DIRECT TESTIMONY OF

DAVID L. KASERMAN

ON BEHALF OF

AT&T COMMUNICATIONS OF THE SOUTHERN STATES, INC.

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Docket No. 960847-TP

I. QUALIFICATIONS AND PURPOSE OF TESTIMONY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is David L. Kaserman. My business address is the Department of Economics, College of Business, 415 West Magnolia -- Room 203, Auburn University, Auburn, Alabama, 36849-5242.

Q. WHAT IS YOUR OCCUPATION?

A. I am an economist. My current position is Torchmark Professor of Economics at Auburn University.

Q. WOULD YOU PLEASE SUMMARIZE YOUR QUALIFICATIONS?

A. I hold a Ph.D. degree in Economics from the University of Florida. My principal field of interest is industrial organization, which encompasses the areas of antitrust economics and the economics of regulation. I have over twenty years of experience as a professional economist and have held positions both in government agencies

(e.g., the U.S. Federal Trade Commission) and in academic institutions. In addition, I have consulted on and testified in numerous antitrust cases and regulatory hearings. My primary research interest is in the application of microeconomic analysis to public policy issues, and that interest is reflected in my publications.

Over the past twelve years, I have focused much of my research on public policy issues surrounding the telecommunications industry, particularly those issues created by the emergence of competition in the various markets that comprise that industry. That research has resulted in the publication of more than a dozen papers on this subject, with several more papers currently in progress. I also have recently published a major textbook dealing with the economics of antitrust and regulation. In addition, over this same period, I have testified on telecommunications policy issues in more than fifteen states and before the Federal Communications Commission.

Q. HAVE YOU PREPARED A VITA THAT DESCRIBES YOUR EDUCATION, PUBLICATIONS. AND EMPLOYMENT HISTORY?

A. Yes. A copy of my most recent vita is attached as Exhibit 1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been asked by AT&T to prepare this testimony in support of its petition to this Commission for arbitration with GTE under the provisions of Section 252 of the Telecommunications Act of 1996 (the Act). Toward that end, my testimony

addresses four specific topics: (1) the pressing need to implement policies that will promote entry into local exchange markets; (2) the economically efficient pricing standard to apply to local interconnection services and unbundled network elements; (3) the economically efficient pricing standard to apply to wholesale services; and (4) other non-price competitive issues that affect the ability of efficient competitors to enter local exchange markets.

Throughout this testimony, I will attempt to explain the fundamental economic principles that should guide the Commission's arbitration decisions concerning these important topics. Adherence to these principles will ensure that Florida consumers begin to receive the myriad benefits of more competitive local exchange markets as rapidly as possible. It will also help to ensure that the competition that emerges is both efficient and sustainable.

II. THE NEED TO PROMOTE ENTRY INTO LOCAL EXCHANGE MARKETS

Q. WHY SHOULD THIS COMMISSION FAVOR ARBITRATION DECISIONS THAT WILL PROMOTE ENTRY INTO LOCAL EXCHANGE MARKETS?

A. Local exchange telephone markets currently stand as the last remaining segment of the telecommunications industry to fall to competitive market forces. They now represent the final source of significant monopoly power in this sector of the economy. As a result, the consumer benefits of policies that will successfully promote competition in these markets are likely to be quite substantial.

Such competition may arise at two distinct levels, which may be conceptualized as the retail and wholesale stages of the local exchange market. The retail stage involves marketing and delivery of end user services (e.g., services directly involved in reaching the customer -- marketing, billing, collection, operator services and directory assistance to customers), while the wholesale stage provides basic network functionalities (e.g., local exchange switching, transmission, signal processing and connection with the customer location) that are used to produce these end-user services.

Retail-stage services may be provided by a carrier entering the local market and obtaining from an incumbent local exchange carrier ("ILEC") the inputs the competitor carrier needs. Here, a new entrant may use the existing facilities of an incumbent carrier such as GTE, but add value in the manner the new entrant presents these services to the customer.[i/]

Services at the wholesale stage, however, require that the new entrant construct from scratch the facilities required to provide these functions -- i.e., become a facilities-based carrier.

While effective competition eventually may arise at both stages, its prospects are currently much brighter at the retail level. Competition at the wholesale stage will require tremendous capital expenditures to fully replicate local exchange networks with the existing technology and, therefore, is not likely to occur either rapidly or on a geographically ubiquitous basis. Instead, competition at this stage is likely to

proceed slowly and to focus largely on the more cost effective urban areas for some time to come. At least for the immediate future, considerable emphasis must be placed on competition at the retail stage -- both through resale and unbundled network element based services -- as the most viable vehicle for pro-competitive change. Such retail competition will yield both immediate and long term benefits to consumers.

Q. WHAT IMMEDIATE BENEFITS ARE EXPECTED TO EMERGE FROM ENTRY INTO LOCAL EXCHANGE MARKETS?

A. Consumers will benefit immediately and directly from retail competition both in reduced costs and expanded service offerings. Other markets that have undergone a similar transformation from monopoly to competitive supply invariably have experienced such beneficial effects from retail competition during the early stages of competition. Even when limited to the retail stage, competitive rivalry imposes pressures to improve performance that even the most conscientious regulators cannot replicate. Such pressures lead to innovative production and marketing strategies that lower costs and increase the quality and variety of products offered to consumers.

Indeed, holding quality constant, under appropriate (competitive) pricing standards, the only firms that will have an incentive to enter the retail stage will be those firms that can perform the retail function at costs that are equal to or below those of the ILECs. Moreover, unlike facilities-based (or wholesale-stage) entry which requires substantial investment, retail-stage entry will enable competitive market forces to

surface rapidly and on a geographically widespread basis.

Q. WHAT LONG-TERM BENEFITS ARE EXPECTED TO RESULT FROM RETAIL COMPETITION IN LOCAL EXCHANGE MARKETS?

A. The promotion of retail competition may provide the most expeditious path toward facilities-based entry as well. Development of a customer base through successful retail entry can provide the antidote to the substantial sunk costs required for facilities-based entry into local exchange markets. That is, once a competitor has successfully entered the retail stage of a local exchange market via resale of the ILEC's wholesale services or unbundled elements, developing identity and goodwill with customers, the risks of investing in the network facilities required to provide these services (investments which may not be recovered if entry is not successful) will be lowered substantially. Moreover, once the new entrant begins to develop its own local network facilities, the ability to purchase unbundled network elements from the ILEC at competitive prices will allow such development to proceed incrementally and in a cost-minimizing fashion.

The experience of interexchange resellers that gradually became facilities-based carriers provides a stellar example to substantiate this argument. MCI, Sprint, and all other non-AT&T facilities-based competitors initially entered the interexchange market as resellers. Successful promotion of retail competition will provide additional benefits by paving the way for a more rapid growth of facilities-based competition, just as it did in the long distance industry.

Q. WILL RETAIL COMPETITION ACHIEVED THROUGH RESALE AND UNBUNDLED ELEMENTS ELIMINATE THE ILECS' MONOPOLY POWER AND, THEREFORE, THE NEED FOR CONTINUED REGULATION OF THESE FIRMS' PRICING AND PROVISIONING DECISIONS?

A. No. While the beneficial effects of retail competition should not be underestimated, it must be recognized that substantial monopoly power in the provision of wholesale-stage services will remain until widespread facilities-based competition emerges. Due to the presence of such monopoly power and the economic incentive of the ILEC to utilize that power to exclude competitors from its markets at both the retail and wholesale stages, regulators will have a crucial role to play in controlling the ILECs' behavior for the foreseeable future.

Transformation of local exchange markets from monopoly to competition is likely to be a prolonged, contentious, and complex process, and its success will hinge largely upon the ability and willingness of regulatory commissions to implement and enforce efficient pro-competitive policies.

Q. IS GTE LIKELY TO VOLUNTARILY ADOPT EFFICIENT ENTRY-FACILITATING PRICING AND PROVISIONING POLICIES?

A. No. Monopoly power such as that held by GTE is a valuable asset that is not likely to be surrendered voluntarily. As a result, voluntary bilateral negotiations with a monopolist are unlikely to bear competitive fruit. Thus, despite the Act's

requirement in Section 251(c)(1)'s that the ILECs negotiate in good faith, it is not likely that such negotiations will yield the complete pricing and provisioning agreements necessary for successful entry.

Indeed, as an economic matter, it is likely that Congress anticipated the failure of voluntary negotiations to provide an adequate resolution of the terms needed for entry. That anticipation, in turn, motivated the Act's provision for the arbitration process in which we are now engaged. Throughout this process, regulators should expect GTE and other ILECs to adopt strategies that: (1) foreclose new firms from entering their markets; (2) encourage existing firms to exit their markets; and (3) extend their monopoly power to other markets. The economics literature refers to these types of anti-competitive strategies as preemption, predation, and monopoly leveraging, respectively. They are designed to maintain, regain, and augment the incumbent's firm's pre-existing monopoly power.

Q. IS THERE ANY REASON THAT GTE MAY BE EVEN LESS WILLING THAN THE BELL OPERATING COMPANIES TO NEGOTIATE AN INTERCONNECTION AGREEMENT THAT WILL FACILITATE ENTRY INTO THEIR LOCAL EXCHANGE MARKETS?

A. Yes. GTE is not subject to the Section 271 provision of the 1996 Act which prohibits the Bell companies from reentering the interLATA market until a certain level of competition (as defined by a checklist of market conditions) is realized. In fact, GTE is already selling both local and long distance services within its regions and has begun joint marketing of these services in several areas. Moreover, the

early indications are that these efforts are experiencing considerable success.

This unique joint-marketing capability places GTE in a strategically advantageous position relative to the interexchange carriers (IXCs). Specifically, until the IXCs are able to enter GTE's local exchange markets, GTE will be the sole supplier of the vertically integrated end-to-end service that most analysts expect to be in very high demand.

Importantly, this competitive advantage is not a manifestation of any superior production efficiencies or innovative service designs. That is, it is not attributable to superior performance by GTE in the marketplace. Rather, it stems from a regulatory-induced advantage that is not shared by GTE's potential competitors. As a result, the competitive scales are being tilted in GTE's favor by an asymmetry in regulatory policy in this regard.

Q. WHAT ARE THE IMPLICATIONS OF THIS REGULATORY INDUCED ADVANTAGE FOR THE COMMISSION'S ARBITRATION EFFORTS?

A. I believe there are two important implications for the arbitration process. First, the Commission should be mindful that GTE lacks any incentive whatsoever to voluntarily negotiate entry-facilitating interconnection agreements. It is likely to be an extremely reluctant participant in the Act's prescribed negotiation process and it is equally likely to be uncooperative in the subsequent arbitration. The longer GTE can forestall entry into its local exchange markets, the greater the head start it will accumulate in the joint marketing of long-distance and local services. There is a real

opportunity here for GTE to strategically exploit the regulatory process to gain a marketplace advantage. It is unlikely to miss that opportunity.

Second, because GTE has already begun to secure this advantage, there is an additional urgency to conclude the arbitration process as rapidly as possible so that GTE's customers can begin to experience some choice in selecting a vertically integrated carrier. Until new entrants such as AT&T can successfully enter GTE's local exchange markets, consumers in these areas will face a monopoly not only for local service but for the bundled local/long distance offering as well.

Thus, the Commission should strive to: (1) complete the arbitration quickly, and (2) specify the terms of its arbitration order to facilitate entry as expeditiously as possible. Otherwise, GTE will be the beneficiary of a regulatory-sanctioned marketing advantage that will tend to entrench its extant market power. Such an outcome is contrary to both the intent of the 1996 Act and the interests of consumers.

Q. WHAT ARE SPECIFIC ACTIONS AN ILEC MAY TAKE IN ORDER TO PRESERVE ITS MONOPOLY POSITION?

A. The specific actions an ILEC may take to maintain its monopoly are quite numerous. They can involve both price and non-price terms of sale. With regard to the former, a vertical price-cost squeeze may be used to force competitors from a market or prevent potential competitors from entering. For example, entry into GTE's intraLATA toll markets has been frustrated by its pricing access services high

in relation to the rates GTE charges for its toll services.

Similarly, a refusal to interconnect or the provision of inferior interconnection can have an equivalent effect. For example, a requirement that a new entrant interconnect at a predetermined single point or adopt a specific type of interconnection can increase the entrant's costs by preventing the firm from making efficient use of its network.

Additionally, a refusal to provide specific contractual terms that a potential entrant may require (e.g., quality of service standards with explicit penalties for non-performance) can have similar exclusionary effects.[ii/] As a result, regulators will need to enforce explicit pro-competitive policies pertaining to all aspects of the ILECs' behavior--pricing, provisioning, and contracting -- if the desired market transformation is to be achieved.

Q. IS THERE A DANGER THAT PROMOTION OF RETAIL COMPETITION WILL TEND TO DISCOURAGE FACILITIES-BASED ENTRY?

A. As I explained above, as long as retail competition is fostered through efficient, pro-competitive pricing and provisioning policies, it will tend to promote, rather than discourage, facilities-based entry. Specifically, as long as such competition is not subsidized by pricing wholesale services and unbundled network elements below the relevant economic costs of providing these products, the incentive for facilities-based entry to occur is not dampened in the least by successful resale entry.

The pricing principles I will explain later in this testimony and the specific pricing standards that result from these principles are subsidy-free. As a result, there is no conflict between these standards and the legitimate desire to promote facilities-based competition. Under the correct pricing standards, the two forms of entry are complements, not substitutes. I turn, now, to these pricing standards.

III. THE PRICING OF INTERCONNECTION SERVICES AND UNBUNDLED NETWORK ELEMENTS

Q. WHAT IS THE FUNDAMENTAL ATTRIBUTE OF ECONOMICALLY EFFICIENT 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.[iii/] 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 (i.e., the price of a good) is equal to the marginal (or incremental) value of the resources employed in production (i.e., the marginal cost of a good) is the socially optimal level of output realized.[iv/]

Q. COULD YOU PLEASE ILLUSTRATE THIS POINT?

A. Yes. Assume the price of some product, say pencils, exceeds the incremental cost of production. Specifically, suppose that the price of pencils is 23¢ and the incremental cost is 14¢. An economist would say that there is a socially sub-optimal level (or an under-allocation) of resources being devoted to the production of pencils.

The reason is that at the prevailing price there are consumers who value the good more highly than it costs the firm (or, more generally, society) to produce the good. Because they do not value the good more than the inflated price, however, they are economically and inefficiently denied consumption of the good. That is, despite the fact that they value the next unit of the good 9¢ more than it costs society to produce that next unit, additional consumption does not occur. In this situation, then, society's resources are fundamentally misallocated. The solution to this misallocation occurs when (and only when) price reflects the incremental (or marginal) cost of production.

Q. WHY IS IT IMPORTANT FOR THE FLORIDA COMMISSION TO APPLY EFFICIENT PRICING PRINCIPLES IN ITS ARBITRATION DECISIONS?

A. In a free market economy, prices serve an extremely important role as signals for resource allocation decisions of all types. For example, high prices encourage consumers to cut back on consumption. At the same time, they encourage producers to increase the quantity of the product supplied. The resulting adjustments provide an equilibrium between production and consumption of the product. With regard to entry decisions, prices serve as traffic signals, directing the flow of productive

resources between industries. Consequently, efficient allocation of resources and promotion of competition require very careful attention to the level at which regulators set prices. Specifically, prices must be established at economically efficient (i.e., incremental cost) levels if efficient and pro-competitive outcomes are to be encouraged.

Traditional regulatory pricing policies, however, have not always pursued efficiency. Frequently, other regulatory objectives have dominated efficiency considerations in price making decisions.[v] As a result, regulated price structures have typically contained substantial elements of cross-subsidization, where the price to one group of consumers exceeds cost in order to hold the price to another group of consumers below cost.[vi] The resulting departure of price from cost creates economic inefficiency in both the subsidized and subsidizing markets.

Where both of these markets are subject to monopoly supply with entry prohibited by regulatory fiat, such inefficient cross-subsidization policies, while harmful to social welfare, can be sustained. Where entry barriers are relaxed, however, the presence of inefficient prices (such as those that accompany cross-subsidization policies) creates distorted incentives for entry decisions, and eventually these prices become unsustainable.

Specifically, in markets where price is held above cost (that is, the markets that are generating the subsidies), entry may be artificially encouraged. Such entry, in turn, forces these prices downward, thereby eliminating the source of the cross subsidy. In markets where price is held below cost (that is, the markets that are receiving the

subsidies), entry is discouraged. Indeed, there is no more effective entry barrier than a below-cost price. It makes little sense, then, to relax legal and regulatory barriers to entry and then set prices below costs through the regulatory process (except where such prices are necessary to compensate for other prices which are below cost). Such a pricing policy is, in effect, regulatory-enforced predatory (or preemptive) pricing.

Therefore, as local exchange markets evolve from monopoly to competition, it is absolutely essential that regulators abandon existing policies of cross-subsidization and inefficient pricing and substitute efficient pricing structures. Once entry is allowed, it is imperative that the correct signals be given to market participants -- particularly potential entrants -- to direct the efficient flow of resources into these markets. Just as faulty traffic signals can cause serious accidents, faulty price signals can cause serious inefficiencies.

Q. GIVEN THE PRICING PRINCIPLE YOU HAVE IDENTIFIED, AT WHAT SPECIFIC LEVEL SHOULD THE COMMISSION SET THE PRICES FOR INTERCONNECTION SERVICES AND UNBUNDLED NETWORK ELEMENTS?

A. Interconnection services and unbundled network elements are crucial inputs that new entrants will need to purchase from GTE in order to compete at the retail stage in local exchange markets in Florida.[vii/]

In order to promote efficient entry at the retail stage, the price these entrants should

pay for these inputs is equal to the incremental cost that GTE incurs to provide them. Moreover, due to the multiproduct nature of GTE's operations, the relevant cost to which prices should be equated is what is known as the total service long-run incremental cost, or TSLRIC.[viii/]

TSLRIC is the theoretically correct basis for pricing these inputs for several reasons.[ix/] First, TSLRIC is an incremental cost. As a result, socially optimal purchase and entry decisions will be fostered with prices set at this level. Second, TSLRIC is long-run in nature. Because the decision to enter a market is, by definition, a long-run decision, TSLRIC prices will send economically correct signals to potential entrants. Third, TSLRIC is an economic cost. As such, it includes a normal (competitive) profit on the capital that is invested to provide the relevant service or element. And fourth, the concept applies to total service costs, which means that all costs that can be causally attributed to production of the product in question are incorporated in these prices. Thus, TSLRIC prices for interconnection services and unbundled network elements are subsidy-free and economically efficient. Such prices will promote efficient and sustainable competition in local exchange markets.

Q. IS THE POLICY RECOMMENDATION THAT THESE PRICES BE SET EQUAL TO TSLRIC CONSISTENT WITH THE TELECOMMUNICATIONS ACT OF 1996?

A. Yes. Section 252(d)(1) of the Act requires that the prices for interconnection services 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 ..."

Moreover, this Section further indicates that these prices "may include a reasonable profit."

Because TSLRIC prices are, in fact, equal to the long-run incremental cost of providing these inputs, including a normal profit on the causally attributable invested capital, the Act's criteria are fully satisfied by such prices.

In addition, the clear and overriding intent of this legislation is to promote competition in local exchange markets. That is, the Act's primary purpose is to put in place a set of pricing and provisioning regulatory policies that eventually will foster a structural transformation of these markets from monopoly to competition. For reasons explained above, that transformation depends heavily upon successful entry by firms that, for some time, will be dependent upon the ILECs for certain network functions and components for which there is currently no alternative. As a result, it is crucially important that these functions and components -- interconnection services and unbundled network elements -- be priced at economically efficient TSLRIC levels. Otherwise, the entry process will be distorted, and the desired market transformation will be artificially delayed. Thus, TSLRIC pricing of these inputs is not only consistent with the letter of this Act, it is also consistent with the Act's overall objectives.

Further, Section 252(d)(2)(A), dealing with charges for transport and termination of traffic, specifies that:

> . . . a State commission shall not consider the terms and conditions for reciprocal compensation to be just and reasonable unless -
>
> (i) such terms and conditions provide for the mutual and reciprocal recovery by each carrier of costs associated with the transport and termination on each carrier's network facilities of calls that originate on the network facilities of the other carrier; and
>
> (ii) such terms and conditions determine such costs on the basis of a reasonable approximation of the additional costs of terminating such calls. [Emphasis added.]

Thus, prices based upon the principles of cost causation (linkage of costs to the product giving rise to these costs) and incremental costs appear to be envisioned by the Act. Again, TSLRIC prices correspond directly with these principles and, therefore, clearly satisfy the Act's criteria.

Q. IS THIS PRICING RECOMMENDATION ALSO CONSISTENT WITH THE TRADITIONAL ECONOMIC CRITERION OF MAXIMIZATION OF SOCIAL WELFARE?

A. Yes, TSLRIC pricing is entirely consistent with that criterion. Social welfare as used by economists essentially is a reflection of the overall well-being of the

community involved, including both the consumers and producers of the product. Maximization of social welfare insures that both groups receive the greatest level of satisfaction attainable from existing resources.

Economists typically arrive at their pricing recommendations by solving a constrained optimization problem wherein some specific objective function (or goal) is maximized or minimized, subject to a given set of constraints. In the usual situation involving regulatory pricing recommendations, prices have been chosen to maximize social welfare subject to the constraint that the market is a natural monopoly[x/]

Due to the technological and economic feasibility of transforming local exchange markets from monopoly to competition, however, the assumption of a static natural monopoly market structure no longer provides an appropriate foundation from which to derive pricing recommendations. Instead, recognizing the tremendous benefits that will flow from a successful transformation of these markets from monopoly to competition, we should select prices for monopolized inputs, such as interconnection services and unbundled network elements, that optimize the pace at which such competition emerges.[xi/]

Because interconnection services and unbundled network elements constitute vital monopoly-controlled inputs that will be required by new entrants into local exchange markets, the lower these prices are set, the more rapid will be the development of resale competition. Viable competition that will be sustainable in the long run, however, cannot be fostered by subsidizing the entry process. The

prices for interconnection services and unbundled network elements should be subject to the constraint that they be subsidy-free.

The revised optimization problem we now face, then, is to find a set of input prices that will maximize the welfare of the community served by optimizing the pace at which local exchange competition develops subject to the constraint that these prices be subsidy free. The obvious solution to this problem is to set these input prices at the lowest unsubsidized level. That level, in turn, is equal to the (per unit) TSLRIC of these inputs. Consequently, setting these prices at TSLRIC is consistent with the traditional economic criterion of maximizing social welfare.

Q. ARE THERE OTHER BENEFICIAL PROPERTIES OF TSLRIC PRICES FOR LOCAL INTERCONNECTION AND UNBUNDLED NETWORK ELEMENTS?

A. Yes. In addition to promoting a rapid development of local exchange competition, TSLRIC prices for interconnection services and unbundled network elements exhibit several additional beneficial properties.

First, such prices promote efficient entry decisions. A firm considering entry will compare its expected post-entry revenues to its expected costs. Where the former exceed the latter, profitable entry is feasible. Expected costs, however, are influenced directly by the prices the ILEC such as GTE charges for the inputs it sells to its competitors. If those input prices are held above their respective TSLRICs, the entry decision will be artificially distorted. Consider, for example, the consequences

of setting the price of an unbundled element at $4 per month if the TSLRIC of that element is only $2 per month. In that case, an efficient firm considering an entry strategy that requires purchase of that particular network element will be inefficiently discouraged from entering. As a general proposition, input prices that exceed TSLRIC artificially dampen the new entrants incentive to enter. Such prices create a disadvantage for the new entrant from the start.[xii/]

Second, a similar conclusion holds with respect to potential entrants' and new competitors' make-or-buy decisions. Such firms must decide which network elements to purchase from the ILEC and which elements to supply or construct themselves. These decisions are founded squarely on a comparison of the incremental costs of the two alternative sources of supply -- one being the entrant's incremental cost of purchasing the element from the ILEC (simply the price that must be paid for it) and the other being the incremental cost of constructing that element anew. If the ILEC's price is held above its incremental cost of providing that network element (i.e., its TSLRIC), an artificial incentive is created for the new entrant to supply that element itself. As a result, the ILEC's existing network infrastructure will be under-utilized and industry costs will be increased unnecessarily. Moreover, the higher costs experienced by the firms that have been artificially encouraged to self-supply undermines the ability of market forces to push the ILEC's retail product prices downward toward competitive levels. As a result, the intensity of competition is dampened.

Finally, by creating parity between the prices charged by the ILEC and the costs the ILEC incurs to provide interconnection services and unbundled network elements,

the prospects for anti-competitive behavior are reduced. For example, the ILEC's incentive and ability to engage in a vertical price squeeze against its competitors are reduced by establishing prices for ILEC-supplied monopoly inputs that accurately reflect incremental costs. The reason is that, with upstream prices equal to costs, any attempt by an ILEC to price predatorily at the downstream stage will require the firm to reduce retail prices below its own 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 on the uncertain prospect that it will be able to recover these losses in the future.

Thus, the pricing of inputs to reflect their underlying TSLRICs can be seen to more closely align the self-interest of the ILEC (to make profits) with the interests of society (both to avoid monopolistic practices that deter competition and to minimize the need for subsequent regulatory intervention).

Q. IF YOUR RECOMMENDATION IS ADOPTED AND INTERCONNECTION SERVICES AND UNBUNDLED NETWORK ELEMENTS ARE PRICED AT TSLRIC, IS GTE LIKELY TO EXPERIENCE A REVENUE SHORTFALL?

A. No. Claims that strict adherence to efficient pricing principles would bankrupt the ILECs have been employed by various advocates of inefficient prices for decades. The alleged "justification" for raising certain (monopoly) local exchange prices above incremental costs have included: (1) claims of natural monopoly; (2) the alleged presence of ILEC common costs, which may not be captured in incremental cost measures; (3) the need to recover ILEC embedded costs or ensure a return on

stranded investment; and (4) the need to generate subsidy flows within the regulated firm to support the universal service objective.[xiii]

Regardless of which of these alleged rationales is employed, the argument fails to provide an adequate justification of the proposed departures from efficient prices, especially input prices paid by competitors for unbundled elements or interconnection services. For instance, natural monopoly conditions no longer appear to extend over the full set of services provided by local exchange companies.[xiv/] Moreover, the perception that TSLRIC prices will automatically fail to cover firm costs often stems, at least in part, from some fairly common misconceptions concerning what is properly included in the firm's prices under this cost concept. In particular, some parties have failed to recognize that: (1) because long-run incremental cost is an economic cost, it includes a normal profit on the provision of the service in question; and (2) because it is a long run cost, it includes the cost of any fixed assets (or overhead) that can be causally attributed to that service. Therefore, the fundamental premise underlying this argument -- that efficient prices necessarily will fail to cover costs -- is questionable.

Even if efficient prices do fail to cover the regulated firm's current costs (which are likely to be inflated both by embedded costs and inefficiencies), they may still generate sufficient revenues to cover the lower (economic) costs that will be realized in a more competitive environment. That is, the ILEC's costs are not immutable. GTE's rising profits under current price cap regulation demonstrate this. Regulation of a monopoly has a pronounced tendency to inflate observed costs above those attainable under more competitive conditions.

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 that generate insufficient revenues today may yield sufficient revenues tomorrow. Regulators should not assume that the ILEC's costs are completely generated by external forces. Substantial portions of these costs may be within the control of the ILEC itself and these costs will fall with the advent of competition.

Q. IF THE FLORIDA COMMISSION DETERMINES THAT SOME OF GTE'S PRICES SHOULD BE RAISED ABOVE TSLRIC, DOES ECONOMIC THEORY PROVIDE ANY GUIDANCE CONCERNING WHICH PRICES SHOULD BE RAISED?

A. If other financial or policy considerations dictate that some subset of the ILEC's prices be raised above its costs as measured by TSLRIC, fundamental economic principles require that retail prices be raised, not those prices charged to and disproportionately borne by new entrants. Increasing intermediate product prices for competitors above efficient levels creates distortions in downstream production processes which must ultimately be borne by consumers, no matter which carrier they may choose for their retail service.[xv/] As a result, it is more economically efficient to recover any revenue shortfall from final consumers directly in the prices they pay for retail services. Such a recovery mechanism is competitively neutral, as the Act intends.

To the extent prices new entrants pay for unbundled network elements and network interconnection are raised above TSLRIC -- in order to generate revenues to achieve some other objective (e.g., to provide an additive for some recovery of embedded costs found to be "just and reasonable" or to pay for universal service subsidies) -- we are effectively sacrificing competition on the altar of this alternative goal. Such a sacrifice is unnecessary, because there are alternative, more efficient means of raising those revenues. This general policy prescription holds all the more strongly in the local exchange markets today, where public policy is attempting to facilitate a rapid transition from monopoly to competitive supply. Therefore, there is simply no principled basis for raising interconnection services and unbundled network elements prices above TSLRIC.

Q. TO BE CLEAR, IS IT YOUR POSITION THAT FINANCIAL VIABILITY CONSIDERATIONS DO NOT PROVIDE AN ECONOMICALLY RATIONAL JUSTIFICATION FOR INCREASING THE PRICES OF ILEC-SUPPLIED INPUTS ABOVE THEIR RESPECTIVE TSLRICS?

A. That is correct. In order to understand this issue more clearly, it is useful to pose the following three questions:

1. If ILEC-supplied monopoly inputs are priced at TSLRIC will the ILEC's costs exceed its revenues?
2. If TSLRIC prices for ILEC-supplied monopoly 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?
3. If TSLRIC prices for ILEC-supplied monopoly 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?

I answer each of these questions below.

Q. WOULD THE ILEC'S COSTS BE LIKELY TO EXCEED ITS REVENUES IF ILEC-SUPPLIED MONOPOLY INPUTS ARE PRICED AT TSLRIC?

A. Two considerations suggest that the answer to this question is "perhaps but probably not."

First, I am not proposing that all of the ILEC's revenue-generating services be priced at TSLRIC-- only those interconnection services and unbundled elements that are subject to monopoly power and must be purchased by competitors 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 an overall revenue shortfall.

Second, unless there are substantial common costs present in the ILEC's operations, TSLRIC prices will be fully compensatory. Some recent evidence suggests that the magnitude of common costs in this industry has been greatly exaggerated.[xvi/] If that is the case, then implementing TSLRIC prices for interconnection services and unbundled network elements will not create a revenue shortfall. Therefore, the answer to question 1 is clearly not an unambiguous "yes" -- it may, in fact, be "no."

Q. SHOULD THIS COMMISSION ENSURE THAT GTE IS MADE WHOLE IF ITS TSLRIC PRICES TO NEW ENTRANTS GENERATE A REVENUE SHORTFALL?

A. I am convinced that the theoretically correct answer here is "probably not" or, at least, "GTE should not be fully compensated." Several reasons underlie this opinion. First, the traditional regulatory compact, as interpreted in the landmark Hope Natural Gas case, never promised (or could promise) normal profits under all circumstances.[xvii/] Firms do not go bankrupt overnight, and many firms (both regulated and unregulated) have weathered prolonged periods of losses without exiting their industries. Thus, a regulatory policy that requires that the ILECs' profits be positive in every period would not appear to be economically optimal. Second, whatever regulatory compact might have existed under rate-based, rate-of-return regulation would appear to have been voluntarily repealed when Florida shifted to price-cap regulation for GTE. A principal feature of this alternative regulatory regime is supposed to be that the firm's stockholders willingly accept increased risks of both financial gains and losses.

Regulatory commissions simply cannot simultaneously continue to hold the ILECs harmless from competitive risk and promote any sort of meaningful competition in local exchange markets. Protection of competitors is fundamentally incompatible with promotion of competition as required by the Act and as planned for the benefit of Florida local telephone customers. As local exchange markets begin to evolve toward competition, ILEC appeals to be made whole (particularly at the expense of their competitors) should be increasingly ignored.

Q. IF THIS COMMISSION DETERMINES GTE IS ENTITLED TO RECOVER SOME PORTION OF AN ESTIMATED REVENUE SHORTFALL, HOW SHOULD THE RECOVERY BE ACCOMPLISHED?

A. If it is decided 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, the theoretically correct answer to this question again leads us 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. In short, under no circumstances does the financial viability issue warrant a departure from economically efficient TSLRIC prices.

Q. PRICING INTERCONNECTION SERVICES AND UNBUNDLED NETWORK ELEMENTS AT TSLRIC OBVIOUSLY REQUIRES EMPIRICAL ESTIMATES OF THESE COSTS. ARE SUCH ESTIMATES CURRENTLY AVAILABLE?

A. Yes. 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.

Specifically, any model used should generate cost estimates that: (1) are forward looking; (2) employ least-cost but currently available technologies; (3) measure incremental costs; (4) are long-run; and (5) are consistent with cost causation. The model described in AT&T Witness Wood's testimony appears to provide such a methodology.[xviii]

IV. THE PRICING OF WHOLESALE SERVICES

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

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 platform approach provides a source of market discipline that can help to prevent or overcome anti-competitive abuses that may arise from mispricing of other ILEC services (e.g., wholesale services and carrier access services). Specifically, 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.[xix/]

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 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 former pricing problem must incorporate the retail rate charged for the end-user service, whereas the latter 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 ACT?

A. Yes. The 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 the service at the wholesale stage versus the retail stage. Specifically, Section 252(d)(3) provides that:

> "A State commission shall determine wholesale rates on the basis of retail rates 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."

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 reducing or eliminating the ILEC's retail stage operations.

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

A. Under an appropriate definition of the "costs that will be avoided," under the Act, 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).[xx/]

The first component consists of the costs avoided by an economically efficient supplier of retail services that is minimizing cost and earning a normal profit (i.e., a

competitive return). A normal profit or competitive return is the investors' risk-adjusted return on capital investments, measured by opportunities presented in alternative enterprises. It is the very same return a new entrant would expect to earn.

The second and third components of avoided costs (fat and excess profits) are arguably the most avoidable of all avoided costs. If the ILEC no longer 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. I 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, pro-competitive) outcomes.[xxi/] Moreover, this rule is consistent with Section 252(d)(3).

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. Regardless of the efficiency of the retail price, however, it is economically efficient to apply the avoided cost pricing rule. Three

simple cases help to explain this point.

Case 1: An Efficient ILEC With No Excess Profit: In this case, the price the ILEC charges for the retail service is equal to the costs the ILEC incurs in providing this service. In other words, the ILEC experiences competitive profits in selling this service. In this case, the 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 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 this service is economically efficient (i.e., its operations contain no fat) and it is earning a normal (competitive) 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, 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.[xxii/]

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 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. Any potential entrant that incurs retailing costs greater than the ILEC is discouraged from entering.

Case 2: An Inefficient ILEC With Excess Profits: 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 profit (i.e., profits exceeding the ILEC's opportunity cost of its investment.). For example, suppose that, in addition to the $5 TSLRIC at the retail stage, the ILEC incurs an additional $2 in production inefficiencies at the retail stage 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. 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. 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.[xxiii/]

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 $16 minus the retail stage TSLRIC of $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.

Case 3: An Efficient ILEC and ILEC Revenues Below TSLRIC Costs:

Suppose a third case, 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 or price. Quite simply, an efficient discount applied to an ILEC's inefficient price yields another inefficient price. Importantly, however, application of the avoided cost pricing rule in this case still 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).[xxiv/] Here, however, we assume the ILEC earns negative profits of $2 per month on each unit of the service provided. 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.[xxv/]

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 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. 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. Any potential entrant whose incremental costs exceed $5 cannot profitably enter. 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 THIRD 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, 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 routine 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 NEW 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

25 l(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 or to any subsidiary, affiliate, or any other party to which the carrier provides interconnections."

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 anti-competitive end achievable through manipulation of input and/or output prices can also be achieved through some sort of non-price strategy.[xxvi/] 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.[xxvii/] 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. AS WITH TSLRIC PRICING OF INPUTS, IMPLEMENTATION OF THE AVOIDED COST PRICING RULE REQUIRES EMPIRICAL ESTIMATES OF THE RELEVANT COSTS--HERE, THE AVOIDED COSTS. ARE SUCH COST ESTIMATES AVAILABLE?

A. In an effort to calculate the ILECs' "costs that will be avoided" as a consequence of providing services at wholesale rather than retail, AT&T has developed a retail cost model. This model is described in more detail in AT&T Witness. Art Lerma's testimony. The purpose of the model is to account properly for the retail-level costs that will be avoided in the long run as an ILEC adjusts its operations to provide wholesale services. The model estimates the costs that are incurred (or not) as a consequence of participation at the retail level. The cost estimations provided by the model represent a sound approximation to the theoretically proper standard for establishing a discount that is dictated by the avoided cost pricing rule.

V. NON-PRICE COMPETITIVE ISSUES

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

A. As noted above, successful resolution of pricing issues will be in vain unless myriad other non-price terms of sale are also made conducive to entry. Neither resellers of wholesale services 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.

In fact, in situations where input prices have been set at competitive levels, the incentive to discriminate on non-price terms is heightened. Through provision of

inferior or untimely interconnection and provisioning services. ILECs can sustain their extant monopoly power against the threat of entry. Consequently, the Florida Commission needs to devote at least as much attention to non-price competitive issues as it does to the pricing issues discussed above.

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 be easily 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.[xxviii/]

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.[xxix/] For example, an ILEC may require competitors to interconnect at a particular point or adopt a specific interconnection arrangement that prevents 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. 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 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. 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 voluntarily negotiate contracts that facilitate entry into its own market.[xxx/] Under normal competitive contracting, both parties to the negotiation have something to gain. 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.

As a result, the Florida Commission must recognize that: (1) GTE has a strong economic incentive to exclude competitors from its market; and (2) such exclusion may be accomplished by [a] refusal to provide interconnection or other inputs needed for successful entry, [b] establishment of non-competitive prices for such

inputs, [c] provision of inferior interconnection, provisioning, or other inputs, and [d] refusal to negotiate contractual provisions reasonably required by new entrants. Close attention must be devoted to all sources of exclusionary effects if competition in local exchange markets is to develop.

Q. CAN YOU PROVIDE A HYPOTHETICAL EXAMPLE TO EXPLAIN THE ECONOMIC EQUIVALENCE OF THE ALTERNATIVE EXCLUSIONARY STRATEGIES YOU HAVE IDENTIFIED?

A. Yes. Suppose a firm is considering entry into a local exchange market. Such entry requires that firm to obtain interconnection service from the ILEC in order to terminate its customers' calls within the local calling area. The ILEC, in turn, has an economic incentive to foreclose such entry in order to maintain its monopoly position. Such foreclosure may be achieved through any of the four alternative strategies identified below.

First, the ILEC may simply refuse to provide the necessary interconnection service. Because local exchange entry cannot succeed without interconnection to the local network, such a refusal to deal obviously will prevent entry at the retail stage from occurring.

Second, the ILEC may agree to supply the interconnection service but set the price of that service at a prohibitively high level. By setting the interconnection rate in excess of the TSLRIC of providing the interconnection service, a vertical price-cost squeeze can be created that will prevent entry from occurring.

Third, suppose that, in conformity with the requirements of the Telecommunications Act, the ILEC agrees to provide the interconnection service and that regulators set the price of that service equal to its TSLRIC. The same exclusionary effect may still be achieved by providing entrants technically inferior interconnection arrangements, late delivery of promised services or other non-price deficiencies. These actions would raise new entrants' costs by preventing them from making efficient use of their networks. Again, these increased costs have the effect of foreclosing entry.

Finally, suppose the ILEC is required to provide fully equal interconnection at TSLRIC prices. Does this exhaust the avenues through which exclusion of competitors may be achieved? No. Even with equal interconnection provided at efficient prices, entrants can be prevented from entering the market by refusing to provide contractual terms that will make entry commercially feasible. For example, the ILEC may require a long-term commitment that the entrant is unwilling to make. It may refuse to provide quality commitments or penalty clauses that the entrant needs to reduce its risks of nonperformance by the ILEC. By presenting unacceptable contractual provisions and/or by refusing to supply needed provisions, the ILEC can increase the risks (and, therefore, the costs) of entering the market.

All four strategies have economically equivalent effects. They all can be used to exclude competitors from local exchange markets. The Commission will need to be alert to all four sources of exclusionary effects during the course of the arbitration process.

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 (non-discriminatory) interconnection provisions of the Act and institute explicit penalties for failure to perform (including the additional wholesale discount discussed above); 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 I 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.

Q. HAVE YOU HAD AN OPPORTUNITY TO REVIEW THE AUGUST 8TH FCC ORDER INTERPRETING SECTIONS 251 AND 252 OF THE ACT?

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 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.

VI. 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, state commissions should take their arbitration responsibilities very seriously and should adopt policy

decisions that will move these markets toward competition as expeditiously as possible.

My testimony presents the basic economic principles and specific pricing and provisioning recommendations that will achieve this objective. Specifically, the Florida 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) arbitrate equal interconnection and provisioning arrangements and truly non-discriminatory contractual provisions that recognize the different needs of the various companies attempting to enter these markets. And, when in doubt, err on the side of competition.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

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i/ Analogies may be seen in other industries: One example would be the appliance industry: A number of appliance retail stores may sell to Florida consumers the same national brands of refrigerators and other domestic appliances. Although the same products are marketed by each retail store, the consumer may see each store very differently -- based on the retail prices offered, variety and currency of products arrayed on the outlet floor, hours of operation and attentiveness by sales representatives to customers. Competition will produce distinguishable services, even if the basic product is the same.

ii/ Quality of service problems can be expected to become more prevalent under a price cap regime. Quite simply, under price caps, firms profit from cost reductions, and such reductions often may be achieved through the provision of lower quality services. See Timothy J. Brennan, "Regulating by Capping Prices,", Vol. 1 (June 1989), pp. 133-147.

iii/ Marginal cost, long-run incremental cost (LRIC), and total service long-run incremental cost (TSLRIC) all measure the change in the firm's total costs caused by a change in output. In that sense, they are very similar conceptually. The only difference

between them is the magnitude of the change in output contemplated. For marginal cost, the change is infinitesimal. For TSLRIC, the change is the entire output of the service. And for LRIC, the change is finite but less than then the entire output.

iv/ This is one of the most fundamental propositions in economics. For example, Paul Samuelson and William Nordaus write that:

"Only when prices of goods are equal to marginal cost is the economy squeezing from its scarce resources and limited technical knowledge the maximum of outputs." Paul A. Samuelson and William D. Nordaus, Economics. Twelfth edition, McGraw Hill Book Company, 1985, pp. 487-488.

v/ For example, see the discussion in Peter Temin, "Cross-Subsidies in the Telephone Network after Divestiture," Journal of Regulatory Economics, Vol. 2 (December 1990), pp. 349-362.

vi/ On the widespread use of cross-subsidization in regulated pricing structures, see Sam Peltzman, "Toward a More General Theory of Regulation." Journal of Law and Economics, Vol. 19 (August 1976), pp. 21 1-240. For an explanation of the popularity of such pricing structures among regulators, see T. Randolph Beard and Henry Thompson, "Efficient versus 'Popular' Tariffs for Regulated Monopolies," Journal of Business, Vol. 69, No. 1 (January 1996), pp. 75-87.

vii/ For the purposes of my testimony, interconnection services include the switching, transport and termination of local calls originating on one local carriers' network and terminating on another carriers' network. Unbundled network elements refer to existing local network facilities controlled by the ILEC, such as the local loop, local switch, signal processing and transport functions, that are needed by the new entrant to provide local telephone services.

viii/ TSLRIC measures the total incremental cost incurred in the long run that is caused by the addition (or deletion) of a service or element from an existing set of services or elements. Technically, the prices are set equal to the TSLRIC (which is a total dollar amount) divided by the number of units to be sold, so that prices are stated as dollars per unit.

ix/ These reasons are discussed more fully in the Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig attached to the "Comments of AT&T Corp." in CC Docket No. 96-98, May 16, 1996.

x/ Other constraints, such as uniform prices and normal profits, may be imposed as well. Indeed, the well-known concept of Ramsey prices is derived from precisely this sort of constrained optimization problem. See William J. Baumol and David F. Bradford, "Optimal Departures From Marginal Cost Pricing," American Economic Review, Vol. 60 (June 1970), pp. 265-283.

xi/ The social welfare benefits of implementing prices that achieve this result are likely to dominate any benefits that might possibly be derived from a set of alternative prices that solve the more traditional optimization problem under assumed static monopoly conditions. Therefore, promoting competition is entirely consistent with maximization of social welfare.

xii/ Which is, of course, why input prices that exceed TSLRIC artificially reduce the speed at which local exchange markets are transformed from monopoly to competition.

xiii Common costs are those costs which are required to provide a group of services, but which do not vary with the quantity of the individual services produced. As such, they are not causally attributed to a particular service or the level of a service. Embedded costs (or stranded investments) reflect items for which costs have been incurred in the past and recorded in a firms' accounting records, but which are not caused by current or future

production of services.

xiv/ See Richard Shin and John S. Ying, "Unnatural Monopolies in Local Telephone," RAND Journal of Economics, Vol. 23 (Summer 1992), pp. 171-183.

xv/ Indeed, price mark-ups on interconnection services and unbundled elements have precisely the same economic consequence as the imposition of taxes on these intermediate inputs. But the distortionary effects associated with taxation of inputs are well-known. See Peter A. Diamond and James A. Mirrlees, "Optimal Taxation and Public Production I: Production Efficiency," American Economic Review, Vol. 61 (March 1971), pp. 8-27. On page 24 of this paper, these authors explain that:

> Therefore the optimal tax structure includes no intermediate good taxes, since these would prevent efficiency . . . . In the absence of profits, taxation of intermediate goods must be reflected in changes in final good prices. Therefore, the revenue could have been collected by final good taxation, causing no greater change in final good prices and avoiding production inefficiency.

xvi/ William Baumol, Janusz Ordover, and Robert Willig have recently written that:

> We understand that the portion of forward-looking costs that is unattributable to particular network elements is likely to be small. The aggregated categories of network elements generally comprise discrete physical facilities -- loop, switching, transport, and signaling. Economies of scope, or cost subadditivities, among these categories are likely to be minimal or nonexistent.

Supra, footnote 9.

xvii/ Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 601 (1944).

xviii Where appropriate ILEC-specific cost data are not available, the Hatfield Model is also a useful methodology for estimating TSLRIC.

xix/ I will discuss some of these exclusionary strategies below.

xx/ If economic profits are negative, the service is receiving a subsidy and this component should be set equal to zero. I will address this case in more detail below.

xxi/ By "efficient outcomes" I 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.

xxii/ 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, Jarusz Ordover, and Robert D. Willig, supra, Note 6. See also, the recent substantive critiques 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; and William B. Tye and Carlos Lapuerta, "The Economics of Pricing Network Interconnection; Theory and Application to the Market for Telecommunications in New Zealand," Yale Journal on Regulation, Volume 13 (Summer 1996), pp. 419-500.

xxiii/ 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, ibid.

xxiv/ Relaxation of this assumption would not alter the conclusions of this analysis.

xxv/ 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.

xxvi/ 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.

xxvii/ 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, F 1, 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.

xxviii/ It is important to note that, for a price-cost squeeze to be effective, the retail price need not be below the overall cost of providing the service as long as the input price is sufficiently above cost. Competitors will be foreclosed if the spread between the retail price and the input price falls short of the incremental cost of producing the retail portion of the overall service.

xxix/ See Salop and Scheffman, supra, Note 26.

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

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II. Education

August 1970 B.S., Economics, The University of Tennessee

March 1976 Ph.D., Economics, The University of Florida

Fields: Industrial Organization, International Trade, Econometrics

Dissertation: "An Economic Analysis of the Home Mortgage Default Insurance Market"

III. Employment

Torchmark Professor of Economics, Auburn University, Auburn, AL 1988-present.

Professor and Head of Economics, Auburn University, Auburn, AL 1987-1988

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Associate Professor of Economics, University of Tennessee, Knoxville, TN, 1983-1986

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Economist, Energy Division, Oak Ridge National Laboratory, Oak Ridge, TN, 1977-1979

Economist, Bureau of Economics, Federal Trade Commission, Washington, D.C., 1976-1977

Economist, Office of Policy Development and Research, U.S. Department of Housing and Urban Development, Washington, D.C., 1974-1976

IV. Research Interests

Applied Microeconomics, Industrial Organization, Antitrust, Regulation

V. Grants and Awards

Auburn Utility Research Center Grant, Auburn University, Summer, 1992.

Auburn Utility Research Center Grant, Auburn University, Summer, 1990.

College of Business Outstanding Faculty Research Award, Auburn University, 1990.

Department of Economics Research Grant, Auburn University, Summer, 1989.

College of Business Faculty Research Grant, University of Tennessee, Summer, 1985.

College of Business Outstanding Research Award, University of Tennessee, 1984.

Beta Gamma Sigma Distinguished Faculty Member and Honorary Initiate, 1984.

College of Business Faculty Research Grant, University of Tennessee, Summer, 1984.

Bid Price, Ask Price, and Time on the Market: A Search Model of Housing Prices, funded by the U.S. Department of Housing and Urban Development, Summer - Fall, 1983.

College of Business Faculty Research Grant, University of Tennessee, Summer, 1983.

Participant in Emory University Law and Economics Center's "Legal Analysis for Economists" clinic held at Dartmouth University, New Hampshire, Summer, 1983.

An Economic Analysis of the Automatic Fuel Adjustment Clause, funded by Resources for the Future, Fall - Summer, 1982.

College of Business Outstanding Research Award, University of Tennessee, 1981.

College of Business Faculty Research Grant, University of Tennessee, Summer, 1981.

The University of Tennessee Faculty Research Grant, Summer, 1980.

VI. Publications

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"The Economics and Ethics of Organ Markets" (with Andy H. Barnett and Roger D. Blair), Society, forthcoming.

"Deregulation and Predation in Long-Distance Telecommunications: An Empirical Test" (with Simran K. Kahai and John W. Mayo), Antitrust Bulletin, Vol. 40 (Fall 1995), pp. 645-666.

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"The Shortage of Organs for Transplantation: Exploring the Alternatives (with A. H. Barnett), Issues in Law and Medicine, Vol. 9 (Fall 1993), pp. 117-137.

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Reviewed Managing Business Transactions: Controlling the Cost of Coordinating, Communicating, and Decision Making, Paul H. Rubin (New York: The Free Press, 1990), Journal of Economic Literature, Vol. 30 (June 1992), pp. 900-901.

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Reviewed Private Antitrust Litigation: New Evidence, New Learning, Lawrence J. White, ed. (Cambridge, MA: MIT Press, 1988) Journal of Economic Literature, Vol. 29 (June 1991), pp 636-638.

Reviewed The Antitrust Revolution, John E. Kwoka and Lawrence J. White, eds. (Glenview, IL: Scott, Foresman/Little Brown, 1989) Review of Industrial Organization, Vol. 4 (Fall 1989), pp. 143-146.

Reviewed New Developments in the Analysis of Market Structure, Joseph E. Stiglitz and G. Frank Mathewson, eds. (Cambridge, Mass.: The MIT Press, 1986) Antitrust Bulletin, Vol. 34 (Summer 1989), pp. 429-435.

Edited special memorial issue of the Survey of Business, Vol. 20 (Summer 1984) entitled "Industrial Organization and Antitrust Policy," in honor of Professor P. David Qualls.

Reviewed Economic Regulation: Essays in Honor of James R. Nelson, Kenneth D. Boyer and William G. Shepherd, eds. (East Lansing: MSU Public Utilities Paper, 1981) Southern Economic Journal, Vol. 49 (April 1983), pp. 1197-1198.

"Electricity Demand Modelling as an Input to NRC Licensing Decisions" (with James Van Dyke), Energy Modelling II: The Interface Between Model Builder and Decision Maker Symposium Papers, Institute of Gas Technology, June 1980.

"The Relative Quality of Graduate Programs: A More Balanced Econometric Approach" (with Jerry R. Jackson), American Statistical Association Proceedings of the Business and Economic Statistics Section, American Statistical Association, Washington, D.C., 1974.

"The Forward Exchange Rate: Its Determination and Behavior as a Predictor of the Future Spot Rate," American Statistical Association Proceedings of the Business and Economic Statistics Section, American Statistical Association, Washington, D.C., 1974.

VII. Papers in Progress

"Modeling Entry and Barriers to Entry: A Test of Alternative Specifications" (with Mark L. Burton and John W. Mayo).

"A Dynamic Model of Advertising by the Regulated Firm" (with John W. Mayo and Francois Melese).

"Open Entry and Local Telephone Rates: The Economics of IntraLATA Toll Competition" (with John W. Mayo, Larry R. Blank, and Simran Kahai).

"Dominant Firm Pricing with Competitive Entry and Regulation The Case of IntraLATA Toll" (with Larry R. Blank and John W. Mayo).

"Regulatory Policies Toward Local Exchange Companies Under Emerging Competition: Guardrails or Speedbumps on the Information Highway?" (with John W. Mayo).

"Vertical Integration to Raise Rivals' Costs" (with T. Randolph Beard and John W. Mayo).

"A Note on the Symmetry of Vertical Price and Output Restraints: The Missing Link."

"The Economic Theory of Regulation: A Graphical Exposition" (with Richard W. Ault and John W. Mayo).

"Targeted and Untargeted Subsidy Schemes: Evidence from Post-Divestiture Efforts to Promote Universal Telephone Service" (with Ross Eriksson and John W. Mayo).

"Ownership Structure and the Quality of Medical Care: Evidence from the Dialysis Industry" (with Jon M. Ford).

"Dialysis Treatment Modality and the Quality of Life: Evidence from Suicide Rates" (with Jon M. Ford).

VIII. Testimony

In Re: Petition of AT&T Communications of the South Central States, Inc. for Exemption of Services Pursuant to T.C.A. § 65-5-209(b), Docket No. 96-0650, Before the Tennessee Public Service Commission, May, 1996.

In Re: U S West Communications, Inc., Docket No. RPU-95-11, Before the Department of Commerce Utilities Board, State of Iowa, March, 1996.

In Re: An Inquiry into Local Competition, Universal Service, and the Non-Traffic Sensitive Access Rate, Administrative Case No. 355, Before the Kentucky Public Service Commission, February, 1996.

In the Matter of Application of GTE South Incorporated for, and Election of, Price Regulation, Docket No. P-19, SUB 277, Before the North Carolina Utilities Commission, February, 1996.

In the Matter of Petition of Carolina Telephone and Telegraph Company and Central Telephone Company for Approval of Price Regulation Plan Pursuant to G.S. 62-133.5, Docket Nos. P-7, SUB 825, and P-10, SUB 479, Before the North Carolina Utilities Commission, January, 1996.

In the Matter of Application of BellSouth Telecommunications, Inc. for, and Election of, Price Regulation, Docket No. P-55, SUB 1013, Before the North Carolina Utilities Commission, January, 1996.

In Re: AT&T Communications of Illinois, Inc.'s Petition for a Total Local Exchange Wholesale Service Tariff from Illinois Bell Telephone Company d/b/a Ameritech Illinois and Central Telephone Company Pursuant to Section 13-505.5 of the Illinois Public Utilities Act, Docket Nos. 95-0458 and 95-0531, Before the Illinois Commerce Commission, December, 1995.

In Re: U S West Communications, Inc., Docket No. RPU-95-10, Before the Department of Commerce Utilities Board, State of Iowa, November, 1995.

Application of BellSouth Telecommunications, Inc., D/B/A South Central Bell Telephone Company for a Price Regulation Plan, Docket No. 95-02614, Before the Tennessee Public Service Commission, November, 1995.

Request of AT&T of the Southern States for Approval of an Alternative Regulation Plan for Certain Services, Docket No. 95-661-C, Before the Public Service Commission of South Carolina, June, 1995.

Order of the Mississippi Public Service Commission Establishing an Inquiry into Whether Regulation of South Central Bell Should Be Changed from Incentive Regulation to Price Regulation and Related Issues, Docket No. 94-UA-536, Before the Mississippi Public Service Commission, May, 1995.

Investigation Into IntraLATA Interconnection Arrangements (Presubscription), Docket No. I-00940034, Before the Pennsylvania Public Utility Commission, March, 1995.

Ex Parte Presentation to the Staff of the Federal Communications Commission Regarding Competitiveness of the Long-Distance Market, March, 1995.

Application of Contel of Virginia, Inc. D/B/A GTE Virginia to Implement Community Calling Plans in Various GTE Virginia Exchanges Within the Richmond and Lynchburg LATAs, Case No. PUC930035, Before the Virginia State Corporation Commission, October, 1994.

City of Tuscaloosa, et al. vs. Harcros Chemicals, Inc., et al., Case No. CV-92-G-1614-S, Northern District of Alabama. Retained by three of the defendants in a bid-rigging case in the repackaged chlorine industry. Deposition taken in August, 1994.

Ex-Parte: In the Matter of Investigating Telephone Regulatory Methods Pursuant to Virginia Code, Section 56-235.5, et cetera, Case No. PUC930036, Before the Virginia State Corporation Commission, March, 1994.

In the Matter of Investigation to Consider Whether Competitive Intrastate Offerings of Long Distance Telephone Service Should be Allowed in North Carolina and What Rules and Regulations Should be Applicable to Such Competition if Authorized, Docket No. P-100, SUB 72, Before the North Carolina Utilities Commission, July, 1993.

Tariff Filing by South Central Bell Telephone Company for Presumptively Valid Regulation for New Optional Services and for Rate Reductions in Existing Services (Tariff 93-039), Docket No. 93-03038, Before the Tennessee Public Service Commission, April, 1993

Petition of AT&T of the South Central States, Inc. for Reduced Regulation of Intrastate Telecommunications Services, Case No. 92-297, Before the Public Service Commission, Commonwealth of Kentucky, January, 1993.

Order of the Mississippi Public Service Commission Initiating Hearings Concerning (1) IntraLATA Competition in the Telecommunication Industry and (2) Payment of Compensation by Interexchange Telecommunication Carriers and Resellers to Local Exchange Companies in Addition to Access Charges, Docket No. 90-UA-0280, Before the Mississippi Public Service Commission, May, 1991.

AT&T Communications of the South Central States, Inc.–Application for Limited IntraLATA Telecommunications Certificate of Public Convenience and Necessity, Docket No. 89-11065, Before the Tennessee Public Service Commission, March, 1991.

Inquiry of the General Counsel into the Reasonableness of the Rates and Services of Southwestern Bell Telephone Company, Docket No. 8585, Public Utility Commission of Texas, March-April, 1990.

In the Matter of the Application of AT&T Communications of the Southwest, Inc., to Institute Flexible Price Cap Regulation of Its Intrastate Services, Docket No. 167, 493-U, 90-AT&T-19-R, Before the State Corporation Commission of the State of Kansas, February, 1990.

In the Matter of: An Inquiry into IntraLATA Toll Competition and Appropriate Compensation Scheme for Completion of IntraLATA Calls by Interexchange Carriers and WATS Jurisdictionality, Administrative Case No. 323, Phase I, Before the Public Service Commission, Commonwealth of Kentucky, February, 1990.

In Re: Investigation of the Revenue Requirements, Rate Structures, Charges, Services, Rate of Return and Construction Program of AT&T Communications of the South Central States, Inc. in its Louisiana Intrastate Operations, Appropriate Level of Access Charges and All Matters Relevant to the Rates and Services Rendered by the Company, Docket No. U-17970, Before the Louisiana Public Service Commission, June, 1989.

In the Matter of the Investigation for the Purpose of Determining the Classification of the Services Provided by Interexchange Telecommunications Companies within the State of Missouri,

Case No. TO-88-142, Before the Public Service Commission of the State of Missouri, February, 1989.

In the Matter of the Petition of the General Counsel for an Evidentiary Proceeding to Determine Market Dominance Among Interexchange Telecommunications Carriers, Docket No. 7790, Before the Public Utility Commission of Texas, June 1988.

In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers, Docket I.87-11-033, Before the Public Utilities Commission of the State of California, January 1988.

The Review of Private Line Services, Case No. 6633, Before the Public Utilities Commission of the State of Colorado, September, 1987.

Testified before the Texas State Legislature (committees in both the House and the Senate) concerning appropriate regulatory policy in the post divestiture long-distance telecommunications industry, March, 1987.

In the Matter of the Petition of AT&T Communications of the Pacific Northwest, Inc. for Classification as a Competitive Telecommunications Company, Cause No. U-86-113, Before the Washington Utilities and Transportation Commission, November, 1986.

Performed a complete damage study for the City of Chattanooga in a bid-rigging case in the sewer construction industry. Testified by deposition, July, 1986.

Testified by affidavit in Federal Court in Columbus, Georgia, on behalf of Royal Crown Cola. Temporary restraining order hearing against the Coca- Cola/Dr. Pepper and the Pepsico/7-Up mergers.

In the Matter of Occidental Petroleum Corporation and Tenneco Plastics Corporation (Merger Case-Preliminary Injunction Hearing in Federal District Court, Washington, D.C.), March 1986.

Petition of General Counsel for Initiation of an Evidentiary Proceeding to Establish Telecommunications Submarkets, Docket No. 6264, Before the Public Utility Commission of Texas, September, 1985.

In the Matter of an Investigation of Intrastate Separations, Settlements and Intrastate Toll Rate of Return, Docket No. 83-042-U, Before the Arkansas Public Service Commission, April, 1985.

United States of America Before Federal Trade Commission in the Matter of the B.F. Goodrich Company, Diamond Shamrock Chemicals Company, and Diamond Shamrock Plastics Corporation (Merger Case), January, 1985.

Regulation of Interexchange Carriers, Docket No. 127, 140-U (Phase IV), Before the Corporation Commission of the State of Kansas, October, 1984.