of the subsidy will reduce the incentives of the Bell system to make access codes and other terms of interconnection available to OCCs.

Without some overriding public interest to justify it, maintaining a subsidy is not an acceptable method to encourage bargaining. Subsidies are economically inefficient because they create misleading price signals in the marketplace. A meaningful separate subsidiary requirement is much more effective and economically efficient than maintaining or increasing subsidies as a method of stimulating access code sales.

4.2 Setting a Starting Point For Negotiations

Before bargaining can be used to allocate access codes, someone must have the legal right to offer these codes. The local telcos already have the

²⁴ This should not be taken to imply that the separate subsidiary requirement changes the basic motivation of the telco. The telco may still wish to monopolize the market that its TPS serves. What the separate subsidiary requirement does is to make it more difficult or even impossible to reach this goal. The separate subsidiary requirement makes it necessary for the telco to benefit competitive nonTPSSs in order to benefit its own TPS.

²⁵ See for example, Proposal of American Telephone and Telegraph Company and the Associated Bell System Companies for a Revision to the Jurisdictional Separations Process, CC Docket No. 80-286 (June 2, 1981). See also, Proposal of Wyoming Telephone Company, Inc.; UniTel of Nebraska; Nevada Telephone-Telegraph Company; Citizens Utilities Company; Telephone Utilities, Inc. for Exchange Plant Allocations in Jurisdictional Separations Procedures Using the Access Cost Factor, CC Docket No. 80-286, August 17, 1981.

equitable property right to define the use of access codes within their serving areas.²⁶ It would be most efficient for the local telco to be given clear legal title as well.

By vesting both legal and equitable title to access codes in the same party, transactions costs are minimized. As a result, the property rights are more freely alienable. The elimination of restraints on alienation is considered by U.S. courts to be in the public interest. "Private volition with respect to the transfer of property is an essential element in the way our society uses the market mechanism to effect the efficient allocation of resources."²⁷

In addition to acknowledging the telco's unique property right to access codes, the Commission can control other aspects of the "starting point" for negotiations. There should be a right to interconnection granted to the nonTPSSs. The costs for that "basic" form of interconnection should be reasonably ascertainable. Under no circumstances can the starting point interconnection right be bargained away. The starting point interconnection service shall remain as an alternative to the settlement. Thus, although desirable, it is not necessary that all parties agree to the settlement.

The Commission could use the basic quality and price of service offered by the telco to all business users as a starting point. If nonTPSSs have the right to connect at the purportedly subsidized business rate, telcos have strong incentives to entice the nonTPSSs to connect under better quality but higher price arrangements. [On the other hand, this rate may be so low that

²⁶ See Appendix A-1.

²⁷ Donahue, et. al., Cases on Property ACB, p. 667. This is also a major argument of Ronald Coase ("The Problem of Social Cost," Journal of Law and Economics Vol. 3, (1960) pp. 1-44).

the non-TPSs may have no incentive to purchase a cost-related alternative that the telco may offer in the negotiations.] Rather than choosing an existing local rate (such as the local business rate) as the starting point, the Commission could insist that the rate be based solely upon economic costs of the basic telephone service provided to the nonTPS. Such a cost determination would be made independently of the rates for other telco services (whether they be cost-based or not cost-based).

4.3 What If There Is No Agreement?

In general, once a starting point and a framework for bargaining are established, the Commission should wait for improved interconnection tariffs to be negotiated. If both of the parties can gain from an agreement the incentives to reach an agreement will be strong. An agreement will result in a Pareto improvement.

In some cases, the incentives to sell will not be strong enough to result in an agreement. This will be the case where no agreement (i.e., the starting point) is better than any agreement for at least one party. In these cases, the Commission will be faced with several important decisions. It will have to ask whether there is some pressing need for it to take stronger steps in order to encourage the offering. This might be the case if there is an overriding public interest in having some special group obtain some aspect of interconnection quality.

The Commission must weigh public interest concerns against the claimed needs of the telco. If the public interest is found to be overriding, the Commission has at least three basic options:

1. strengthen the incentives further
2. force an offering to the preferred group at some favorable rate, or
3. allow discrimination between preferred users and others

Although the Commission should establish a framework for bargaining that involves strong incentives to bargain, it should do so with the intention of abiding by the results. Adjusting incentives to reach a particular allocation of access codes may be very inefficient and may impose high costs on other users.

Forced offerings also suffer from inefficiencies; the same types of inefficiencies that negotiations were intended to avoid. Forced offerings should also be avoided unless the allocation decision is a highly informed one.

As a third alternative, the Commission could allow some discrimination. The telco may be willing to make an offering to a preferred group if it could discriminate against other groups. It may find a discriminatory offering more attractive than a general offering because of some detrimental effect of a general offering (e.g., having to choose between users when the demand exceeds the supply, improving the market position of some of its competitors, etc.). The negotiated agreement could discriminate in a number of ways, for instance it could sell improved interconnection arrangements under different terms to different competitive services. Alternatively, the agreement could

discriminate by placing restrictions on the use of the offering, or it could structure the offering so as to bundle the desirable interconnection elements with other elements of interconnections that are attractive (or useful) only to the preferred class of users. Regardless of the method of discrimination, the parties to the agreement would have the responsibility of demonstrating why such discrimination is in the public interest.

4.4 Possible Problems With the Separate Subsidiary: A Case In Point

As pointed out in section 2, control over the structure of the telephone company is the most effective and efficient method to establish an efficacious framework for bargaining. If the telco wishes to offer a competing TPS, it should be offered only through a fully separate subsidiary subject to the requirement of equal access for the competitors.

A separate subsidiary requirement may be impossible where the TPS is basic local telephone service (commonly referred to as "Plain Old Telephone Service" or POTS). Suppose, for example, that a local cable company wishes to offer an "intercom" system between its users and it wishes to include in its service an off-net connection to the local telco's POTS. The telco would have very little incentive to sell quality interconnection (including access codes) to the cable company.

A separate subsidiary requirement is not feasible in such a case since the telco's POTS is the telco's local distribution network which is to be accessed. The only regulatory tools left to be considered are: subsidies, Commission prescribed offerings, and Commission approved discrimination. Since there seems no exceptionally strong public interest to justify it, forced high quality offerings are to be avoided. Subsidies are generally

inefficient and particularly ineffective in this case where an integrated service is involved. This is true because under these circumstances the subsidy payment is only a book-keeping operation.

In this case, controlled discrimination against the cable company's POTS in favor of the other types of nonTPS services (i.e., nonTPS's nonPOTS) may be preferred because the telco may otherwise not offer access codes to anyone. It is assumed that a local telco finds it very objectionable to sell access codes to a cable company's POTS service. By allowing the telco to treat the cable company's POTS differently from other types of nonTPS services (e.g., OCCs and Custom Calling II), the incentives to sell to these other nonTPS services would not be "dragged down" by the disincentives associated with dealing with cable company's POTS.

The conclusion is that some form of discrimination between the cable company's POTS and other nonTPS's nonPOTS services may be necessary in order to preserve the incentives to sell to nonPOTS services.

Does this mean that the cable company's POTS will not be able to interconnect with the local telco and intercity carriers? No! It may still interconnect by subscribing to the basic arrangement offered by the "starting point" tariff (e.g., local business service at the local business rate). Furthermore, the cable company's POTS is free to work out interconnection arrangements with other nonTPS services (including OCCs and Customer Calling II type service providers).

Will the cable company's POTS ever be able to successfully negotiate for quality interconnection with the local telco's POTS network? This depends on the circumstances. As the number of users of the cable company's POTS grows, the telco will find it in its own interest to have quality interconnection between itself and the cable company's POTS. This follows from the fact that

the value of POTS to its users increases monotonically as the number of users connected to the POTS network increases. Thus, the current disincentives for bargaining with the cable company's POTS may be replaced by positive incentives to negotiate as the number of users of the cable company network grows.

5. Conclusion

As competition moves forward, the Commission must revamp the way in which it oversees the industry it regulates. Sole reliance upon outmoded tools such as cost supported tariffs and adjudicatory proceedings will stagnate innovation in the way firms interact and the offerings they provide.

This paper has presented a strong case for an increased reliance on bargained agreements during the transition. Bargained agreements reduce the demands on the Commission and, at the same time, assure that interests of the various parties are protected.

The Commission must still play a limited oversight role through:

- a) setting "starting points" for negotiations based on costs supported tariffs.
- b) review of negotiated agreements
- c) creating an environment which stimulates incentives to bargain. The most effective method for strengthening incentives was found to be requiring that TPS services be performed through a separate subsidiary.

APPENDIX

A-1 The Current Numbering Plan

A universal numbering plan establishes a correspondence between individual telephone stations and their identifying numbers. Any plan is a compromise between the number of digits that must be dialed when a user makes a telephone call and the maximum number of telephones that can be dialed. Under the current numbering plan, a user must dial at least ten digits to make a long distance telephone call.²⁸ The theoretical limit of the number of telephones each user can reach with a ten digit numbering plan is on the order of ten billion (i.e., 10^{10}). This limit is not realizable due to limitations in the existing network and its configuration, and due to the allocation of codes between area and exchange uses and the allocation of area codes across states.

²⁸ Under the current numbering plan local and long distance numbers are of the forms: ("NNX")-XXXX and ("NPA")-("NNX")-XXXX, respectively. Where dial one first has been implemented, the customer must dial a "1" before dialing the "NPA." Customers of OCCs must typically dial twenty-one digits including the called parties number, ("NPA")-("NNX")-XXXX.

TABLE I: CURRENT ALLOCATION OF THREE DIGIT ACCESS CODES

<u>Long Distance Area Codes ("NPA")</u>	<u>Local Exchange Codes ("NNX")</u>	<u>Special Services, International, Plus Reserve Codes</u>
N-0-X N-1-X except N-1-1	N-N-X	0-X-X 1-X-X N-1-1 N-N-0 unallocated
<u>Number of Combinations Under Strict Allocation:</u>		
152 (=8x2x10 - 8)	576 (=8x8x9)	208 (+ 64 of NNO reserve)
<u>Approximate Number Actually In Use:</u>		
131	less than 640 depending upon the exchange	at least 208 depending upon the exchange

[Note: "N" = 2-9; "0" = 0; "1" = 1; and "X" = 1-9; NPA is an abbreviation for "Numbering Plan Area"; the reason that the "Number of Combinations Under Strict Allocation" is sometimes less than the "Approximate Number Actually In Use" is that some special service codes and reserved codes have been reallocated as exchange codes in some exchanges]

The Distinguishing Feature: The First Three Digits

A local telephone switch (i.e., a class 5 switch) must be able to distinguish between a long distance call, a local call, and special codes (e.g., 911, 611, operator routing codes, etc.). Historically U.S. local telephone switches have distinguished between these three groups based upon the first three digits dialed. The allocation of the three digit codes is shown in Table I.

Exchange Codes Are Scarce

In some calling areas, the supply of access codes allocated as exchange codes is almost exhausted. To provide short-term relief, many three digit

codes (which were special codes (e.g., 611) and others which were reserved for future use (e.g., N-N-O)) are being reallocated to the exchange code category.²⁹

One solution to exchange code exhaustion is to split the calling region in two, assigning an area code to each. This effectively doubles the total number of exchange codes in the old calling area by allowing exchange codes to be reused in each newly created calling area. Although each area code split effectively doubles the number of usable exchange codes within the affected calling area, it also uses up one previously unused area code. Thus, relief of exchange code scarcity in this manner reduces the supply of area codes and vice versa.

As of 1979, only 21 three-digit codes currently allocated to the area code category remain unused.³⁰ When this supply is exhausted, some access codes presently allocated as reserves (e.g., N-N-O) will have to be reallocated to be used as area codes. Future exchange and area code exhaustion is one reason why telcos are reluctant to allocate presently unused three-digit codes for access to non-telco provided services.³¹

Relief: Dial-One-First

The implementation of a "dial-one-first" plan will substantially reduce the three digit code scarcity. Dial-one-first means that whenever a caller wishes to place a long distance telephone call, the first number dialed will

²⁹ Notes On The Network, Section 2-4, AT&T, 1980.

³⁰ It is projected that this supply of area codes should be used up sometime after the year 1995. Notes on the Network, Section 2-2.03, AT&T, 1980.

³¹ AT&T Response to OCC ENFIA III Inquiries pp. 155-156, June 1, 1981.

be "1," followed by the remaining ten digits.³² Three digit access code will no longer uniquely distinguish long distance calls from local calls. The net result is that almost any three digit combination will be usable as both an area/access code and an exchange/access code. This increases the theoretical limit of allocated and unallocated three-digit access codes (area codes plus exchange codes plus codes used for other purposes) from approximately 800 to 1,800.³³

Most exchanges in the country either require dial-one-first for toll calls or have a dial-one option (i.e., the switching machines are dial-one-first compatible). This is true of both Bell Operating Companies and the Independent Telephone Companies.³⁴

³² Under the dial-one-first plan, local and long distance numbers are of the forms: NNX-XXXX and 1-NPA-NNX-XXXX, respectively.

³³ Without dial-one-first, the access code pool included only N-X-X combinations, amounting to 800. With dial-one-first the total pool is expanded to include 1-X-X-X, increasing the number of combinations by 1000. The net result is that a total of 1800 access codes are available in an exchange under dial-one-first.

³⁴ In areas serviced by the Bell Operating Companies, 85% require a "1+" prefix on toll calls while 97% are "1+" compatible. The remainder are not equipped to or are not capable of accepting "1+." A switch that is capable of accepting "1+" can be modified to require "1+" at relatively low cost. The reverse, however, is not always true. Information sources for BOC and independent telcos are AT&T and USITA, respectively.

A-2. The Dynamics of Bargaining for Quality

Introduction

Bargaining is possible only when the bargaining parties start in a position where each has something to gain from an agreement.³⁵ The distribution of the gains received by each side will be determined by the terms of the agreement.

A starting point is an essential prerequisite of bargaining. The characteristics of a starting point are critical to the outcome of the negotiation. A starting point determines the position of the parties relative to what they may gain from agreement. If the starting point is ambiguous, it is impossible to be certain that one is better off after an agreement than one would be under a Commission allocation.

This appendix deals with the issue of bargaining between nonTPSS (who wish to gain quality interconnection) and telcos. The starting points discussed are generally low-side starting points, (i.e., low quality/low price. Thus, for example, one low-side starting point is to make local business interconnection available to all at local business rates. The analysis of this appendix would not differ substantially if a high-side starting point (i.e., high quality/high price; for example, interconnection arrangements equal to those presently given AT&T Long Lines at the charge that Long Lines must pay through Separations and Settlements) were determined.³⁶

³⁵ That is, bargaining is possible only in a cooperative non-zero sum game. (See R. Duncan Luce and Howard Raiffa Games and Decisions: Introduction and Critical Survey, John Wiley & Sons, Inc., New York (1957)).

³⁶ This seems to be the approach taken in the antitrust settlement. One problem with the settlement agreement is that it does not appear to allow for

If negotiations were to begin at a high-side starting point, then many nonTPSSs would merely bargain for lower levels-of quality at discount prices.

Access codes are only one of a range of quality options that the nonTPS may value. Bargaining over access codes is likely to be only part of a more general negotiation over interconnection quality. This appendix develops a graphical analysis of the function of bargaining. It is assumed that the telephone company and the nonTPSSs bargain over "quality" and a price for access.

Non-Telco Provider's Iso-Profit Curves

Figure A-1 represents a set of "iso-profit" or "indifference curves"³⁷ for a hypothetical nonTPS and for different starting points, based on an assumed industry structure. The industry structure determines the shape of the indifference curves.³⁸ As drawn in figure A-1, the carrier is best off on non-cost based negotiated divergence from the starting point.

³⁷ Indifference curves show the locus of points between which the carrier is indifferent. As we assume that the nonTPS is a profit maximizing competitor, this curve will be the locus of points at which the firm earns a given profit level. Thus, for example, the firm may be indifferent between (i.e., equally well off at) a high price-high quality option and a low price-low quality option; if so, these points are on the same indifference curve. See any intermediate micro-economics text for an extensive discussion of indifference curves. For example, see George J. Stigler, The Theory of Price, Third Edition, The Macmillian Company, New York, 1966, pp. 48-68. The indifference curves presented here differ in appearance from those presented in texts as they show the tradeoff between increases in quality (a good) and increases in price (a bad). Standard indifference curves show tradeoffs between two goods.

³⁸ For example, under the current framework a non-TPS (which competes directly with the TPS) indifference curve might be distorted as the quality level approached the quality level given to an integrated or affiliated competing TPS. The distortion is created because the non-TPS must compete with the TPS in the same retail market. Up to the quality level where their quality of interconnection is equal, the non-TPSSs must operate under a retail pricing constraint where their retail price never exceeds that of TPS. This follows from the simple fact that the non-TPS cannot charge a higher amount than the TPS for a lesser quality service.

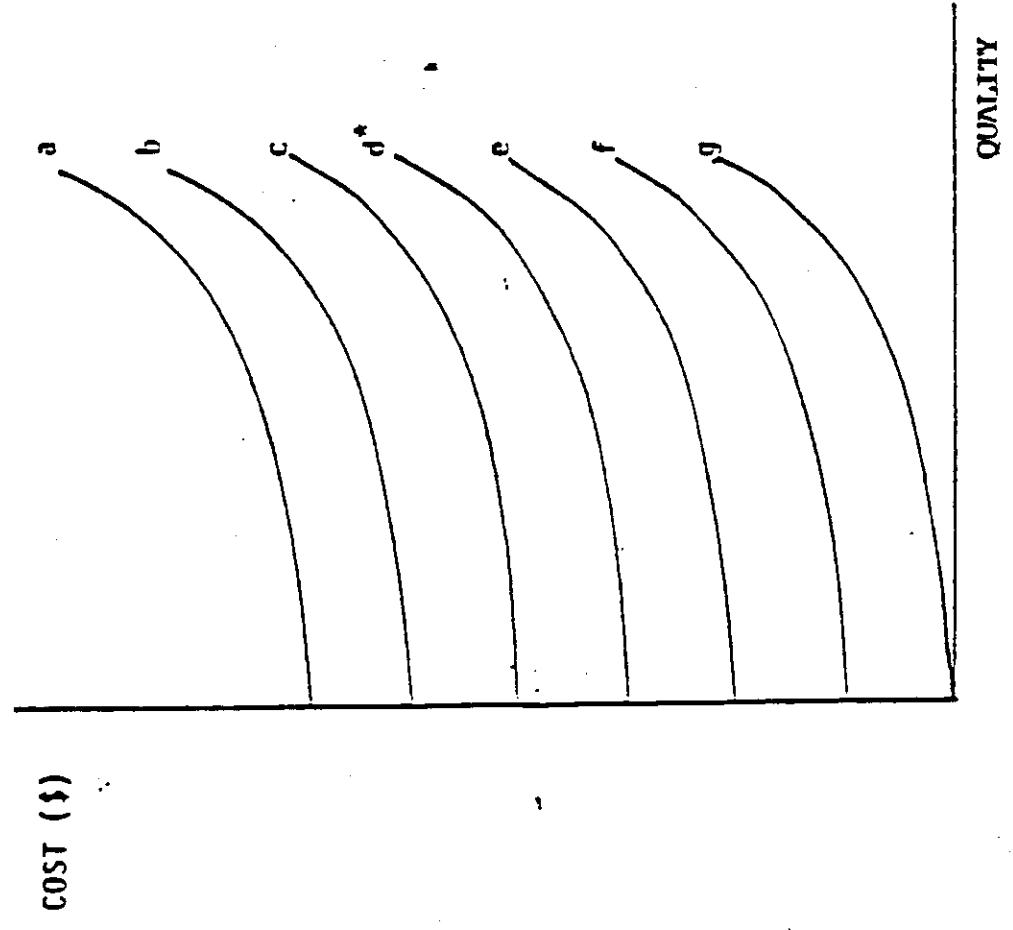


FIGURE A-2: Telco Iso-Profit Curves
[*: intersects curve j at "cost" axis]

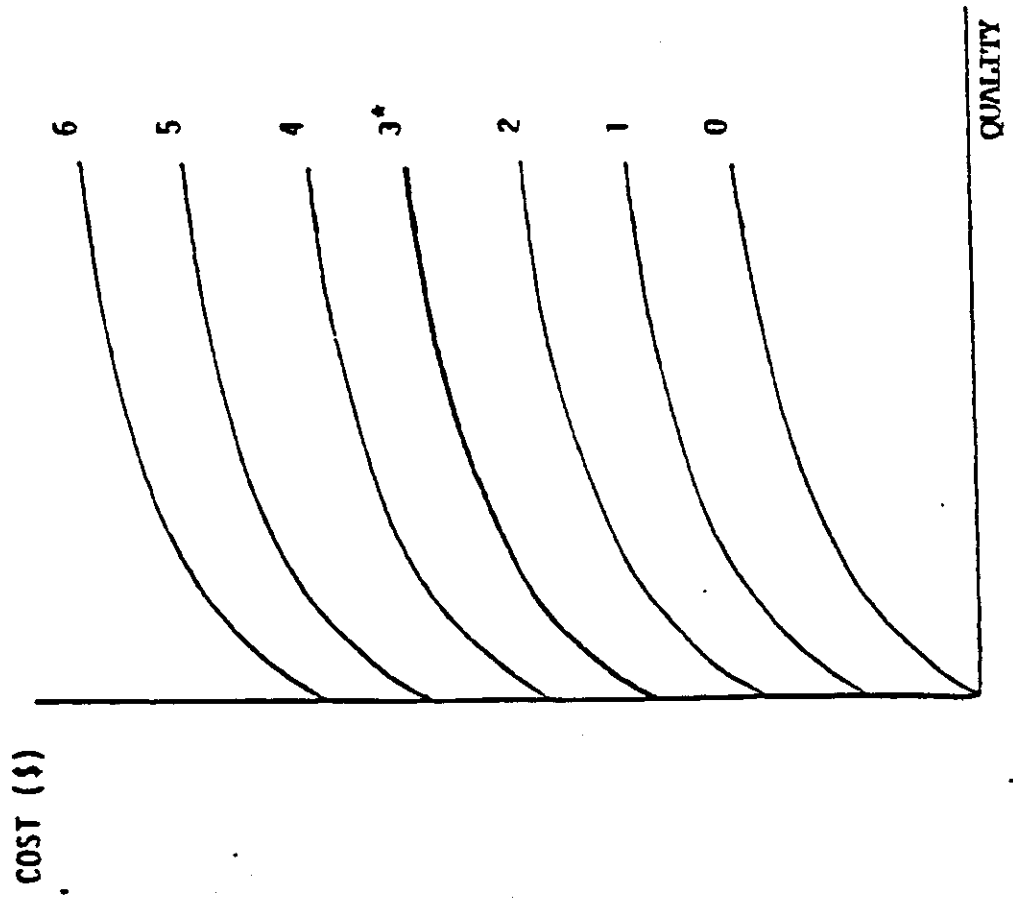


FIGURE A-1: NonTPS Iso-Profit Curves
[*: minimum profit curve]

indifference curve "0" (with a low price for any given level of quality), and worst off on indifference curve "6." Naturally the nonTPS may not have to accept all indifference curves; it can leave the market if it would otherwise suffer losses. Throughout this appendix, it is assumed that the nonTPS will remain in business if it can achieve at least indifference curve "3," but will leave the market if it cannot.

Figure A-1 demonstrates the importance of the Commission's determination of the basic starting point. The applicable nonTPS iso-profit curve is the one which intersects the price axis at the Commission determined low-side starting point. The lower the initial price the more advantageous will be the position of the nonTPS. It need not accept an indifference level inferior to this initial level and will move only if the telco can offer it something that betters its lot. Too high a starting point for access bargaining will mean more of the revenues of the nonTPS will go toward increased costs of access. This will ensure that the nonTPS remains small, or may drive it from the market entirely. Too low a starting point may result in telco basic service subsidizing nonTPS and separate TPS services. The low price will permit the nonTPS to buy more than is economically efficient and will result in an overexpansion of these services. It may also result in telco losses.

Telco Iso-Profit Curves

Telco iso-profit curves (Figure A-2) depend upon a number of institutional factors. The most straightforward case is where the telco does not provide a competitive service. In this case, the telco's iso-profit curve is identical to a curve reflecting its marginal cost of increasing quality. As with the nonTPS isoprofit curves, the applicable TPS cost curve will be the one that intersects the price axis at the starting point defined by the

Commission. Thus the starting point is a scaling factor for a single marginal cost of quality curve.

In the case where the telco may provide a competitive service only through a separate subsidiary, the telco iso-profit curve is identical to those in the case where the telco offers no competing service. Separate subsidiaries avoid the distortion caused by non-equal treatment of TPSs and nonTPSs. The requirement that separate subsidiaries be treated identically to non-telco service providers means that the telco would have to subsidize or be subsidized by both TPS and nonTPSs. If entry is easy and the subsidy is in the direction of the TPS and nonTPSs, the profits earned by this subsidy will encourage entry and drive the price to the break-even level in spite of the subsidy, assuming that the market is potentially competitive. If the telco subsidiary had a fairly small market share, the bulk of the subsidy would go to nonTPSs rather than to the subsidiary--an unattractive option. Even if regulation of cross-subsidy were ineffective, cross-subsidy of the subsidiary through favorable access pricing would be desirable only if the subsidiary had a substantial market share and if there were barriers to entry.

The telco iso-profit (bargaining) curve converges with the telco cost curve when either the telco does not provide the service (no TPS) or where the telco can only provide such services through a separate subsidiary. This convergence provides a strong efficiency argument in favor a separate subsidiary (or divestiture where vertical economies are small). It also has the desirable effect of encouraging bargaining. Such a convergence of the bargaining curve with the cost curve will not occur under different institutional arrangements.

In the text it was argued that a telco may have incentives to offer access quality to non-telco service providers if the telco affiliate were

forced to pay a subsidy to basic telco services, and if the non-telco service providers received lower quality interconnection but were not forced to pay such a subsidy. This argument may seem counterintuitive. At first blush, one might conclude that improving competitors' access quality would either cost competitors more than it was worth to them (and hence be rejected by the competitors) or draw more customers away from the telco affiliate than could be compensated for in a higher access price. The quality of interconnection to be offered is not a zero sum game, however. Both the telco and the competitors may be able to benefit without damaging the telco affiliate.

Assume that the telco can charge so much for the access quality offered that the non-telco service provider is only slightly better off in accepting the quality. Such a non-telco service provider would have to raise its prices, this would reduce its attractiveness to some of its consumers while at the same time its improved quality will attract other customers who demand better quality services. Thus, depending upon the needs of the marketplace, there may be a net gain or loss in the number of nonTPS customers.

Consider the existing situation where different customers demand various types of service while the telco affiliate specializes in providing only some of these. The telco may use a strategy of offering specific forms of interconnection quality which will allow the nonTPS to supply those markets that the telco TPS does not wish to serve. The telco's objective is to induce the non-telco service providers to service those specialized markets. If the telco's plan succeeds, the telco can benefit from profitable access quality sales while the non-telco service providers might be able to profit by the new markets that are opened to them.

In this case, the telco bargaining curve is different than the bargaining curve which applies when either no TPS exists or the TPS is offered through a

separate subsidiary. The telco restricts its offers to certain quality points and bargains only in the region around these limiting points (i.e., the curves are discontinuous). In any case, the telco cost curve establishes a lower bound for the points offered (since the telco will not accept a loss on offering access quality even to non-competitors).

The reason why the subsidy requirement is relevant is that profits generated in the sale of access quality may be used to offset the subsidy that the telco affiliate must otherwise pay. It is not necessarily the case that rate regulation will result in loss of these profits with no compensation. Rather, the subsidy required of the affiliate may be reduced with an attendant increase in the competitiveness of the affiliate. The telco may choose to leave several markets open to non-telco service providers in order to generate revenue to lower the affiliate subsidy and to be more competitive with those non-telco service providers that continue to offer directly competitive, but cheaper and lower quality, service.

Figure A-2 shows hypothetical cost curves for the telco. Curves that are higher on the price axis produce more revenue for the telco. Curves that are lower produce less. From the standpoint of revenue, "a" is the "best" cost curve while "g" is the worst.

The Bargaining Process

The second section of this appendix discusses strategic behavior and bargaining power.

Suppose that the Commission determines that the price of basic access is to be set at "A_d" in figure A-3. Then, point "A_d" will determine the starting point for the negotiations. The quality of access purchased will be between basic ("Q") and "Q'", and the price per call paid will be between "A_d" and

"B."

The two curves originating at A_d ("3" and "d") may be termed the bargaining curves for the nonTPS and the telco, respectively. Neither the telco nor the nonTPS will accept a lower profit (higher loss) than it would get at point A_d . By moving into the shaded area however, both the telco and the nonTPS can be made better off than at the starting point or on the boundary of the negotiations curves.³⁹ The point in the shaded region that is selected depends on the relative bargaining positions of the parties and on the incentives that they face.

If the Commission were to err in setting a non-compensatory initial price for basic access, the telco might be able to cover its costs by offering a higher level of quality at a higher price. The telco can bargain for a point like "D" that generates more profit than the starting point A_d (figure A-3). Point "D" leaves the nonTPS no better off than at the starting point A_d . Likewise, point E (on the telco's starting cost curve) gives all of the benefits of bargaining to the nonTPS. At point "F," both sides are better off than at A_d .

In figures A-4 and A-5, the Commission is assumed to have selected less auspicious starting points. In figure A-4 the Commission sets point A_a as the starting point. The telco is willing to accept no less than cost curve "a," but the nonTPS can do better by leaving the market since it will operate at a loss anywhere above indifference level "3".⁴⁰ Since there is no interception between "a" and "3", no bargain will leave both better off.

³⁹ As was noted above, however, where the telco offers a service itself, rather than through a separate subsidiary, actual telco bargaining curves differ from the cost curves.

⁴⁰ Indifference level 3 has been used to indicate the break-even curve for the nonTPS.

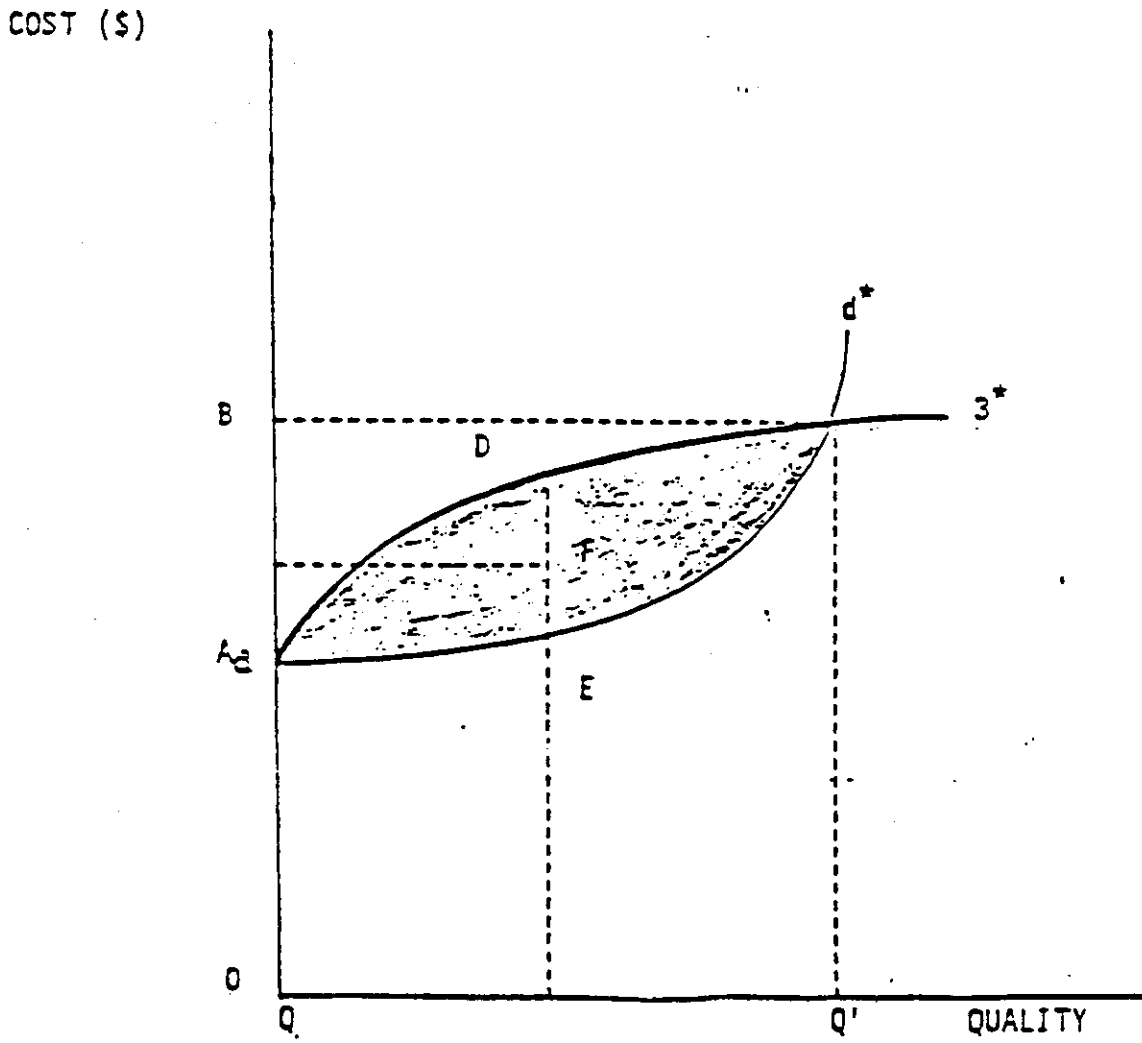


FIGURE A-3: Illustrations of Telco- and NonTPS Iso-Profit Curves That Originate at the Same Starting Point (A_0)

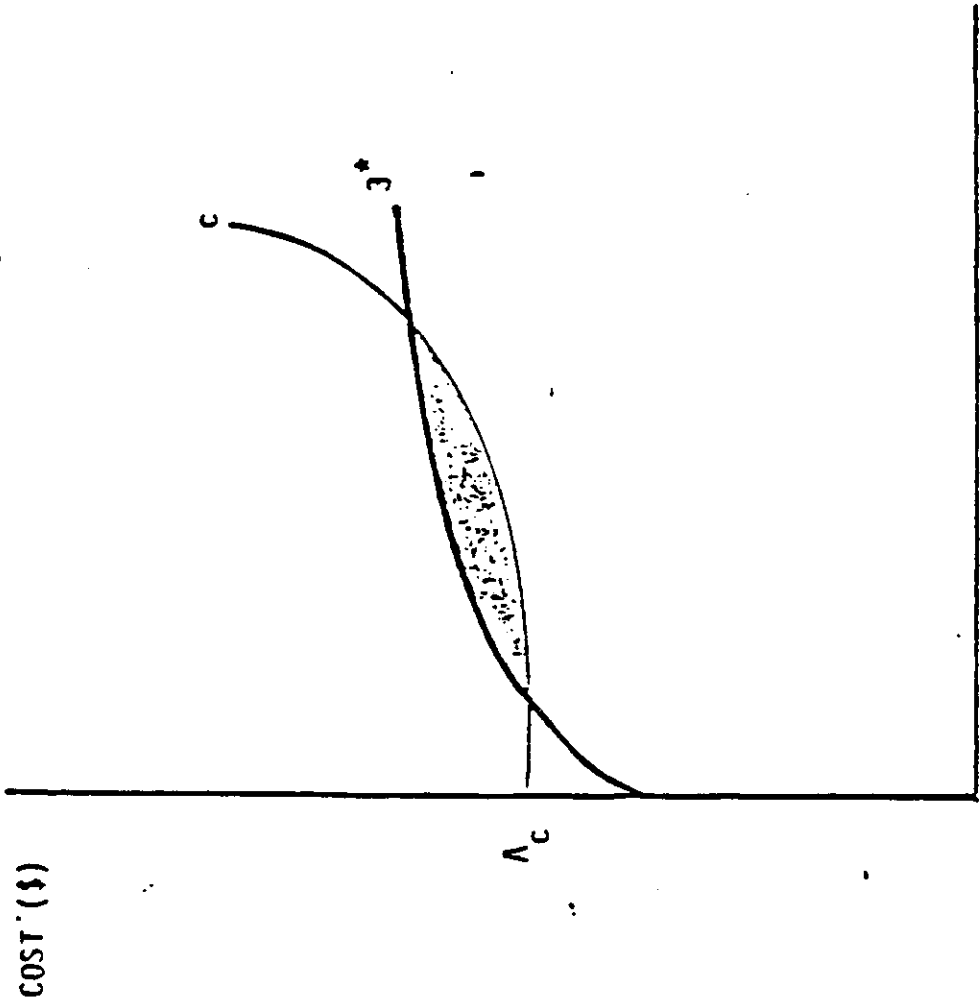
Figure A-5 is similar to figure A-4 in that the starting point "A_C" does not allow nonTPS survival. Unlike figure A-4 there does exist a bargaining range that could leave both the telco and the nonTPS better off in strictly monetary terms. In a competitive environment, a bargain would be struck and the nonTPS would enter at some high price/quality level. However, for services that compete with telco or telco affiliate services (other than fully separated subsidiaries), a rate regulated telco could prefer that no entry take place at all. By refusing to move from the Commission determined point "A_C", it could eliminate potential competition.

The analysis demonstrates the importance of the starting point set by the Commission. Too low a starting point will result in subsidization of the nonTPS (and any competing TPS). Too high a starting point could result in elimination of the nonTPSs even where they should survive. Even if nonTPSs do survive, too high a starting point could limit their expansion and reduce the price competition that they could otherwise generate.

Strategic Behavior

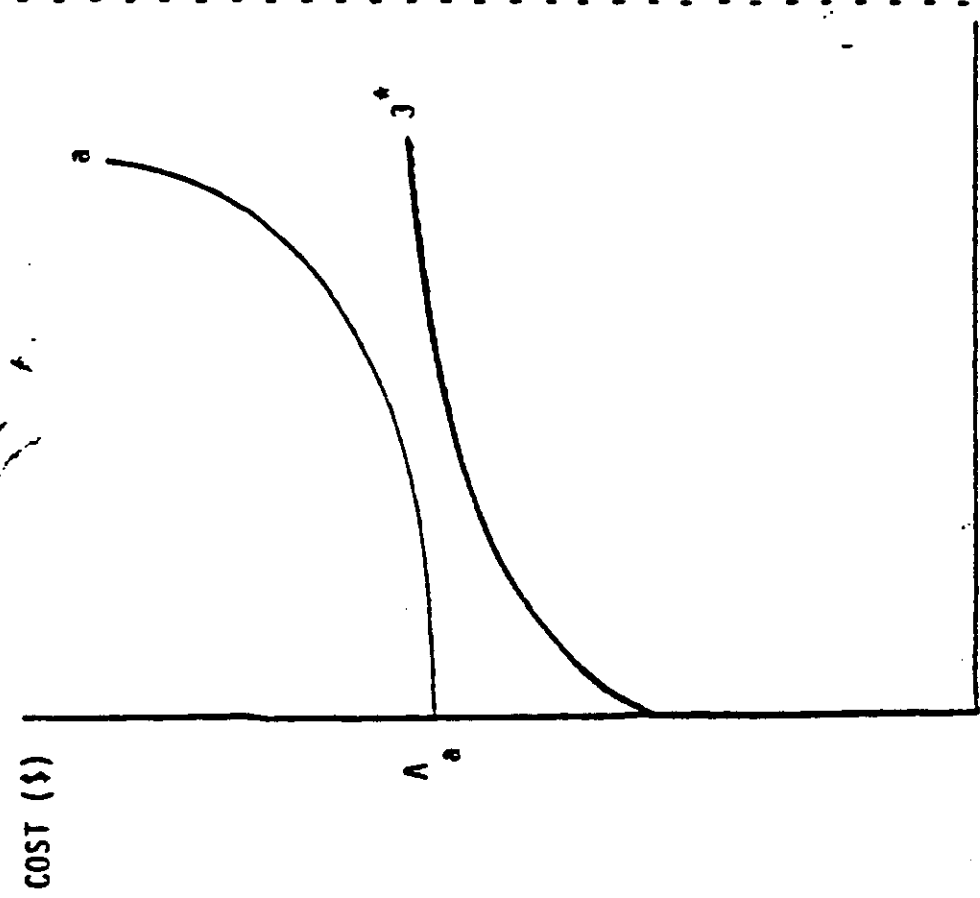
If there were large numbers of telcos and nonTPSs in every area, no carrier would be able to misrepresent its tastes and an efficient outcome, with marginal benefits equal to marginal costs and with some sharing of the benefits from bargaining, would result. (The result would be in the interior of the shaded area.) In fact, however, in any calling area there is only one telco though there may be several nonTPSs. The telco, therefore, is likely to have a bargaining advantage and will be able to force the nonTPS to yield most of the benefits of moving to a higher quality level.

In practice, neither nonTPSs nor telcos know exactly what profit levels are associated with any given combination of price and quality offered the



QUALITY

FIGURE A-5: Iso-Profit Curves Where Starting Point (λ_c) Results in Restricted Region for Bargaining



QUALITY

FIGURE A-4: Iso-Profit Curves Where Starting Point (λ_a) Is Too High

nonTPS. Both bargain on the basis of their expectations. This uncertainty may make bargaining more or less difficult than would be the case if both parties had full knowledge. In general, however, it will make both sides more cautious, and will tend to restrict the level of quality purchased.

If the telco assumes that nonTPS profits and market share are more sensitive to quality than the nonTPS assumes, it will demand a higher price for quality than the nonTPS is willing to accept. The result is that too little quality will be purchased, regardless of which carrier is correct.

Likewise, if the telco believes that nonTPS's demand is less sensitive to quality than the nonTPSs believe, an agreement on a relatively high quality level at a relatively low price may be reached. The agreement will tend to benefit the party that has the most accurate knowledge of true consumer preference.

In the real world, uncertainty exists and will affect bargained solutions. Where losses to one party or the other are likely to result from uncertainty, two things occur: first, the parties to the agreement behave cautiously. They reach agreements only when they are relatively certain about their assumptions. Second, both parties have a strong incentive to find out what the actual tastes of the consumer are. The consumer will tend to be benefited by this research since the final output is likely to be closer to his desired level.

Because of uncertainty about consumer demand levels, and because it may be cheaper to provide a given level of quality in the future than it is now, negotiators are likely to make agreements quite flexible or specify periodic renegotiations of terms to meet these changing circumstances. Periodic renegotiations will avoid having either party stuck with a "sucker deal" for

any extended period of time.⁴¹ That distortions may be introduced by uncertainty need not imply that bargaining can benefit those who have superior knowledge only at the expense of the other party. Mutually beneficial agreements can be reached, and the Commission can put a limit on any monopoly abuse by setting a reasonable starting point.

⁴¹ This is not to say that the Commission must force carriers to agree to short-run contracts only. There are certain economies that can only be realized through long-run commitments. This argument indicates, however, that short-run agreements are likely to be the norm, and that the Commission should not force carriers into long run commitments. Following the rules established in the paper, these agreements cannot modify the starting point for newly entering nonTPSs. A nonTPS can bind only itself in an agreement. Starting points can be modified only by the Commission.

GLOSSARY

- Access Codes. one of a series of codes, generally thought of as containing three digits, used by the telephone network to route calls.

- AT&T Long Lines. an AT&T Division that provides the bulk of domestic interstate toll services

- Carrier. a firm that provides telecommunications for hire

- Commission. Federal Communications Commission

- Cost Support Data. data filed by regulated carriers in support of filed tariffs. Such data is used to demonstrate that rates filed reflect costs

- Discrimination. the ability of a carrier to offer similar services to different customers under different terms where there are no cost differences, or under the same terms where costs differ

- Electromechanical Switching Systems. circuit switching system that sets up a transmission path using electromechanical devices such as relays, e.g. No. 5 Crossbar Switch;

- Exchange Area. the territory within which telephone service is provided without toll charges and covered by a specific rate basis, usually consisting of a single city and environs

- Fully Separate Subsidiary. a subsidiary that is required to maintain separate books, facilities, and personnel, and may only deal with its parent company on terms that are available to non-affiliated companies that compete with it (ie, nonTPSS)

- Interconnection. the means by which nonTPSSs connect to the regulated telephone companies network

- Local Loop Bottleneck. local distribution component of the telephone network which many companies must use to gain access to most telephone subscribers

- Negotiated Tariff. a tariff filed as a result of an agreement between a telco and one or more of its customers. Such a tariff may or may not be filed with cost support data

- NNX. one type of access codes, generally three digits long, used to route calls within an exchange

- No. 5 Crossbar Switching System. . . a two-wire electromechanical switching system that is commonly used in the Bell System for switching calls locally.

- Non-Cost Supported Tariff. tariffs filed without cost support data

- nonTPS. nonTelco Provided Service; sometimes used to refer to a non Telco Provided Service provider

- NPA. Numbering Plan Area; geographical areas within the United States, Canada, and the Carribean each of which is assigned a distinctive three digit access code called an area code, "NPA". Exchange codes, "NNX", are not duplicated within an area, making it possible for each subscriber line to be assigned a unique ten-digit number, "NPA"- "NNX"-XXXX.

- OCC. Other Common Carrier; a telecommunications company that provides interexchange voice communications services in competition with established telephone companies (such as AT&T and the independent telephone companies).

- Property Right. legal rights to use a good or service that are owned or controlled by someone and may be bought or sold. An initial endowment or fallback position. As used here, a right to some given level of interconnection at a given price.

- Rate Base Regulation. regulation that constrains the price charged by a firm allowing only some fixed rate of return on allowed assets.
- Starting Point. the point from which bargaining begins; see property right.
- Subsidy. a payment that results in some prices differing from costs.
- Telco. a regulated telephone company having a monopoly over local distribution of telephone services in at least one local area.
- TPS. Telco Provided Service.

5

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