AT&T EX. 6

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

IN THE MATTER OF THE INTERCONNECTION CONTRACT NEGOTIATIONS BETWEEN AT&T COMMUNICATIONS OF THE PACIFIC NORTHWEST, INC., AND GTE NORTHWEST INCORPORATED PURSUANT TO 47 U.S.C. SECTION 252	))))))	DOCKET NO. UT-960307

DIRECT TESTIMONY OF

JOHN W. MAYO

ON BEHALF OF

AT&T COMMUNICATIONS

OF THE PACIFIC NORTHWEST, INC.

AUGUST 16, 1996

I. EXPERT WITNESS QUALIFICATIONS

Q. WHAT IS YOUR NAME AND ADDRESS?

A. My name is John W. Mayo. My business address is Department of Economics, The University of Tennessee, Knoxville, Tennessee 37996.

Q. WHAT IS YOUR OCCUPATION?

A. I am an economist. My present position is Professor of Economics in the College of Business Administration, The University of Tennessee.

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS.

A. I hold a Ph.D. in economics from Washington University, St. Louis (1982), with a principal field of concentration in industrial organization, which includes the analysis of antitrust and regulation. I also hold both an M.A. (Washington University, 1979) and a B.A. (Hendrix College, Conway, Arkansas, 1977) in economics.

Since my graduation, I have taught economics at both the University of Tennessee and at Virginia Polytechnic Institute (VPI). Also, I have served as the Chief

Economist, Democratic Staff of the U.S. Senate Small Business Committee. Both my research and teaching have centered on the relationship of government and business, with particular emphasis on regulated industries. I have authored numerous articles and research monographs, and have written a comprehensive text entitled Government and Business: The Economics of Antitrust and Regulation (with David L. Kaserman), The Dryden Press, 1995. I have also written a number of specialized articles on economic issues in the telecommunications industry. These articles include discussions of competition and pricing in the telecommunications industry and have appeared or are scheduled to appear in academic journals such as the RAND Journal of Economics, the Journal of Regulatory Economics, the Yale Journal on Regulation and the Journal of Law and Economics. I have also testified before this and other state commissions on telecommunications issues.

Q. HAVE YOU RECENTLY FILED RELATED TESTIMONY BEFORE THIS COMMISSION?

A. Yes. I filed testimony on similar issues in the AT&T-U S WEST arbitration and have modeled this testimony on the

U S WEST testimony with a few appropriate changes.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS HEARING?

A. Virtually all the issues requiring arbitration, including the pricing of interconnection, unbundled network elements and wholesale services, involve questions that are fundamentally economic in nature. As a result, if the ultimate purpose of the 1996 Act - the attainment of effective competition in local exchange telephone markets - is to be realized, sound economic principles pertaining to competitive market performance must govern both the rule-making and implementation processes. Such principles have direct implications for both pricing and provisioning decisions that state commissions will be called upon to make under their review and arbitration responsibilities.

To the extent those regulatory decisions conform to these principles, the purpose of the Act will be served, and consumers will benefit. To the extent that regulatory decisions deviate from these principles, however, the pace of transition to competition will be slow, and competition

will falter. Thus the success of the Act in bringing the benefits of competition to consumers hinges upon the correspondence between the regulatory decisions rendered and the economic principles that apply to competitive markets. Competitive outcomes simply cannot result from decisions that are inconsistent with these principles. Consequently, this testimony has two purposes: to explain those relevant economic principles and to identify at least some of the salient implementation issues to which they apply.

Q. CAN YOU SUMMARIZE THE THEME OF THE TESTIMONY YOU ARE ABOUT TO OFFER?

A. Yes. A number of commentators have described with great optimism the potential for, if not the inevitability of, competition in the market for local exchange telephone service. Mere proclamation of the desirability of competition or mere elimination of the legal institution of monopoly franchises for incumbent local exchange carriers ("ILECs"), however, will not make competition happen. Instead, regulators must adopt a set of competition-enabling policies that act both to promote and to protect competition. With such a set of competition-enabling policies in place, the promise and potential of

competition - lower costs, lower prices, accelerated innovation, and greater consumer choice - can be realized. Without such policies, incumbent monopolists can delay or even foreclose competition and its benefits to consumers.

Accordingly, telecommunications policy in Washington stands at a crossroads. The Commission's policies will either facilitate or frustrate the emergence of competition. I believe that the only sound path for the Commission to take is to adopt the dual strategy of promoting competition wherever feasible and at the same time establishing a set of competitive safeguards to protect the development of competition until it is effective in all telecommunications markets. This approach enhances the prospects for the rapid development of competition and accelerates the day when markets, as opposed to regulators, are fully responsible for resource allocation. The purpose of my testimony, then, is to describe both the general economic principles and specific guideposts that this Commission can, consistent with the 1996 Act, use to implement a competition-enabling policy. Such a policy will benefit consumers and provide competitors an opportunity to compete for the business of local exchange telephone customers.

Q. PLEASE SUMMARIZE THE OVERALL POLICY IMPLICATIONS AND RECOMMENDATIONS OF YOUR TESTIMONY.

A. There are significant economic benefits to be obtained from implementing the pro-competitive requirements of the Telecommunications Act of 1996 in local exchange markets. Local exchange markets currently stand as the last remaining segment of the telecommunications industry to fall to competitive market forces. As such, they now represent the final source of significant monopoly power in this sector of the economy. Hence, the benefits to consumers from policies that will successfully promote competition in this market are likely to be substantial.

Crucial to these policies is the efficient pricing of unbundled network elements (UNE) and interconnection services that are subject to supply under significant monopoly power. Specifically, where competition is not yet effective, as is the case for UNEs, the Commission should establish prices that equal the Total Long-Run Incremental Cost (TLRIC) of providing the UNEs. Also central to the promotion of effective competition in local exchange markets is the emergence of effective retail stage competition for

services that are currently offered by ILECs. Such competition will occur only if the wholesale prices for these services are set at economically efficient levels where those levels correspond to the difference between retail prices and the ILEC's avoided retail costs, i.e., the sum of retail TSLRIC, ILECs' embedded retail costs, and excess economic profit. My testimony explains the theoretical foundation for these pricing policies and describes the benefits that will be created by adopting them. Finally, I discuss a number of "non-price" issues which the Commission will need to address to fulfill the procompetitive purposes of the Act.

Q. HAVE YOU HAD AN OPPORTUNITY TO REVIEW THE AUGUST 8TH FCC ORDER IN THE LOCAL COMPETITION DOCKET?

A. I have conducted a preliminary review of that order.

Q. WHAT ARE YOUR INITIAL IMPRESSIONS REGARDING THE ECONOMIC RECOMMENDATIONS CONTAINED IN THAT ORDER RELATIVE TO THE RECOMMENDATIONS CONTAINED IN YOUR TESTIMONY?

A. The economic principles espoused in the FCC Order appear to

be in general agreement with the pricing and provisioning recommendations I have made here. The Order embraces economic efficiency as the standard for pricing decisions, calling for rates that reflect forward-looking incremental costs that are calculated on a cost-causative basis. It also recognizes the need to address the myriad of non-price strategies an ILEC may use to foreclose entry into local exchange markets and the economic incentive for them to do so. In these and many other important respects, the economic recommendations presented in the FCC's Order are in close harmony with the principles and policies I have advanced in this testimony.

III. BENEFITS OF LOCAL EXCHANGE COMPETITION AND THE TELECOMMUNICATIONS ACT OF 1996

Q. WOULD YOU BRIEFLY EXPLAIN THE CURRENT NATURE OF COMPETITION IN THE TELECOMMUNICATIONS INDUSTRY TODAY?

A. Yes. The nature and scope of competition within the telecommunications industry has changed dramatically in the past two decades. There are many new technologies, services, and firms competing effectively in many sectors of the industry, and with the convergence of computing and

communications technology, traditional boundaries between old industries and emerging industries are breaking down. Telecommunications and related services are an essential and ever-increasing input into all sectors of our economy. Today, customers may purchase telephones and more complex types of terminal equipment from a diverse array of firms offering a huge selection of products and services. Contrast this to the world where you could only lease your phone from Ma Bell, and could get it in "any color you wanted, as long as it was black."

Exemplary of this change has been the transformation within the long distance (interexchange) industry. Since 1984, AT&T's market has fallen from over 90 percent to less than 60 percent by the end of 1993, with further declines to 56% in 1995.[1] Over the same period, consumers have realized substantial gains in the form of significant declines in the inflation-adjusted real prices for long distance telephone service, even after adjusting for the pass through of regulatory-mandated reductions in carrier access charges. This progress resulted in the FCC reclassifying AT&T as a

[1] David L. Kaserman and John W. Mayo "Competition and Asymmetric Regulation in Long-Distance Telecommunication -- An Assessment of the Evidence." CommLaw Conspectus, Vol. 4, Winter 1996, pp. 1-26.

non-dominant carrier in 1995, confirming the assessment that interLATA toll services are effectively competitive.[2]

Local exchange markets, however, have not yet made the transition to competition. While some peripheral entry has occurred in some segments, such entry has not been sufficient to erode the ILEC's substantial monopoly power. As a result, the consumer benefits of policies which will successfully promote competition in this market are likely to be substantial.

Q. PLEASE IDENTIFY OPPORTUNITIES FOR THE EMERGENCE OF LOCAL EXCHANGE COMPETITION.

A. Given appropriate, procompetitive policies, such competition may arise at two distinct levels. Upstream (or wholesale-stage) competition will emerge as new facilities-based entrants build networks which will both complement and compete with the facilities which are now solely available from the ILECs. The upstream (network facilities) and downstream (marketing of services to end-users) stages together comprise the vertical chain of production for local

[2] *See also* Simran Kahai, David L. Kaserman, and John D. Mayo "Is the Dominant Firm Dominant?" An Empirical Analysis of AT&T's Market Power," Journal of Law and Economics, forthcoming.

exchange services. Today, however, the ILEC is a vertically-integrated monopolist in both stages, acting as both the sole provider of local exchange network services and the sole reseller or retailer of those services to end-users in most markets.

Facilities-based, upstream competition ultimately will drive wholesale prices for network services toward costs and will encourage cost reductions as firms deploy more productive, least-cost technologies. Such competition will also result in enhanced network functionality as firms seek to compete on both price and product features. Meanwhile, retail competition will drive end-user retail prices toward costs and will foster an expansion in value-added services. Lower prices for ILEC-supplied inputs such as UNEs and interconnection services will encourage entry of firms offering complementary, value-added services, which will further stimulate competition, innovation, and growth. Business and residential consumers will benefit first from the reduction in prices occurring as a result of retail stage competition. They will also benefit from the expansion in the range of products available. Because advanced communications services are essential to the health

of our economy, there are likely to be longer term benefits from rapidly introducing competition to this last link in the chain -- and significant costs if we fail to introduce competition now.

The ILECs have a strong self-interest in preventing the emergence of local exchange competition, and the entry barriers present in this market are significantly higher than in the other sectors of the telecommunications industry. In markets for customer premise equipment and long distance service, there is significant excess productive capacity and the ownership is quite dispersed. A firm that wants to build a new type of telephone can lease production capacity in the United States or abroad and can purchase all of the needed inputs in competitive markets. An entrant into long distance services can assemble a national network rapidly by leasing bulk transmission and switching capacity in the competitive wholesale markets which exist for interLATA services. This ability to purchase inputs in competitive markets, however, is not the case in local exchange services. In those markets, the ILEC is the sole owner of telephone transmission and switching facilities to reach consumers.

Q. PLEASE EXPLAIN THE SIGNIFICANCE OF THIS MONOPOLY POSITION OF THE ILECS FOR THE EMERGENCE OF WHOLESALE AND RETAIL COMPETITION.

A. Constructing competing facilities will take time, and will not be efficient in all cases. Hence, the evolution of effective competition for network services at the wholesale stage is likely to take years, even if the ILEC's anticompetitive behavior is restrained. As a result, entrants will compete initially using network elements and services purchased from the ILECs. The viability of entry at the wholesale level presumes availability of unbundled network elements (UNEs) and wholesale services (*i.e.*, total service resale) from the ILECs at reasonable prices. Over time, some of these wholesale firms will construct complete end-to-end networks while others will continue to lease facilities from the ILECs and competing wholesalers.

Under appropriate regulatory policies, effective competition is likely to emerge much more quickly at the downstream, retail stage. Indeed, many competitors are likely to enter first as pure retailers, reselling services offered by the ILECs and subsequently integrating backward or upstream as

they construct their own networks. This strategy permits the entrant to collect retail revenues, to gather important market intelligence, and to establish a relationship with consumers while the firm's network is constructed incrementally. Learning about the market and establishing a brand image as a local exchange service provider are challenges which must be faced by each entrant, but not by the ILEC. The upfront marketing costs associated with entering a new market can be substantial, and the revenue which may be captured is uncertain. The ILECs can raise these costs to potential entrants by exploiting their superior information and monopoly power unless they are restrained by effective regulation as required under the terms of the Telecommunications Act of 1996.

IV. ROLE OF EFFICIENT PRICES

Q. WHY ARE PRICING ISSUES AN IMPORTANT ASPECT OF THE ARBITRATION PROCESS?

A. The ability of competitive markets to allocate society's scarce resources most efficiently has been recognized since Adam Smith described in the *Wealth of Nations* the subtle but potent operation of the invisible hand of market forces.

Moreover, the superiority of the economic performance of competitive markets over that of regulated monopoly has become more apparent as our experience with regulation has accumulated.

In a market economy, prices serve as valuable signals for many decisions about resource allocation. For example, high prices encourage consumers to reduce consumption. At the same time, they encourage producers to increase the quantity of the product supplied. The resulting adjustments equilibrate consumption and production of the product. Prices also should guide purchasers to make efficient choices among *different* goods and services offered in the market. Finally, prices serve as traffic signals for entry decisions, directing the flow of productive resources among firms and industries. In the latter role, prices will determine the rate at which entry occurs (and, therefore, the pace at which competition develops) in local exchange markets. Consequently, efficient allocation of society's resources and promotion of competition requires careful attention to the levels at which prices are set through the arbitration process.

Q. WHAT ECONOMIC STANDARDS SHOULD APPLY TO SETTING THOSE PRICES?

A. In the absence of any significant market failures, the fundamental characteristic of efficient prices is that they reflect the marginal or (as is typically measured in the telecommunications industry) incremental costs imposed on the provider to supply the good or service in question.[3] The price that consumers pay for a service measures society's marginal willingness to pay for the last unit produced. Marginal cost measures the marginal value to society of the resources used to produce the last unit. Only if the marginal willingness to pay (price) is equal to the marginal value of the resources employed in production (marginal cost) is the socially optimal level of output realized.

Q. IS COMPETITIVE PRICING CONSISTENT WITH THE TELECOMMUNICATIONS ACT OF 1996?

A. Yes. This landmark legislation calls on state and federal

[3] *See*, for example, Paul A. Samuelson and William D. Nordhaus, *Economics*, Twelfth Edition (New York: McGraw-Hill, 1985), who state (p. 488): "Only when prices of goods and equal to marginal cost is the economy squeezing from its scare resources and limited technical knowledge the maximum of outputs." For a more technical statement, see Peter A. Diamond and James A. Mirrlees, "Optimal Taxation and Public Production, I: Production Efficiently," *American Economic Review* 61 (March 1971), pp. 8-27.

regulators to set or sanction the prices of monopolized inputs that will be required by new entrants into local exchange markets. The levels at which these prices are set will influence strongly the pace at which entry into local exchange markets occurs. Three specific sets of prices are likely to affect this process: (1) interconnection services and unbundled network elements; (2) wholesale services; and (3) interexchange carrier access[4]. I will discuss the first of these pricing issues in this section and will address the second in a subsequent section of this testimony.

V. UNBUNDLED ELEMENT PRICING

Q. HOW SHOULD PRICES BE SET FOR INTERCONNECTION SERVICES AND UNBUNDLED NETWORK ELEMENTS?

A. Section 252(d)(1) of the Telecommunications Act of 1996 requires that the prices charged by incumbent local exchange carriers for interconnection and unbundled network elements be "based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the interconnection or network element," non-discriminatory

[4] I will not address carrier access pricing issues in any detail, but much of what I will say about the pricing of interconnection applies to access services as well.

and that such prices "may include a reasonable profit."

This legislative mandate is consistent with the economic principle of incremental cost pricing. More specifically, the appropriate economic prices that will maximize the benefits to consumers and society of successful transformation of local exchange markets from monopoly to competition, without subsidizing new entrants, is the (per unit output) total service long-run incremental cost (or TSLRIC) of these inputs.[5]

Q. WOULD YOU EXPLAIN SOME OF THE BENEFITS OF PRICING UNBUNDLED ELEMENTS AND INTERCONNECTION SERVICES AT TSLRIC?

A. The recommendation to set monopolized input prices at TSLRIC in order to optimize the pace at which competition develops is supported by many fundamental economic considerations. First, by pricing inputs at their respective TSLRICs, consumers of these inputs will receive accurate signals regarding the costs that their consumption is imposing on the ILEC. Thus, such prices provide consumers of these

[5] Total service long-run incremental cost (TSLRIC) is a measure of the total incremental cost incurred in the long run that is caused by the addition (or deletion) of a service (or network element) from an existing set of services (network elements). I describe the characteristics and measurement of this cost concept in more detail below.

inputs undistorted signals that allow them to make economically efficient resource allocation decisions.

Second, pricing these monopoly inputs at their economically efficient levels avoids distorting the prices of retail-level services that combine these monopoly inputs with other inputs purchased or secured elsewhere. In contrast, any increase in the price above the costs of providing these monopoly inputs will result in higher prices for retail-level services. The resulting high retail rates will dampen usage, the growth of realized telecommunications demand, and, ultimately, the prospects for the emergence of competition in telecommunications markets.

Third, prices that reflect TSLRIC send accurate signals to prospective new entrants concerning the costs that the ILECs are incurring to provide unbundled network elements and interconnection. These accurate signals, in turn, facilitate an efficient entry process that is critical to the development and maintenance of competition.

Alternatively, if the prices of network elements and interconnection were elevated above TSLRIC, prospective

entrants would be sent misleading signals regarding the costs that are currently being incurred in the provision of the inputs. The result is a distorted and inefficient entry process. Consider, for example, what happens if the ILEC's TSLRIC of a network element is $.007 per minute and the price is set at $.014 per minute. In this case, efficient entry is discouraged, because an entrant's costs are driven upward by the inflated input price. Additionally, firms that have (or have access to) network elements that are more costly than those of the ILEC, but which are priced below the ILEC's elements, are inefficiently provided incentives to utilize these higher-cost network elements. These higher costs distort not only the entry process but also the ultimate ability of new firms to be able to generate effective competition for ILECs. Thus, input prices above TSLRIC pour water on the fires of competition.

Fourth, prices that accurately reflect the incremental cost of providing network elements and interconnection minimize barriers to entry into the market. Specifically, barriers to entry are said to occur whenever the costs of operations to a potential entrant are artificially inflated above those of the incumbent. Thus, if the ILECs were permitted to

charge rates for these inputs that exceed the cost of providing them, barriers to entry will be created, because the cost to new entrants for these inputs would exceed the costs incurred by the incumbent. The erection of such barriers is inconsistent with the dictates of a competition-enabling policy.

Fifth, by creating parity in the prices charged by the ILEC with the costs it incurs for network elements and interconnection, the prospects for anticompetitive monopoly leveraging are reduced. Under this policy, the ILEC's incentive and ability to engage in a vertical price squeeze will require that the firm reduce retail prices below the actual incremental cost of providing the retail service. It is relatively unlikely that the firm would embark on such a strategy that purposefully inflicts losses on itself with very uncertain returns in the future. Thus, the pricing of monopoly inputs to reflect their underlying TSLRICs can be seen to more closely align the interests of the firm (to make profits) and those of the society (to avoid monopolistic practices that deter competition and to minimize the need for subsequent regulatory intervention).

Finally, by establishing a set of prices for interconnection and unbundled network elements that reflect the TSLRIC incurred by the ILEC to provide these inputs, commissions will have embraced the long-standing beacon in regulatory economics of cost-causative pricing and will have established congruency between prices and the mandate of Section 252(d)(1) of the Telecommunications Act, which requires that prices be based on cost.[6] Accordingly, the achievement of such prices should be a primary goal of the arbitration process.

Q. WOULD YOU PLEASE EXPLAIN WHY AN IMPUTATION RULE IS REQUIRED, IN ADDITION TO THE PRICING RULES DESCRIBED ABOVE?

A. Yes. For any wholesale stage service or UNE sold by the ILEC under conditions of significant monopoly power and unless all UNEs are priced exactly at TSLRIC, it is necessary to require imputation in order to deter the establishment of a vertical price squeeze. A vertical price squeeze occurs when a vertically integrated firm with significant monopoly power at the upstream stage could not profitably sell at prevailing retail prices if it were to be

[6] It will also satisfy the requirement that the price "may include a reasonable profit" because TSLRIC incorporates a normal return on the capital investment caused by the provision of interconnection service or network elements.

made to pay the same price for upstream-stage inputs as it charges its downstream competitors. The threat of such anticompetitive price squeezes has been recognized by the Commission in the establishment of imputation requirements in the provision of access for toll services provided by US WEST. This same requirement should be extended to protect the emergence of competition in local exchange markets as well.

VI. ECONOMIC PRINCIPLES FOR MEASUREMENT OF TSLRIC

Q. CAN YOU EXPLAIN THE PRINCIPLES WHICH SHOULD BE USED TO MEASURE TSLRIC CORRECTLY?

A. In any regulatory price-setting decision -- for an unbundled network element, discount for wholesale services, or interexchange carrier access services -- a critical element is proper measurement of costs. Economic principles imply that the practical measurement of costs should be determined by five properties. Specifically, correctly measured costs should: (1) be forward-looking; (2) reflect least-cost technologies; (3) measure incremental costs; (4) apply to the long run; and (5) be consistent with cost-causation.

Q. WHY SHOULD COSTS BE FORWARD-LOOKING?

A. Cost calculations should be forward-looking because this is the perspective from which competitive sellers and competitive buyers make decisions. Any cost calculations formed from any other vantage -- for example, historical costs -- would distort the signals offered to consumers, incumbent sellers, and potential market entrants. This, in turn, would reduce the benefits to consumers available from local exchange competition.

In particular, competitive sellers make output and pricing decisions on the basis of how these actions are likely to affect present and future costs and revenues. Neither the existence or absence of sunk costs nor the magnitude of historical costs affect the firm's optimal behavior. Likewise, consumers make choices based on forward-looking assessments. When making purchasing decisions, buyers consider their current and anticipated future incomes. They also assess relative current and future prices. They may even give some thought to the range of products and services which will be available in the future. Past costs, however, are simply unimportant to consumer choice.[7]

[7] Even if the past is used as an indicator of the future, historical information is only important to the extent that it aids consumers and producers in forecasting to make forward-looking decisions.

Q. WHY SHOULD COSTS REFLECT THE BEST AVAILABLE TECHNOLOGY?

A. Cost must also be measured based on the presumption that firms will make the most efficient use of the best available technology. If network element prices are to mirror the costs and prices which would result from the competitive supply of these services, then costs must be determined in this way. Competition forces firms to produce at the lowest possible cost. Firms that fail to adhere to this standard by choosing the wrong technology or by incurring excessive costs do not survive in competitive markets. If the prices to be established are to help foster competitive benefits at the retail level, they must, likewise, stem from cost calculations that reflect the efficient use of modern technology.[8]

Q. WHY FOCUS ON INCREMENTAL COSTS?

A. Practical measures of costs for the purpose at hand should also focus on incremental cost measures. Indeed, while economists use a variety of related cost concepts to

[8] My emphasis here on modern efficient production techniques and technology should not be misconstrued. I am not suggesting that cost should be based on unproven or developmental laboratory technologies. It is the adoption of modern -- but widely available -- technologies that provides the benchmark for the development of efficient cost.

investigate firm behavior and evaluate market performance, it is the concept of incremental cost which is most fundamental to understanding and replicating competitive firm behavior. Incremental cost is defined as the change in total cost given a discrete change in output quantity. For a multiproduct firm, it is common to measure the incremental cost of an entire service, say X, by considering the firm's costs for producing a set of outputs, *e.g.*, A through Z, then to consider the firm's costs for producing the same set of outputs excluding product X. The difference is the incremental cost of producing X. A profit-maximizing firm will choose to produce output X, so long as this incremental cost is less than the incremental addition to total revenues which comes from selling X. This focus on incremental effects is common among all profit-maximizing firms and across all types of market structures.

The concept of incremental cost is also important to the determination of the output quantity which makes the best use of society's resources and thereby maximizes consumers' well-being. This optimal distribution of scarce resources is known as allocative efficiency and is one of the many desirable outcomes of competitive markets. A market outcome

is said to be allocatively efficient if the incremental benefit to the consumer of additional consumption -- as measured by the price this consumer is willing to pay -- is equal to the incremental cost of providing that incremental output. Consequently, if the cost measurements employed are to reflect actual firm behavior within a competitive market and serve as the foundation for the pursuit of allocative efficiency, they must be based on incremental costs.

Q. WHY FOCUS ON LONG-RUN COSTS?

A. Measurements of costs may be either short-run or long-run. In the short run, some costs vary with the quantity of output, and others do not. These are known as variable and fixed costs, respectively. Because incremental costs are calculated based on the change in total costs, given some change in output levels, and because fixed costs do not change in the short run, short-run incremental costs do not include fixed costs. By contrast, however, all costs are variable in the long run. At some point, even the most durable input must be replaced if production is to continue. Consequently, long-run calculations of incremental costs account for such expenditures which might constitute fixed costs in a short-run setting. It is long-run costs that are

the yardstick by which prospective entrants measure the feasibility of entry and investment in an industry; because, by definition, these firms have not yet incurred any fixed costs. Accurate and efficient entry and investment decisions, then, turn upon an accurate assessment of long-run costs.

Q. WHY IS IT IMPORTANT FOR COST MEASUREMENT TO BE CONSISTENT WITH COST CAUSATION?

A. Practical measures of costs should be as consistent as possible with the principles of cost causation. Accurate attribution of costs with their underlying determinants is important for two reasons. First, costs that accurately reflect causation are important for the incumbent firm's decision making and for prospective entrants' assessment of the prevailing cost structure in the market. Thus, accurate assessment and determination of causal cost factors is a key element of correct resource allocation within and across industries. Second, within the context of a mixed market environment wherein an incumbent firm retains significant monopoly power over the provision of inputs sold to downstream competitors, accurate determination of the causal determinants of costs is critical if anticompetitive

practices are to be avoided. In particular, if the incumbent monopoly provider of upstream inputs is able to misassign costs or simply fail to pursue an inquiry into the costs that are caused by the provision of a service, then it is possible for the firm to exploit or even extend that monopoly power to the detriment of the competitive process. Thus, accurate determination of the underlying cost-causal relationships is vital both to economic efficiency and as a tool to protect rivals and consumers against anticompetitive practices.

Q. IS THERE A COST CONCEPT WHICH ACCURATELY REFLECTS THESE PRINCIPLES?

A. Yes. While a variety of cost measures exist, the cost benchmark that best serves to embody the economic principles of cost that we have just described is TSLRIC. It is, therefore, paramount that regulators embrace this approach to cost measurement if economic efficiency and the promotion of competition are to be pursued through the arbitration process.

Q. WOULD YOU RESPOND TO CRITICISMS THAT TSLRIC-BASED PRICES WILL NOT PERMIT ILECS TO REMAIN FINANCIALLY VIABLE?

A. A counterargument often used to oppose adoption of more efficient TSLRIC prices for the ILEC's interconnection services and unbundled network elements is that such prices will not yield sufficient revenues to cover the regulated firm's costs. This argument is presented in a number of guises. First, it is claimed that an ILEC which charged TSLRIC prices for a portion of its services would not be financially viable. Second, it is claimed that these prices will result in the ILEC being unable to recover its investment for a portion of its embedded plant (*i.e.*, a portion of the ILEC's plant will be *stranded*). Third, it is claimed that these prices will return a level of profit to the ILEC which is less than that promised by regulators in the past (*i.e.*, the regulatory compact argument). In all three cases, the arguments amount to a claim that TSLRIC-based prices will inadequately compensate the ILECs for past decisions.

One must be clear: The issue of the financial viability of local exchange providers when a subset of services - inputs sold to downstream competitors under conditions of monopoly power - is priced at economically efficient, incremental cost levels does not deny the widely acknowledged benefits

of efficient pricing. In addition, it is far from clear that pricing a subset of the ILEC's services at incremental cost levels will, in practice, fail to generate adequate revenues for the firm to remain financially viable. Moreover, if such arguments are used to justify cross-subsidies and transfers and to continue them in the future by embedding them in component pricing, then local exchange competition will not succeed and the Telecommunications Act of 1996 will have failed. The success of competition requires that regulators avoid using ILECs' historical accounting investment data to compute forward-looking TSLRICs, thereby embedding ILEC cost inefficiencies, recovery of excess investment (*e.g.*, broadband "gold-plating") and monopoly mark-ups into component pricing. Regulatory policies that attempt to maintain incumbents' profits while promoting competition are fundamentally incompatible.

Some parties have also misunderstood the costs included in TSLRIC. Because long-run incremental cost is an *economic* cost, it includes a normal profit on the provision of the service in question. Because it is a *long-run* cost, it includes the user cost of capital on fixed assets or

overhead that can be causally attributed to that service. The premise that efficient prices necessarily fail to cover costs is fundamentally flawed.

Q. ARE THERE OTHER CRITICISMS OF TSLRIC-BASED PRICES TO WHICH YOU WOULD LIKE TO RESPOND?

A. Other, more subtle, arguments have also been offered, including: (1) claims of natural monopoly, (2) the presence of common costs, (3) the need to generate subsidy flows within the regulated firm to support the universal service objective, and (4) the need to grant higher prices to ILECs to compensate them for irreversible investments made under uncertainty. Regardless of which of these rationales is employed, the argument fails to provide an adequate justification of the proposed departures from efficient prices, especially input prices paid by competitors.

Q. PLEASE RESPOND TO THE CRITIQUE THAT LOCAL EXCHANGE MARKETS ARE A NATURAL MONOPOLY.

A. Recent work by economists concludes that natural monopoly conditions do not appear to extend to fully cover the set of services provided by local exchange companies.[9] Moreover,

[9] *See* Richard T. Shin and John S. Ying, "Unnatural Monopolies Local Telephone," *RAND*

policymakers at both the state and federal levels have embraced competition and the elimination of barriers to entry, apparently concurring with the conclusion that the set of services offered by local exchange companies are not naturally monopolistic.

Q. PLEASE RESPOND TO THE CRITIQUE THAT TSLRIC-BASED PRICES WILL NOT RECOVER JOINT AND COMMON COSTS.

A. Some ILECs have argued that prices for network elements must be marked up *significantly* above TSLRIC to permit recovery of costs that are shared among multiple network elements. This is incorrect. In order to understand this issue more clearly, we have found it useful to pose the following three questions:

1. If ILEC-supplied monopoly inputs are priced at TSLRIC, will the ILEC's total costs exceed its total revenues?

2. If TSLRIC prices for ILEC-supplied inputs do generate a revenue shortfall (*i.e.*, if the answer to question 1 is yes), should regulators ensure that the ILEC is made whole?

Journal of Economics 23 (Summer 1992), pp. 171-187.

3. If TSLRIC prices for ILEC-supplied inputs do generate a revenue shortfall and the ILEC is entitled to recover at least some portion of it, how should the necessary revenues be recovered?

Consider each of these questions in turn.

I have seen no evidence that the answer to the first question is yes, and there are many reasons to believe that it is no. First, I am not proposing that all of the ILEC's revenue-generating services be priced at TSLRIC -- only certain services and unbundled elements over which the ILEC retains substantial monopoly power that are purchased by competitors attempting to enter local exchange markets. ILECs currently sell many other services and products (*e.g.*, vertical services and yellow pages) that are priced well in excess of their costs. As a result, it is not at all clear that pricing this competitively-important subset of services at TSLRIC will create a revenue shortfall.

Second, unless there are substantial common costs present in the ILEC's network operations, TSLRIC prices will be fully compensatory. Some recent evidence suggests that the magnitude of common costs in this industry has been greatly

exaggerated.[10] If that is, indeed, the case, then implementing TSLRIC prices for interconnection services and unbundled network elements will not create a revenue shortfall. Third, with prices established at today's TSLRIC, if the ILECs are successful at reducing costs in the future, profit opportunities are created. And finally, as the curtain opens on the more competitive era in telecommunications, a host of new profit and growth opportunities are becoming available for ILECs. Pricing UNEs to recover their respective TSLRICs will fully compensate the ILEC for the costs caused by the provision of the UNE (including a competitive return to the underlying assets required to produce the UNE). Beyond this competitive compensation for these network elements and interconnection, the ILEC's profit potential should be limited only by its own ingenuity, efficiency and creativity in satisfying consumer demands. Therefore, assertions to

[10] As William Baumol, Janusz Ordover, and Robert Willig note, this claim is unwarranted:
We understand that the portion of forward-looking costs that is unattributable to particular network elements is likely to be small. The aggregative categories of network elements generally comprise discrete physical facilities - loop, switching, transport, and signalling. Economies of scope, or cost subadditivities, among these categories are likely to be minimal or nonexistent. To the extent that there are non-trivial common or shared costs, among network elements, it is crucial that the [Federal Communications] Commission establish strict limits on their recovery to avert arbitrary additives significantly above TSLRIC, which could undermine the efficiencies and protection of competition offered by the TSLRIC benchmark.
See Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig, In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, p. 14.

the contrary notwithstanding, TSLRIC pricing of UNEs and interconnection is unlikely to pose any serious financial viability constraints on the incumbent local exchange companies. Therefore, the answer to question 1 is clearly not an unambiguous yes and may, in fact, be no.

Turning to question 2, we are convinced that the theoretically correct answer is no or, at least, that the ILECs should not be fully compensated. First, it is not clear that the traditional regulatory compact, even as interpreted in the landmark Hope Natural Gas case, ever promised (or could promise) normal profits under all circumstances.[11] Many firms (both regulated and unregulated) have weathered prolonged periods of losses without exiting their industries. Thus, a regulatory policy that would require that the ILECs' profits be positive in every period would not make sense. Rather, it is my understanding that the Hope Natural Gas doctrine does not guarantee an actual return, but simply a reasonable opportunity to achieve a reasonable return on assets prudently and efficiently deployed to provide the services in question. Further, as noted above, regulatory

[11] Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 601 (1944).

commissions simply cannot simultaneously continue to hold the ILECs harmless and promote any sort of meaningful competition in local exchange markets. Protection of competitors is fundamentally incompatible with promotion of competition. Competition forces firms to minimize common costs, thereby promoting efficiency and consumer welfare (via lower prices). Therefore, as local exchange markets begin to evolve toward competition, ILEC appeals to be made whole (particularly at the expense of their competitors) should be ignored.

Suppose, however, that, despite the above considerations, we were to decide that the correct answer to questions 1 and 2 is an unambiguous yes. That is, suppose we decide that revenue shortfalls will be caused by TSLRIC pricing of ILEC-supplied inputs and that the ILECs should be at least partially, if not fully, compensated. Then, and only then, does question 3 arise. As explained above, however, the theoretically correct answer to this question leads us once again to endorse TSLRIC prices for interconnection services and unbundled network elements. That is, if additional revenues are required beyond those realized under TSLRIC input prices, then these revenues should be recovered

directly from all end users in a competitively neutral fashion. We should not distort the input prices paid by the ILEC's potential or actual competitors to collect these revenues. Therefore, these inputs should be priced at TSLRIC, regardless of the answers to questions 1 and 2.

Q. PLEASE RESPOND TO THE CRITICISM THAT SUPRA-TSLRIC PRICES ARE REQUIRED TO FUND UNIVERSAL SERVICE.

A. Universal service requirements do not and should not require distortions of efficient pricing for interconnection elements. Using prices higher than TSLRIC to fund universal service violates the spirit of both a movement toward more competitive local exchange markets and the Telecommunications Act of 1996. Universal service requirements can and should be funded (and distributed) on a competitively neutral basis that does not require abandonment of TSLRIC-based pricing.

Q. PLEASE RESPOND TO THE CRITICISM THAT TSLRIC-BASED PRICES WILL NOT ADEQUATELY COMPENSATE THE FIRM FOR IRREVERSIBLE INVESTMENTS MADE UNDER UNCERTAINTY.

A. Some ILEC experts argue that TSLRIC fails to include sufficient allowances for depreciation owing both to

expected declines in the prices of capital goods (*e.g.*, switches) and to uncertainty faced by ILECs in making irreversible investments.[12] These claims are incorrect. These effects and certain effects of uncertainty are incorporated in TSLRIC calculations indirectly, and are reflected in the economic lives and discount rates used. In any event, while some of the ILECs' plant investment may not be reversible, this is not true of all of the investment.[13]

Finally, even if efficient prices do fail to cover the regulated firm's current (embedded) costs, they may still generate sufficient revenues to cover the lower costs that will be realized in a more competitive environment.[14] That

---

[12] *See Reply Affidavit of Jerry A. Hausman,* In the Matter of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket no. 96-98, May 30, 1996.

[13] For example, much of the switch and switching center investment is clearly not irreversible. Switches can be moved to new locations, and the end-office real estate can be sold. Rights of way, conduit, and even excess wire-line facilities, which may face reduced demand for ordinary telephone lines, may be sold for other uses. Hausman's examples assume that ILECs' entire investment is irreversible. Because the ILEC could always sell its plant to another firm, a portion of this investment is clearly recoverable. Indeed at times, ILECs even sell entire exchanges. (*See Order Granting Motion to Strike, Approving Settlement, Approving Discontinuance, Approving Transfer of Certificates, and Terminating Docket*, Docket No. SPU-96-3, State of Iowa, Department of Commerce, Utilities Board, May 30, 1996.) Finally, evidence about ILEC depreciation suggests that most of the capital stock invested prior to 1990 will soon be replaced anyway. *See Reply Affidavit of Lee L. Selwyn and Patricia D. Kravtin,* In the Matter of Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, May 30, 1996.

[14] The obvious example is the interLATA market, in which profitability has been sustained in the face of substantial price reductions. See Robert E. Hall, "Long Distance: Public Benefits from Increased Competition," Menlo Park: Applied Economic Partners, October 1993; and *Declaration of Glenn Hubbard and William Lehr, in United States of America v. Western Electric Company and American Telephone and Telegraph Company, U. S D. C., Civil Action No. 82-192, November 1994.*
Profitability has also been sustained in the face of price reductions in other

is, the firm's costs are not immutable. As with other industries that have undergone a similar transformation, the emergence of competition in local exchange markets is likely to result in substantial efficiency gains that will reduce costs considerably. As a result, the same set of prices which generate revenues to recover the ILEC's current costs would yield excess profits in the future, when costs are lower. Regulators should not assume that the firm's costs are completely exogenous.

Q. HOW CAN REGULATORS ESTIMATE TSLRIC-BASED PRICES?

A. To implement this pricing recommendation, regulators will need to adopt a costing methodology that is capable of providing reasonably accurate estimates of the TSLRICs of the interconnection services and unbundled network elements that new entrants will be purchasing from the ILECs.

VII. THE PRICING OF WHOLESALE SERVICES

Q. IS THERE AN ECONOMIC DISTINCTION BETWEEN THE SALE OF UNBUNDLED NETWORK ELEMENTS AND WHOLESALE SERVICES?

---

recently deregulated industries, such as banking and trucking.

A. Yes. Under the "unbundled network elements" scenario, a new entrant into a local exchange market has at least two options available. First, the entrant may choose to purchase a complete package of unbundled elements (including the loop, switch, and local transport) that will enable it to supply end-user services in direct competition with the ILEC. That is, it may enter with no local network facilities of its own. This so-called platform approach offers several desirable economic properties. For example, by purchasing unbundled elements, the new entrant may be able to devise and configure new service offerings that better meet particular customer needs, thereby serving market niches that would otherwise go unserved. In addition, the flexibility of supply created by allowing new entrants to purchase the complete package of network elements at efficient prices can help to constrain the ILEC's ability to foreclose entry through various alternative strategic actions.[15]

Under the second entry option using the unbundled network element approach, the new entrant may purchase a subset of the ILEC's network elements and combine those elements with

[15] I will discuss some of these exclusionary strategies below.

other network components that are either self-supplied or purchased from some other provider(s) in order to produce some end-user service that, again, may or may not correspond directly to an end-user service of the ILEC. That is, these unbundled elements supplied by the ILEC are simply inputs into a production process. The particular output or service that process yields is determined by the firm purchasing those inputs. It is not constrained by the existing output mix of the ILEC from which the unbundled elements are bought. As a result, the firm's success in the marketplace will depend upon its ingenuity in designing service offerings that better meet consumers' preferences and its efficiency in combining inputs to produce those service offerings at competitive prices. Moreover, this second approach allows for partial facilities-based competition at the retail stage and permits an incremental investment strategy that ultimately will promote competition at the wholesale stage as well.

Wholesale services, on the other hand, are discounted versions of the ILEC's underlying retail products. A new entrant purchasing a wholesale service, then, must compete directly with the corresponding retail service that the ILEC

is already selling. As a result, the feasibility of entering the market as a reseller of wholesale services is directly contingent upon the relationship (or spread) between the existing price of the retail service and the price of the wholesale service. That difference, in percentage terms, is referred to as the wholesale discount. Obviously, the level at which that discount is set--and not the specific price at which the wholesale service itself is set--will influence the incentive to enter the local exchange market as a reseller.

As a consequence, the pricing problem presented by wholesale services is somewhat different from the pricing problem presented by unbundled network elements. Specifically, the wholesale pricing problem must incorporate the retail rate charged for the end-user service, whereas the UNE pricing problem need only reflect the appropriate incremental costs. Despite this difference, however, the economic principles that apply to these problems are precisely the same.

Q. IS THE DISTINCTION BETWEEN THESE PRICING PROBLEMS RECOGNIZED IN THE 1996 ACT?

A. Yes. The 1996 Act appears to recognize both this difference

and the commonality of the economic principles involved. The Act specifies that wholesale discounts be set equal to the costs the ILEC will avoid by selling at the wholesale stage versus the retail stage. Specifically, Section 252(d)(3) provides that state commissions are to determine "wholesale rates on the basis of retail sales charged to subscribers--excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier."

Thus, the Act clearly recognizes the need to incorporate the retail rate charged by the ILEC when establishing the wholesale rate to be paid by resellers competing with that ILEC. Moreover, the avoided cost concept also suggests that the wholesale discount should reflect incremental costs--here, the incremental costs of an output reduction.

Q. IS THIS PROVISION CONSISTENT WITH THE DICTATES OF EFFICIENT PRICING?

A. Under an appropriate definition of the "costs that will be avoided," it is entirely consistent with efficient pricing principles. Specifically, avoided costs should be defined

to include all of the long-run incremental costs associated with the retail activities of the ILEC that will be avoided when the ILEC ceases to perform those retail activities. Conceptually, such avoided costs consist of three basic components: (1) the long-run incremental costs that an efficient provider of the retail function would incur (*i.e.*, the TSLRIC of the retail stage); (2) any additional costs that the ILEC currently incurs in the provision of retail services that are attributable to production inefficiencies (*i.e.*, any organizational slack or "fat" contained in the ILEC's observed costs at the retail stage); and (3) any positive economic profit earned by the ILEC at the retail stage (where positive economic profit is the excess above a normal return on the firm's activities at this stage).[16]

The first component consists of the costs avoided by an economically efficient supplier of retail services that is minimizing cost and earning a normal accounting profit (*i.e.*, a competitive return). The second and third components (fat and excess profits) are arguably the most avoidable of all avoided costs. If the ILEC no longer

[16] If economic profits are negative, this component should be set equal to zero. I will address this case in more detail below.

provides the retail services, then it no longer bears the cost inefficiencies that it formerly incurred in the provision of those services. Likewise, it is no longer entitled (if it ever was) to any excess profits associated with its retail operations. Consequently, the concept of avoided costs should incorporate all three components, because all three will, in fact, be avoided. We refer to this guidepost for establishing the efficient wholesale discount as the "avoided cost pricing rule." The application of this rule to the pricing of GTE's wholesale services will yield economically efficient (and, therefore, procompetitive) outcomes.[17] Moreover, this rule is consistent with the Section 252(d)(3) provision.

Q. DOES APPLICATION OF THE AVOIDED COST PRICING RULE RESULT IN AN ECONOMICALLY EFFICIENT PRICE FOR WHOLESALE SERVICES?

A. Whether application of this rule will lead to an economically efficient wholesale price depends upon the efficiency of the retail price to which the (efficient) wholesale discount is applied. Two simple cases help to

[17] By "efficient outcomes" we mean that the resulting wholesale rate will support efficient entry but deny inefficient entry, where "efficient entry" means entry by firms that are able to perform the retail function at costs that are equal to or less than the ILEC's costs.

explain this point.

In the first case, the price the ILEC charges for the retail service is equal to or greater than the costs the ILEC incurs in providing this service. In other words, the ILEC experiences non-negative (*i.e.*, either positive or zero) economic profits in selling this service.[18] In this case, application of the avoided cost pricing rule (where avoided costs include all three of the components identified above) will, in fact, result in an economically efficient wholesale rate. That is, the wholesale discount dictated by this rule will result in a wholesale rate, assuming no inefficiency at the wholesale level, equal to the TSLRIC of providing the upstream, wholesale service.

A simple example can be used to illustrate this point. Suppose the TSLRIC of providing the wholesale service is $7 per month. Also, suppose the (efficient) TSLRIC of providing the retail portion of the service is an additional $5 per month, yielding a total TSLRIC of the overall service of $12 per month. Assume initially that the ILEC providing

[18] It is important to remember that a zero economic profit translates into a positive accounting profit that yields a normal (competitive) return on the firm's invested assets.

this service is economically efficient (*i.e.*, its operations contain no fat) and it is earning a normal (competitive) accounting profit. Under these circumstances, the retail price must be equal to the sum of the TSLRICs of the two vertical stages--wholesale plus retail. Thus, the retail price from which the wholesale discount is subtracted is $12. With neither fat nor excess profit at the retail stage, avoided cost is simply the TSLRIC of performing the retail function which, in this example, is $5. Thus, assuming no fat or inefficiency at the wholesale stage, application of the avoided cost pricing rule yields a wholesale discount of $5 or a wholesale rate of $7, which is precisely equal to the TSLRIC of providing the wholesale service.[19]

This wholesale rate promotes economic efficiency at both of the vertical stages of production. At the retail stage, the $5 discount encourages efficient reseller entry and

[19] In this particular case, the avoided cost pricing rule yields outcomes that are precisely equal to those of the so-called Efficient Component Pricing Rule (ECPR). That is, both yield desirable economic efficiency and competition-enabling properties. This correspondence of results between these two pricing rules, however, is not general. Moreover, the general inapplicability of the ECPR to pricing in the telecommunications industry has recently been pointed out by the developers of the ECPR concept. *See* Affidavit of William J. Baumol, Janusz Ordover, and Robert D. Willig, *supra*. *See also* the recent substantive critique of the ECPR by Nicholas Economides and Lawrence J. White, "Access and Interconnection Pricing: How Efficient Is the 'Efficient Component Pricing Rule'?" Antitrust Bulletin, Vol. 40 (Fall 1995), pp. 557-579.

discourages inefficient reseller entry. Any potential entrant that can perform the retail function at an incremental cost equal to or below the incremental cost incurred by the ILEC is encouraged to enter and provide that function, thereby placing downward pressure on the price charged to consumers. And any potential entrant that incurs retailing costs greater than the ILEC is discouraged from entering.

Importantly, these same efficiency properties will continue to hold under the proposed rule in the presence of inefficient production by the ILEC and/or excess profits. For example, suppose that, in addition to the $5 TSLRIC at the retail stage, the ILEC incurs an additional $2 in production inefficiencies and an additional $2 in excess profit. In this situation, the retail price is $16 per month ($7 wholesale TSLRIC, plus $5 retail TSLRIC, plus $2 fat, plus $2 economic profit). But this price minus the wholesale discount provided by the avoided costs (which are now equal to $9) still yields the efficient wholesale rate of $7. Moreover, this rate still promotes efficient entry decisions at both the retail and wholesale stages.

Most importantly, unlike some proposed rules, this efficient discount allows competitive market forces to be unleashed on the ILEC's inefficient and overpriced retail operations. Specifically, an efficient entrant paying $7 for the wholesale service will be able to undercut the ILEC at the retail stage, pushing the final product price downward toward the competitive ($12) level. Thus, under this rule, market forces will provide consumers the benefits of competitive retailing, placing pressure on the ILEC to improve the efficiency of its retail operations. Thus, whenever the retail price is equal to or greater than the costs the ILEC incurs, application of the avoided cost rule promotes economic efficiency and provides consumer benefits at both stages.[20] If, instead of the proposed avoided cost pricing rule, we were to subtract only the TSLRIC of an efficient firm at the retail stage, however, the effect would be to insulate the ILEC's inefficiency and excess profit from the forces of competition. Under this approach, the wholesale rate would be set at $11 (the retail price of

[20] Note that the $9 discount along with the retail price of $16 can encourage entry by firms that have incremental costs that exceed those of a fully efficient provider of the retail service (*i.e.*, the TSLRIC at the retail stage which, here, is $5). Nonetheless, the rule only encourages entry by firms that are at least as (or more) efficient than the ILEC. Moreover, even inefficient entry will tend to move retail prices closer to competitive levels in the presence of monopoly. *See* Economides and White, *supra*.

$16 minus the retail stage TSLRIC or $5). At this wholesale rate, an efficient entrant will be unable to undercut the incumbent's price; and, as a result, the beneficial effects of entry are greatly attenuated. Neither inefficiency nor excess profits are exposed to market forces. Consequently, the ILEC is effectively indemnified from competition at customers' expense.

Suppose a second case, however, where the retail price is, for whatever reason, held below the ILEC's overall cost of providing the service (*i.e.*, the service is being subsidized). In this case, application of the avoided cost pricing rule will still produce an efficient wholesale discount, but it generally will fail to produce an efficient, TSLRIC, wholesale rate. Quite simply, an efficient discount applied to an inefficient price yields another inefficient price. Importantly, however, application of the avoided cost pricing rule in this case allows competition to arise in the provision of the retail portion of the overall service despite the existence of the below-cost price. In so doing, it maximizes the consumer benefits achievable in the presence of the retail-stage pricing distortion.

Here, again, a simple example is instructive. Assume we have the same TSLRICs used in the preceding example. To simplify the analysis, we further assume that the ILEC's operations are efficient (*i.e.*, we assume zero fat).[21] Here, however, we assume the ILEC earns negative profits of $2 per month on each unit of the service provided. Thus, the retail price charged for this service is now $10 per month ($7 wholesale TSLRIC, plus $5 retail TSLRIC, minus the $2 in negative profit). Because negative profits are not avoided by selling at wholesale versus retail, the $2 loss involved in the sale of this service does not enter into the calculation of the efficient wholesale discount. That is, negative profits do not constitute avoided costs.[22] As a result, the discount in this case is simply the $5 in avoided costs (*i.e.*, the TSLRIC of the retail function). Therefore, the wholesale price under the avoided cost rule is reduced to $5 in this situation. Notice that this price

[21] Relaxation of this assumption would not alter the conclusions of this analysis.

[22] The ILEC will continue to incur the $2 in negative profits as long as the retail price remains at the $10 subsidized level even if it ceases to perform the retail function. As I explain below, the only way to foster resale entry in the presence of the subsidy is to shift that subsidy to the wholesale rate. When that is done, the $2 loss is merely transferred to the wholesale service and, therefore, is not avoided. If the subsidy is not shifted to the wholesale stage, resale entry will not occur. The ILEC, then, will continue to perform the retail function and will continue to bear the $2 loss. Therefore, negative profits are not an avoided cost.

is below its corresponding TSLRIC by the same amount ($2) that the retail price is held below the total TSLRIC of providing the overall service. Thus, the subsidy here is merely shifted from the retail to the wholesale stage.

What, then, are the efficiency properties of this below-cost wholesale price? The fundamental efficiency property is that, as with the preceding case, efficient entry at the retail stage will be encouraged and inefficient entry at that stage will be discouraged. With a wholesale price of $5 and a retail price of $10, any potential entrant that can perform the retail function at an incremental cost of $5 or less (the TSLRIC an efficient ILEC incurs to perform that function) will have an incentive to enter the market on a resale basis. And any potential entrant whose incremental costs exceed $5 cannot profitably enter. Thus, by preserving the incentive for efficient resale entry, the avoided cost pricing rule enables competition to arise at the retail stage of production despite the presence of the below-cost price.

Q. IN YOUR SECOND CASE, WILL THE BELOW-COST WHOLESALE PRICE TEND TO DISCOURAGE FACILITIES-BASED ENTRY AT THE WHOLESALE

STAGE?

A. No. In this case, facilities-based entry at the wholesale stage is already effectively foreclosed by the retail price which has been set below cost. Setting the wholesale price below cost by an equal amount has no independent or additional effect on the incentive for facilities-based entry to occur. The culprit here is the retail rate, not the wholesale rate. Indeed, no pricing standard of which I am aware can provide an incentive to enter at the wholesale stage so long as the retail rate remains below cost.

For example, suppose regulators attempt to preserve what might mistakenly be perceived to be an efficient incentive for entry at the wholesale stage by setting the wholesale rate equal to the TSLRIC of providing the wholesale service (which is $7) while continuing to hold the retail rate below cost (at $10). Under this wholesale pricing proposal, no entry will occur at either stage. Obviously, entry as a reseller will be foreclosed. With a wholesale rate of $7, a retail price of $10, and an efficient TSLRIC of performing the retail function of $5, even a firm that is more efficient than the ILEC in carrying out retail operations cannot successfully enter on a resale basis. And, with no

resellers in the market, entry as a pure wholesaler is not feasible. Finally, entry as a vertically integrated carrier providing both the wholesale and retail functions is also foreclosed, because the $10 retail price fails to cover the $12 costs incurred by an efficient firm operating at both vertical stages. Thus, incremental cost (TSLRIC) pricing at the wholesale stage in the presence of a subsidy at the retail stage is a formula for preserving monopoly at both stages. It is a policy that is clearly at odds with the legislative intent of the 1996 Act to promote competition as well as the interests of consumers.

Q. BY SETTING THE WHOLESALE PRICE BELOW TSLRIC IN THIS SECOND CASE, WON'T THE ILECS BE SUBSIDIZING THEIR COMPETITORS?

A. No. As long as the retail rate remains below cost, competitors will receive no subsidy. While the wholesale rate does fall below the ILEC's TSLRIC of providing the wholesale service under the proposed avoided cost approach, the entire subsidy flows through to final consumers as a consequence of the equally subsidized retail rates. That is, with the wholesale discount set equal to the correctly defined avoided costs, the wholesale rate is subsidized only to the extent the retail rate is also subsidized. As a

result, the ILEC's resale competitors receive no subsidy under this policy.

Q. WILL THE AVOIDED COST PRICING RULE YIELD EFFICIENT OUTCOMES IN THE PRESENCE OF UNEQUAL INTERCONNECTION AND PROVISIONING ARRANGEMENTS?

A. It will not achieve efficiency under these circumstances unless an appropriate adjustment is made. To this point, I have implicitly assumed that the wholesale services purchased by resellers are completely equivalent to the retail services provided by the ILEC in all relevant respects. In other words, I have assumed that the quality, timeliness of delivery, etc. are identical. That assumption, however, is extremely unlikely to hold in local exchange markets during the transition to competition. Rather, as this transition unfolds, it is virtually inevitable that the interconnection and provisioning arrangements provided to resellers will be inferior in myriad respects.

In the presence of such inferior resale arrangements, a pro forma application of the avoided cost pricing rule will fail to provide efficient entry signals. Specifically, if

resellers attempting to enter local exchange markets cannot receive and process customers' orders in a convenient and timely manner and provide services that are equal in quality to that provided by the ILEC, then even perfectly efficient wholesale discounts will fail to promote efficient entry. Under competitive conditions, one simply cannot market successfully an inferior product at an equal price.

Q. DOES THE ACT RECOGNIZE THIS NEED FOR EQUAL INTERCONNECTION AND PROVISIONING ARRANGEMENTS?

A. Yes. Recognizing this problem, Congress incorporated a provision requiring the ILECs to provide equal interconnection to their competitors. Specifically, Section 251(c)(2)(C) of the Act requires ILECs to provide interconnection "that is at least equal in quality to that provided by the local exchange carrier to itself."

Despite this legislative requirement, however, various non-price strategic actions available to the ILECs make the likelihood of fully equal interconnection and provisioning services extremely remote at this point. As a practical matter, virtually any anticompetitive end achievable through manipulation of input and/or output prices can also be

achieved through some sort of non-price strategy.[23] As the Rochester experiment and numerous other examples have already made clear, new entrants into local exchange markets will face a host of non-price exclusionary tactics.[24] And even the best efforts of the most conscientious regulators will prove inadequate to prevent them. Indeed, the impossibility of successfully enforcing equal interconnection to the bottleneck facilities of a vertically integrated monopoly was the primary justification for the 1984 divestiture. The avenues through which ILECs can impede the ability of competitors to successfully reach their end customers are simply too numerous, complex, and subtle for legislators to foresee and regulators to police.

Q. CAN THE AVOIDED COST PRICING RULE BE AMENDED TO INCORPORATE THE EFFECTS OF UNEQUAL INTERCONNECTION AND PROVISIONING

---

[23] The provision of discriminatory or unequal interconnection can be seen as a strategy to raise rivals' costs. *See* S. Salop and D. Scheffman, "Raising Rivals' Costs," American Economic Review, Vol. 73 (May 1983), pp. 267-281.

[24] *See* Mike Mills, "The Front Line for Phone Lines: Bell Atlantic Has Been 'Fighting Tooth and Nail' to Beat Back Competition," Washington Post, October 17, 1994, F1, which reports an instance in which Bell Atlantic refused to allow employees of a competitor to use its restroom facilities. Additional examples of this sort of behavior are described in Leslie Cauley, "Calls Waiting: Rivals Are Hung Up on Baby Bells' Control Over Local Markets," Wall Street Journal, Tuesday, October 24, 1995, pp. A1, A6. Moreover, strategic use of discriminatory interconnection to support monopolization is not new in the telecommunications industry. For an historical discussion of such practices, *see* David F. Weiman and Richard C. Levin, "Preying for Monopoly? The Case of Southern Bell Telephone Company, 1894-1912," Journal of Political Economy, Vol. 102 (1994), pp. 103-126.

ARRANGEMENTS?

A. Yes. This rule can easily be amended to incorporate such effects. Specifically, the wholesale discounts applied to the ILEC's retail prices should exceed avoided costs in the presence of unequal interconnection and provisioning arrangements. Such an additional discount can be justified on several grounds. First, consumers generally are not willing to purchase an inferior product in the absence of a price incentive to do so - *i.e.*, a discount. As a result, the presence of unequal or inferior interconnection warrants a reduction in the retail rate from which the wholesale discount is subtracted or, equivalently, a total discount from the ILEC's rates that exceeds explicitly avoided costs. Second, the additional discount can be used to compensate the victims of discriminatory interconnection. Firms that have been subjected to such behavior suffer opportunity costs in the form of profits that are lower than the profits that would have been realized with fully equal interconnection.[25] Without such compensation, these firms may refrain from entering local exchange markets. And third, the additional discount may be justified as an

[25] The opportunity costs imposed by unequal interconnection provided the fundamental economic justification for the 55 percent discount on access charges paid by AT&T's competitors prior to the implementation of equal access in the interLATA market

explicit public policy measure designed to promote reseller entry in light of the competitive benefits such entry is expected to bring. Thus, a wholesale discount that exceeds avoided costs can be justified on sound economic grounds.

Q. WHAT WOULD BE THE ECONOMIC EFFECT OF RESTRICTIONS ON THE RANGE OF SERVICES AVAILABLE FOR RESALE?

A. Restrictions on the subset of services which are available for resale may allow the ILEC to bypass the intent of the resale provisions and engage in anticompetitive price discrimination. Requiring the ILECs to allow unrestricted resale of their services, as provided for in Section 251 (b)(1) of the Telecommunications Act, can help prevent these firms from practicing anticompetitive price discrimination among their customers. Price discrimination occurs when the ratio of the price of a given product to its marginal cost varies across different customer groups or services. For example, charging business customers a higher price than residential customers for local telephone service (where the price difference is not warranted by a corresponding difference in cost) constitutes price discrimination.

In situations where a multiproduct regulated firm operates

in a mixed market environment, price discrimination can be employed for anticompetitive purposes.[26] Specifically, in markets where entry is threatened, the ILEC may be able to offer price discounts only to those customer groups most likely to purchase the services of the new or potential entrants. When used in this systematic, targeted way, price discrimination among customer groups can forestall entry and, thereby, preserve the monopoly status of the local exchange company in the affected market, while simultaneously preserving lucrative pricing in market areas and services that do not yet face a credible threat of competitive entry.

A necessary condition for price discrimination to occur is that the price-discriminating firm must be able to prevent its low-price customers from buying the product and then reselling it to the high-price customers. Otherwise, the attempt to sustain the non-cost-based price difference will be frustrated by the profitable arbitrage opportunities

[26] *See, e.g.*, F. M. Scherer and David Ross *Industrial Market Structure and Economic Performance*, Third Edition (Boston, MA: Houghton Mifflin Company), 1990, pp. 500-502. Not all price discrimination is anticompetitive, however. Thus, a blanket rule prohibiting price discrimination by all firms cannot be justified on economic grounds. For a discussion of the conditions under which economic welfare may improve with price discrimination, *see* Richard Schmalensee "Output and Welfare Implications of Monopolistic Third-Degree Price Discrimination," *American Economic Review* 71 (March 1981), pp. 242-247; and Hal Varian "Price Discrimination and Social Welfare," *American Economic Review* 75 (September 1985), pp. 870-875.

presented. The price-discriminating firm can successfully prevent such arbitrage if it can restrict resale of its output. Consequently, prohibiting local exchange companies from placing restrictions on resale of their services in their tariffs is necessary for preventing price discrimination by these firms and, thereby, provides an additional safeguard against monopoly leveraging.

VIII. NON-PRICE COMPETITIVE ISSUES

Q. WHY ARE NON-PRICE COMPETITIVE ISSUES RELEVANT TO THIS ARBITRATION PROCEEDING?

A. Successful resolution of pricing issues will be in vain unless myriad other non-price terms of sale are also made conducive to resale entry. Neither pure resellers nor firms purchasing unbundled network elements will be able to enter local exchange markets successfully if the ILECs are able to discriminate in the quality and timeliness of the interconnection and provisioning services they supply to their competitors. Through inferior or untimely interconnection and provisioning services, ILECs can sustain their extant monopoly power against the threat of entry. Consequently, this Commission needs to devote at least as

much attention to non-price competitive issues as it does to the pricing issues discussed above.

Q. WHAT SORTS OF NON-PRICE ISSUES ARE LIKELY TO ARISE DURING THE ARBITRATION PROCESS?

A. Two broad types of non-price competitive issues are likely to emerge. First, and most obvious, technical interconnection and provisioning issues - such as number portability, dialing parity, and service ordering capabilities - will be confronted. Due to both technological aspects of the existing network and strategic actions (and non-actions) undertaken by the ILECs, the inputs supplied to entrants are likely to be physically inferior to the inputs supplied by the ILECs to themselves. In fact, I understand that GTE has refused to provide new entrants inputs that are at parity with those GTE provides itself. Regardless of the source, such inferiority will hamper the entry process and delay the advent of competition.

Second, it must be recognized throughout the arbitration process that no monopolist can ever be expected to negotiate

contracts that facilitate entry into its own market.[27] Under normal competitive contracting, both parties to the negotiation have something to gain. As a result, both parties are willing participants in the negotiation process, and both are anxious to reach an agreement so that the gains from trade can be realized. Under monopoly conditions, however, where one party is attempting to negotiate the terms of supply of inputs that are needed to enter the other party's monopolized market, such mutual benefits are not present. The monopolist simply has nothing to gain and much to lose from an agreement that successfully facilitates entry and, thereby, erodes its monopoly power. It is, in fact, negotiating the demise of its monopoly position. GTE has even less incentive than the RBOCs because it does not have to satisfy the "competitive checklist" in order to enter the interLATA market.

This incentive for recalcitrance is present for both price and non-price features of the relationship that ultimately will be fashioned between the ILEC and its local exchange competitors. But while the ILEC's attempts to cling to its

[27] Indeed, if buyers could successfully negotiate competitive prices from a monopolist, there would be no need for regulation or antitrust laws.

monopoly power through pricing are explicit and easily detected, non-price monopoly preserving actions will be considerably more difficult to detect.

Q. PLEASE EXPLAIN HOW GTE CAN UTILIZE NON-PRICE TERMS OF SALE TO EXCLUDE COMPETITORS FROM ITS MARKETS.

A. The exclusionary effects achievable by manipulating the non-price terms of sale can easily be explained by analogy to a vertical price-cost squeeze. Under a vertical price squeeze, competitors are either denied entry and/or forced to exit by pricing inputs above costs while holding output (retail) prices relatively low, thereby eliminating the possibility of profitable production at the downstream stage.

The success of this strategy obviously hinges upon the impact of higher input prices on competitors' costs. But raising input prices is only one of many strategies capable of raising rivals' costs.[28] For example, an ILEC may require competitors to interconnect at a particular point or adopt a specific interconnection arrangement that prevents

[28] On the profitability of raising rivals' costs, *see* Steven C. Salop and David T. Scheffman, Supra.

these firms from making efficient use of their existing or planned networks. Any number of other non-price terms of sale can have a similar cost-increasing effect. Therefore, raising rivals' costs through the provision of unfavorable non-price terms of sale can have precisely the same exclusionary effects as a vertical price-cost squeeze.

Q. IN YOUR OPINION, SHOULD ALL NEW ENTRANTS BE FORCED TO ACCEPT THE SAME AGREEMENT?

A. No. Potential entrants into local exchange markets will have widely varying requirements for network interconnection and unbundled elements as a result of the different avenues through which entry is expected to occur. That is, interexchange carriers, competitive access providers, cable TV companies, and wireless communications providers are likely to have very different technological requirements for interconnection with the ILEC's network. Moreover, even a given entrant's interconnection needs are likely to change over time as it begins to construct its own facilities. The new Act's Section 251(c)(2)(B) requirement that the ILECs provide interconnection at any technically feasible point within the carrier's network would appear to be adopted to accommodate this multiplicity of interconnection needs.

Further, if one entrant chooses to interconnect at point A and another entrant chooses to interconnect at point B, that does not constitute discrimination in the provision of interconnection services. In fact, in the presence of divergent interconnection needs, a requirement that all entrants utilize a uniform interconnection at an identical point in the network would constitute discrimination.[29]

This clear need for flexible, non-identical interconnection arrangements is mirrored in the contractual provisions required by new entrants. Just as their network configurations and technological requirements differ, so too do their needs for specific contract terms. For example, one entrant may have no plans to develop its own network and, consequently, may be willing to sign a long-term contract for a particular set of wholesale services or unbundled network elements. Another entrant, however, may plan to invest in network facilities as its customer base grows and, therefore, may not wish to be constrained by a similar long-term obligation. One entrant may be a new firm

[29] An analogy would be to interpret a requirement for non-discrimination in the provision of medical services to mean that all patients suffering from chest pains must be treated with triple-bypass heart surgery. Identical treatment of non-identical situations is just as discriminatory as non-identical treatment of identical situations.

with no brand-name capital and, consequently, may be relatively insensitive to the quality of service it is able to provide to its customers by reselling the ILEC's services. Another firm, however, may have substantial brand-name capital that could be severely depreciated by provision of inferior service. Moreover, such depreciation may carry over into other markets in which the firm competes. As a result, the former company may be willing to sign a contract that contains no quality assurance provisions whereas the latter company may not. These and a host of other differences in entry strategies, histories, and corporate structures may dictate markedly different contractual needs.

In its arbitration deliberations, this Commission must recognize that: (1) GTE has a strong economic incentive to exclude competitors from its market; and (2) such exclusion may be accomplished through the input prices that it charges, technical interconnection arrangements it provides, and the contractual provisions it offers. Close attention must be devoted to all sources of exclusionary effects if competition in local exchange markets is to develop.

Q. WHAT IS YOUR RECOMMENDATION CONCERNING THIS COMMISSION'S ACTIONS ON THESE NON-PRICE COMPETITIVE ISSUES?

A. In my opinion, the Commission should: (1) strictly enforce the flexible and equal interconnection provisions of the Act and institute explicit penalties for failure to perform; and (2) arbitrate contractual provisions, requiring GTE to meet reasonable requests for individualized terms and, again, incorporate explicit provisions containing penalties for non-performance. Such actions, in combination with the pricing recommendations made earlier in this testimony, will be necessary if the ILECs' hold on local exchange markets is to be broken and the powerful forces of competition are to be unleashed.

IX. SUMMARY

Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

A. Yes. Under the provisions of the Telecommunications Act of 1996, state regulatory commissions are assigned responsibility for arbitrating disputes between ILECs and their potential competitors in situations where voluntary negotiations have failed to produce a mutually-agreeable contract. The fundamental issues involved in this

arbitration process are likely to be: (1) the prices charged for ILEC-supplied inputs that entrants will need in order to compete in local exchange markets on a resale basis (interconnection services, unbundled network elements, and wholesale services); and (2) the various non-price terms of sale (both technological and contractual) that will accompany these prices. The outcome of this arbitration process will be critical in determining whether and how soon we have viable competition in local exchange markets. Consequently, the Commission should take its arbitration responsibilities very seriously and should adopt policy decisions that will move these markets toward competition as expeditiously as possible. Substantial benefits for consumers lay in the balance.

My testimony presents the basic economic principles and specific pricing and provisioning recommendations that will achieve this objective. Specifically, this Commission should: (1) set the prices for interconnection services and unbundled network elements at their respective TSLRICs; (2) set wholesale discounts equal to or, in the presence of unequal interconnection, greater than avoided costs, where such costs include the TSLRICs of the retail stage plus

inefficiencies (or fat) and any excess economic profits; and (3) require equal interconnection and provisioning arrangements and truly nondiscriminatory contractual provisions that recognize the different needs of the various companies attempting to enter these markets.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.