BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

IN RE: PETITION FOR EXPEDITED REVIEW AND CANCELLATION OF BELLSOUTH TELECOMMUNICATIONS, INC.'S KEY CUSTOMER PROMOTIONAL TARIFFS AND FOR INVESTIGATION OF BELLSOUTH'S PROMOTIONAL PRICING AND MARKETING PRACTICES, BY FLORIDA DIGITAL NETWORK, INC.	)	DOCKET NO. 020119-TP
IN RE: PETITION FOR EXPEDITED REVIEW AND CANCELLATION OF BELLSOUTH TELECOMMUNICATIONS, INC.'S KEY CUSTOMER PROMOTIONAL TARIFFS BY FLORIDA COMPETITIVE CARRIERS ASSOCIATION	)	DOCKET NO. 020578-TP

DIRECT TESTIMONY

OF

WILLIAM E. TAYLOR, Ph.D.

ON BEHALF OF

BELLSOUTH TELECOMMUNICATIONS, INC.

OCTOBER 23, 2002

n/e/r/a
Consulting Economists

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OCTOBER 23, 2002

1 ## I. INTRODUCTION

2 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT**
3 **POSITION.**

4 A. My name is William E. Taylor. I am Senior Vice President of National Economic Research
5 Associates, Inc. ("NERA"), head of its Communications Practice, and head of its Cambridge
6 office located at One Main Street, Cambridge, Massachusetts 02142.

7 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL, PROFESSIONAL, AND BUSINESS**
8 **EXPERIENCE.**

9 A. I have been an economist for over twenty-five years. I earned a Bachelor of Arts degree from
10 Harvard College in 1968, a Master of Arts degree in Statistics from the University of California at
11 Berkeley in 1970, and a Ph.D. from Berkeley in 1974, specializing in Industrial Organization and
12 Econometrics. For the past twenty-five years, I have taught and published research in the areas
13 of microeconomics, theoretical and applied econometrics, which is the study of statistical methods
14 applied to economic data, and telecommunications policy at academic and research institutions.
15 Specifically, I have taught at the Economics Departments of Cornell University, the Catholic
16 University of Louvain in Belgium, and the Massachusetts Institute of Technology. I have also

1 conducted research at Bell Laboratories and Bell Communications Research, Inc. I have
2 participated in telecommunications regulatory proceedings before several state public service
3 commissions, including the Florida Public Service Commission ("Commission") in Docket Nos.
4 900633-TL, 920260-TL, 920385-TL, 960786-TP, 980000-SP, 980696-TP, 990750-TP,
5 000075-TP, and 000121-TP.

6 I have also filed testimony before the Federal Communications Commission ("FCC") and
7 the Canadian Radio-television Telecommunications Commission on matters concerning incentive
8 regulation, price cap regulation, productivity, access charges, local competition, interLATA
9 competition, interconnection and pricing for economic efficiency. Recently, I was chosen by the
10 Mexican Federal Telecommunications Commission and Telefonos de Mexico ("Telmex") to
11 arbitrate the renewal of the Telmex price cap plan in Mexico.

12 I have also testified on market power and antitrust issues in federal court. In recent
13 years, I have studied—and testified on—the competitive effects of mergers among major
14 telecommunications firms and of vertical integration and interconnection of telecommunications
15 networks.

16 Finally, I have appeared as a telecommunications commentator on PBS Radio and on
17 The News Hour with Jim Lehrer. My curriculum vita is attached as Exhibit WET-1.

18 **Q. PLEASE DESCRIBE NERA, YOUR PLACE OF EMPLOYMENT.**

19 A. Founded in 1961, National Economic Research Associates or NERA is an internationally known
20 economic consulting firm. It specializes in devising economic solutions to problems involving

1 competition, regulation, finance, and public policy. Currently, NERA has more than 275
2 professionals (mostly highly experienced and credentialed economists) with 10 offices in the U.S.
3 and overseas offices in Europe (London, Brussels, and Madrid) and Sydney, Australia. In
4 addition, NERA has on staff several internationally renowned academic economists as Special
5 Consultants who provide their professional expertise and testimony when called upon.

6 The Communications Practice, of which I am the head, is a major part of NERA. For
7 over 30 years, it has advised a large number of communications firms both within and outside the
8 U.S. Those include the regional Bell companies and their subsidiaries, independent telephone
9 companies, long distance companies, cable companies, and telephone operations abroad (e.g.,
10 Canada, Mexico, Europe, Japan and East Asia, Australia, and South America). In addition, this
11 practice has provided testimony or other input to governmental entities such as the FCC, the
12 Department of Justice, the U.S. Congress, state regulatory commissions and legislatures, and
13 courts of law. Other clients include industry forums like the United States Telephone Association.
14 Last year, the NERA Communications Practice received the *International Business Leadership*
15 *Award* from the Center for International Business Education and Research at the University of
16 Florida, citing our work on incentive regulation, transfer pricing, technological convergence and
17 opening new markets to competition.

18 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

19 A. I have been asked by BellSouth Telecommunications, Inc. ("BellSouth")—an incumbent local
20 exchange carrier ("ILEC")—to address several economic issues raised for this proceeding by the

1 Florida Public Service Commission ("Commission") Order No. PSC-02-1295-PCO-TP, dated
2 September 23, 2002.

3 II. RESPONSE TO SELECTED COMMISSION ISSUES

4 **Q. WHAT CRITERIA, IF ANY, SHOULD BE ESTABLISHED TO DETERMINE**
5 **WHETHER THE PRICING OF A BELLSOUTH PROMOTIONAL TARIFF**
6 **OFFERING IS UNFAIR, ANTI-COMPETITIVE, OR DISCRIMINATORY? [ISSUE**
7 **2]**

8 A. From an economic standpoint, the *fairness* of a price is judged in two dimensions: (1) whether
9 the price is fair to competitors, and (2) whether the price is fair to customers. Although a price
10 would need to be fair on both counts, it is possible for any given price to satisfy one of these
11 requirements but not the other.

12 A price is fair to competitors as long as it is not anti-competitive. As discussed later,
13 Sections 364.051(5) and 364.3381 of the Florida Statutes provide protections against anti-
14 competitive pricing.

15 A price is fair to customers if it does not discriminate among customers that are similarly
16 situated. While price differentiation (or, in economic parlance, "price discrimination") can occur
17 even in workably competitive markets, and in fact such pricing can be efficient and promote
18 social welfare, the minimum requirement there is that customers being charged different prices
19 must be in different circumstances. I return to how customers may or may not be differently
20 situated later in my testimony.

1 Just like its regularly tariffed services, if BellSouth's promotional offerings are priced in
2 accordance with these two principles, then they will be fair to both competitors and customers.
3 However, while the application of those two principles would be *sufficient* to ensure that
4 promotional prices are acceptable, there may be circumstances in which promotional prices do
5 not, on the surface, meet the price floor test for fairness to competitors but can still be
6 procompetitive rather than anti-competitive. I return to these circumstances later in my testimony.

7 **Q. WHAT CRITERIA SHOULD BE ESTABLISHED TO DETERMINE WHETHER**
8 **THE PRICING OF A BELLSOUTH PROMOTIONAL TARIFF OFFERING IS**
9 **UNFAIR, ANTI-COMPETITIVE, OR DISCRIMINATORY, PURSUANT TO THE**
10 **COST STANDARD IDENTIFIED IN SECTIONS 364.051(5) AND 364.3381,**
11 **FLORIDA STATUTES. [ISSUE 2(i)]**

12 Section 364.051(5) contains two cost standards that pertain to the pricing of nonbasic services.
13 Section 364.051(5)(b) states the following cost standard for preventing cross-subsidy:

14 The cost standard for determining cross-subsidization is whether the total revenue
15 from a nonbasic service is less than the total long-run incremental cost of the service.
16 Total long-run incremental cost means service-specific volume and nonvolume-
17 sensitive costs.[1]

18 Section 364.051(5)(c) lays out a cost standard that (implicitly) address both predatory pricing
19 and a price squeeze.

20 The price charged to a consumer for a nonbasic service shall cover the direct costs of
21 providing the service and shall, to the extent a cost is not included in the direct cost,

[1] This measure of cost is also frequently called total *service* long-run incremental cost ("TSLRIC").

1 include as an imputed cost the price charged by the company to competitors for any
2 monopoly component used by a competitor in the provision of its same or functionally
3 equivalent service.

4 Section 364.3381(1)-(2) states the same cost standards as in Section 364.051(5) for the
5 prevention of cross-subsidy, while Section 364.3381(3) reserves to the Commission "continuing
6 oversight jurisdiction over cross-subsidization, predatory pricing, or other similar anti-competitive
7 behavior … ." While I am not an attorney, it is my understanding that Section 364.3381 applies
8 to local exchange telecommunications carriers that do not operate under price regulation, while
9 Section 364.051(5) applies specifically to BellSouth and other local exchange carriers operating
10 under the price regulation statute. Therefore, the latter section contains the cost standards for
11 preventing anti-competitive or discriminatory pricing that apply to BellSouth. I conclude that the
12 Florida Statutes provide all the protections necessary against unfair pricing (and, in particular,
13 anti-competitive promotional tariff offerings), and the Commission should apply the tests
14 contained therein to resolve the issues in dispute in this proceeding.

15 **Q. DO THE FLORIDA STATUTES SPECIFY OTHER FORMS OF ANTI-**
16 **COMPETITIVE PRICING AND PROVIDE FOR PROTECTIONS AGAINST**
17 **THEM?**

18 A. As noted above, Section 364.3381 refers to predatory pricing as a form of anti-competitive
19 behavior, but sets out no specific protection against it. Section 364.051(5)(c), on the other hand,
20 sets out the economic protection against predatory pricing and a price squeeze but doesn't name
21 these forms of anti-competitive pricing. From an economic standpoint, the price floor that

1 protects against predatory pricing generally is long run incremental cost ("LRIC"), although courts
2 of law have sometimes used the short run marginal cost (or the short run average variable cost) as
3 the price floor to test for the possibility of predatory pricing.[2] The economic price floor that
4 protects against a price squeeze augments the floor for predatory pricing by adding the
5 contribution (price less incremental cost) the competitor must pay for use of the incumbent's
6 essential facilities.

7 **Q. WHAT IS A PRICE SQUEEZE, AND HOW DOES THE COST STANDARD OF**
8 **SECTION 364.051(5)(C) PROTECT AGAINST IT?**

9 A. The opportunity for a price squeeze of competitors arises when a firm that competes at the retail
10 stage with other firms also controls an essential facility—a facility that competitors are unable to
11 practically or reasonably duplicate—that *all* firms need to produce the retail-stage service. The
12 price squeeze occurs when the firm that controls the essential facility (which its retail competitors
13 must buy from it) sets the price of that facility so high that it becomes an unbearable cost to its
14 competitors (i.e., leaves equally-efficient competitors unable to match its retail price without
15 incurring losses).

16 Section 364.051(5)(c) of the Florida Statutes identifies as a "monopoly component" the
17 essential facility that is used both by BellSouth to provide a nonbasic service and by its
18 competitors to provide a functionally equivalent service. It also seeks to prevent any price

[2] LRIC is approximately the long run analog of short run marginal cost. It is defined as the additional cost to the firm of providing the last unit of a service, once the firm has made the capacity adjustments to operate at the most efficient scale of operations.

1 squeeze by requiring BellSouth to impute the price of that essential facility into its cost to supply

2 the retail nonbasic service.[3]

3 **Q. ARE THERE ADDITIONAL PROTECTIONS FROM OUTSIDE THE FLORIDA**

4 **STATUTES THAT MAKE A PRICE SQUEEZE UNLIKELY?**

5 A. Yes. The imputation price floor that protects against a price squeeze is only needed when

6 competitors are obliged to buy an essential facility ("monopoly component") from BellSouth (or

7 any other source of that facility). If competitive alternatives exist for that facility, or if competitors

8 can procure it from other sources, then that facility ceases to be "essential" or a monopoly

9 component. In that event, the imputation price floor is no longer necessary, and price floors

10 needed to prevent other forms of anti-competitive pricing alone suffice.

11 One circumstance in which competitors are able to procure a facility without facing the

12 danger of a price squeeze is when BellSouth resells its retail service at an avoided cost discount.

13 As is evident from a passage in its recent Order authorizing BellSouth to enter interLATA long

14 distance markets in Georgia and Louisiana, the FCC evidently subscribes to this view.

15 Responding to AT&T's claim of a price squeeze when residential local exchange rates of Bell

16 Operating Companies ("BOCs") are set below a competitor's cost of providing the same service

17 by combining the necessary BOC-supplied UNEs, the FCC noted:

[3] From an economic perspective, the imputation price floor should be the sum of the direct incremental cost of the nonbasic service and the contribution margin (i.e., price less incremental cost) that BellSouth could earn from the nonbasic service. When BellSouth's cost to provide the essential facility to its competitors is the same as the cost to provide it to itself, this condition can be shown to be equivalent to that in Section 364.051(5)(c) of the Florida Statutes.

1 UNEs are priced from the "bottom up," that is beginning with a BOC's costs plus a
2 reasonable profit, whereas resale is priced from the "top down," that is, beginning with
3 a BOC's retail rate and deducting avoided costs. Such a distinction ensures that
4 resale provides a profit margin where, as is the case here, the costs of individual
5 elements exceed the retail rate. *Accordingly, we conclude that it is appropriate to*
6 *consider the effects of resale on whether a price squeeze exists such that*
7 *competitors are doomed to failure.*[4]

8 **Q. WHAT IS A CROSS-SUBSIDY, AND HOW DOES THE COST STANDARD OF**
9 **SECTION 364.051(5)(B) PROTECT AGAINST IT?**

10 A. In theory, a cross-subsidy is an anti-competitive anomaly which pertains to firms regulated under
11 traditional cost-of-service standards. For such firms, regulated service prices depend on
12 accounting costs allocated to the services. Any ability to shift accounting costs from a
13 competitive to a non-competitive service would permit the firm to price its competitive service at
14 a predatory level (below actual incremental cost) and make up for the losses involved by
15 increasing the prices of non-competitive services. Public Service Commissions frequently
16 consider such cross-subsidies to be anti-competitive because they permit the regulated firm to
17 undercut the prices of equally-efficient competitors and make up for any reduction in profits by
18 increasing prices for non-competitive services.

19 There are several reasons why cross-subsidization of nonbasic services is not a serious
20 real-world concern in Florida. First, regulatory concern with universal service has created prices
21 which, if they embody a subsidy at all, are much more likely to entail a subsidy flow from

[4] FCC, *In the Matter of Joint Application by BellSouth Corporation, BellSouth Telecommunications, Inc., and BellSouth Long Distance, Inc. for Provision of In-Region InterLATA Services in Georgia and Louisiana*, CC Docket No. 02-35, Memorandum Opinion and Order, released May 15, 2002, ¶287. Emphasis added.

1 nonbasic services to basic services, rather than the other way around. Second, a complete
2 accounting separation of non-competitive and competitive services makes it difficult for the firm to
3 shift costs in the manner described. Third, most forms of price cap regulation (like the one that
4 applies to BellSouth in Florida under Section 364.051 of the Florida Statutes) automatically
5 prevent cross-subsidization by (1) separating prices from accounting costs and (2) assigning non-
6 basic and basic services to separate baskets and applying different pricing rules. As a result,
7 service prices within each basket are governed solely by pricing rules specific to that basket, and
8 cannot be influenced by costs or prices in other baskets. Even if costs for nonbasic services
9 could be shifted into the basic services basket, such a change in costs would have no effect on the
10 price BellSouth could charge for basic services.

11 **Q. WHAT CRITERIA SHOULD BE ESTABLISHED TO DETERMINE WHETHER**
12 **THE PRICING OF A BELLSOUTH PROMOTIONAL TARIFF OFFERING IS**
13 **UNFAIR, ANTI-COMPETITIVE, OR DISCRIMINATORY, PURSUANT TO ANY**
14 **OTHER PROVISIONS OF CHAPTER 364, FLORIDA STATUTES? [ISSUE 2(ii)]**

15 A. The criteria listed above from the Florida Statutes are reasonably consistent with the economic
16 tests for anti-competitive pricing in the forms of predatory pricing, cross-subsidization and a price
17 squeeze. I discuss below criteria for determining whether a promotional tariff offering is
18 discriminatory. Finally, if a promotional tariff offering is not anti-competitive or discriminatory, it
19 is fair to both competitors and consumers.

20 **Q. UNDER WHAT CIRCUMSTANCES WOULD A PROMOTIONAL TARIFF**

1 **OFFERING BE CONSIDERED ANTI-COMPETITIVE?**

2 A. Promotional offerings, particularly those offering price discounts to specific sets of customers, are
3 sometimes alleged to be anti-competitive merely because the resulting prices are lower than they
4 would otherwise be. It is one thing for competitors to feel aggrieved by the incumbent firm's
5 promotional prices that are provably anti-competitive; it is quite another to object to those prices
6 simply because they strain the competitors' ability to offer matching prices and to earn the profit
7 margins that had been anticipated before the incumbent's promotional prices went into effect.

8 Generally, a promotion should be viewed as an offering of an existing or new service at a
9 discount and, therefore, a form of pricing flexibility. It is often temporary and designed typically
10 to (1) gain new customers, (2) win back customers lost to competitors, (3) retain customers, (4)
11 sell additional services, and (5) learn more about the market. Lowering a price temporarily to
12 some customers, or under certain conditions, does no harm to equally or more efficient
13 competitors if that price does not fall below the applicable cost-based price floor. Indeed, such
14 price reductions are the very essence of competition, and restrictions on any firm's ability to
15 undertake such forms of competition are likely to result in higher prices for consumers. As long
16 as the service being promoted is priced to satisfy the applicable price floor(s), the promotional
17 price associated with it is efficient and pro-competitive. In addition, as described below, some
18 promotional prices may appear to violate an applicable price floor and yet the offering, taken as a
19 whole, does not.

20 **Q. WHAT ARE THE ECONOMIC EFFECTS OF IMPLEMENTING A**

1 **PROMOTIONAL OFFERING?**

2 A. A promotional offering entails a price reduction for particular services (or packages of services)
3 and customers. Because BellSouth would recover at least some contribution from every
4 customer it serves under the promotion, its total contribution derived from the service (including
5 both discount and regular tariff customers) could be higher than in the absence of the promotion
6 where it would receive no contribution from those customers who would not have purchased
7 services from BellSouth but for the promotion. In such circumstances, the promotion would not
8 be anti-competitive because the price reduction would increase the firm's profits (compared with
9 no price reduction) and no service or package of services would be priced below its incremental
10 cost. Again, as noted next, there may be promotions that are procompetitive and yet may appear
11 to violate the applicable generic price floor. Care must be taken in assessing promotions to allow
12 common types of retail promotions that are procompetitive even though they may appear to
13 violate a price floor.

14 **Q. PLEASE EXPLAIN IN WHICH CIRCUMSTANCES THE PRICE FLOOR TESTS**
15 **MAY ONLY BE SUFFICIENT, BUT NOT NECESSARY, TO PROTECT AGAINST**
16 **ANTI-COMPETITIVE PRICING.**

17 A. As explained above, promotional offerings are designed, particularly in competitive markets, to
18 attain several different goals. In so doing, the returns to promotional offerings may accrue over
19 longer periods of time than the durations of those offerings. Thus, for example, a promotional
20 offering (at discounted prices) that is run for, say, 90 days may not reasonably be expected to

1 produce a revenue effect that is limited to that three-month period. Rather, customers who sign
2 up for the short-term promotional offering may continue to purchase the promoted service or
3 services at higher than promotional prices long after the promotion itself has been terminated.
4 This reflects a common marketing strategy in most competitive markets—that of securing a
5 customer's business over the long haul, using whatever short-term inducements may be
6 necessary. No profit-maximizing firm would ever consider pursuing such a strategy if it did not
7 prove profitable or at least compensatory (wherein revenues earned at least recover costs) over
8 the long haul. Thus, a promotional price that temporarily falls below the price floor (used in static
9 tests of anti-competitive conduct) need not be anti-competitive if, as a result of the promotion,
10 enough revenue is generated during the post-promotion period to recover the relevant costs.
11 Some specific circumstances in which this exception applies to the general rule for testing
12 anti-competitive pricing are as follows. First, a firm may determine through market research that
13 the probability of customer retention in the post-promotion period is reasonably high (i.e., better
14 than even odds). If the firm can then make a reasonable prediction about how long it could
15 continue to serve the customer with the promoted service, then it could also calculate the
16 expected revenue from the complete strategy of first promoting the service at a discounted price
17 and then selling it at a higher price once the promotion was terminated.[5] If that calculation shows
18 that expected revenue (which takes account of the statistical probability of customer retention) is
19 no less than the expected cost of serving the customer, then the firm would have met the burden

[5] A variation of this strategy is the common promotion in telecommunications of waiving one-time installation or
(continued...)

1 of demonstrating that its promotion and pricing strategy is not anti-competitive.

2 Second, this type of calculation would be more tractable with a slightly different
3 marketing strategy of first running a limited-duration promotion at a discounted price and then
4 signing up the customer for service over a fixed term. This is a variation on term discounts in that
5 all of the discounts are received up front subject to the customer's agreeing to purchase the
6 service for a predetermined length of time in the post-promotion period. The calculation of
7 expected revenue, and its comparison to expected cost, is even more straightforward in this
8 instance, and judging whether the entire marketing strategy results in fair prices is equally
9 uncomplicated.

10 A third situation where a more dynamic view of the price floor tests may be necessary is
11 when, in the process of running a promotion, a firm provides an additional product or service at
12 no extra charge. This strategy would be procompetitive in at least two circumstances. First,
13 suppose the forward-looking incremental cost of providing that product or service were
14 essentially zero. This could happen, for example, if a telephone company were to attempt to
15 develop goodwill from prospective customers by giving them older-generation telephone sets or
16 handsets at no extra charge. For all practical purposes, the forward-looking incremental costs of
17 those sets are zero. In this instance, bundling them with other services provided through the
18 promotional offering should not require a separate accounting for the revenues and costs of the

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(...continued)

start-up fees for new customers.

1 telephone sets or handsets. Second, including a free service with a package of other services is
2 not anticompetitive when the expected revenue from the entire package equals or exceeds its
3 incremental cost.

4 In general, competition in unregulated competitive markets is characterized by rapid,
5 clever, dynamic promotional campaigns of amazing and unpredictable variety. Such competition
6 is particular apparent in markets, like telecommunications services, where production entails high
7 fixed and low variable costs and simple price competition is a losing strategy. Perhaps the one
8 common thread these promotions have is that their sponsors expect each of them to make
9 money, and whenever those expectations are reasonable, the promotion is entirely
10 procompetitive. Sometimes those expectations are realized, and sometimes they are not.
11 Sometimes it is easy to show that a promotion will likely be profitable, and sometimes such
12 showings, involving expectations of future consumer behavior, will difficult. In any case, the
13 regulator must be careful to establish policies that encourage—and certainly not discourage—all
14 firms in the provision of such promotional activity.

15 **Q. IS THERE ANY OTHER REASON TO BELIEVE THAT COMPETITION WILL**
16 **NOT BE HARMED BY BELLSOUTH'S PRICE-DISCOUNTED PROMOTIONAL**
17 **OFFERINGS?**

18 A. Yes. Under the provisions of the Telecommunications Act of 1996 and this Commission's own
19 implementing rules, BellSouth is obligated to offer its long-term (greater than 90 day) promotional
20 offerings for resale by its competitors. Those competitors receive not only the discounts built into

1 BellSouth's long-term promotional offerings, but also the wholesale (avoided cost) discount for
2 which all competitors in Florida are eligible when they resell BellSouth's services. Thus,
3 promotional discounts that BellSouth finds sufficiently profitable to warrant longer than a 90 day
4 period become subject to increased competition when BellSouth's competitors can purchase
5 them for resale at the avoided-cost discount.

6 **Q. HOW SHOULD THE APPROPRIATE CRITERIA IDENTIFIED IN ISSUES 2(i) AND**
7 **2(ii) BE APPLIED TO A TARIFF UNDER WHICH VARYING CUSTOMER**
8 **CONFIGURATIONS ARE POSSIBLE? [ISSUE 2(iii)]**

9 A. In economic theory, the proper starting point for applying such criteria is the product or service
10 market in which the service or package of services is being sold. Offering "free" installation with
11 a new basic service order could not be considered anti-competitive simply because installation
12 was "priced" below its incremental cost. So long as the price of the package (installation plus
13 service) covers the incremental cost of the package, there should be no economic presumption of
14 anti-competitive pricing. Similarly, a package including free calling after midnight is not
15 necessarily anti-competitive, because post-midnight calling is not a standalone product market, as
16 economists define those markets.

17 In addition, no matter how narrowly the customer base for a product or service is
18 defined, competitive equity (or fairness) considerations only demand that the customers of a
19 product or service do not, *as a group*, either provide a cross-subsidy to (or receive a cross-

1 subsidy from) the customers of another product or service, again taken as a group.[6]

2 While varying customer configurations are certainly possible from a sales standpoint,
3 there is no *economic* reason for applying the competitive fairness tests to each such configuration.
4 Different customer configurations can arise from allowing customers to purchase services in
5 different combinations, with each constituent service priced differently in those combinations than
6 they would be on a stand-alone basis. However, no matter how those service combinations are
7 put together, what ultimately matters for competitive fairness is whether each service in the
8 aggregate passes the various price floor tests that may be applied, such as those envisioned by
9 Sections 364.051(5) and 364.3381 of the Florida Statutes.

10 The reason is that, as long as the service for which firms compete in the market is priced
11 appropriately, no competitor in the market is placed at a competitive disadvantage. Firms do not
12 generally offer identical packages of services, let alone compete in any product market consisting
13 of a single package. Rather, firms compete in access and usage service markets, and only if
14 offerings at a service level of aggregation fail a price floor test is there a reason to be concerned
15 about anti-competitive behavior. Even in the special case where the incumbent firm has control
16 over a specific input for that service that all competitors need (e.g., an essential facility), the extra
17 layer of protection called for—namely, the test against price squeeze described above—should
18 only apply to the retail price of the service, whether it is sold in packaged or standalone form.

19 **Q. IS THE BELLSOUTH KEY CUSTOMER TARIFF FILING (TARIFF NUMBER T-**

[6] See, e.g., William J. Baumol, *Superfairness: Applications and Theory*, Cambridge, MA: MIT Press, 1986, Ch. 6.

1 **020595 OR A SUBSEQUENT TARIFF FILING THAT EXTENDS THE EXPIRATION**
2 **DATE THEREOF) UNFAIR, ANTI-COMPETITIVE, OR DISCRIMINATORY**
3 **UNDER THE CRITERIA, IF ANY, ESTABLISHED PURSUANT TO ISSUES 2(i),**
4 **2(ii), AND 2(iii)? [ISSUE 2(v)]**
5 A. No. The operational criteria for judging competitive fairness that apply to the initial offering of the
6 BellSouth Key Customer plan should also apply to a subsequent version of that promotional
7 offering that results from extending the expiration date of the original offering. If any such
8 extension leads also to specific changes in the terms and conditions (including price) of the
9 promotional offering, then it is appropriate to re-conduct the tests of fairness on that subsequent
10 version. However, if the price that results under those changed terms and conditions satisfies the
11 criteria for competitive fairness, then the subsequent version of the Key Customer tariff offering
12 must be considered valid and acceptable under the Florida Statutes. Simply extending the
13 expiration date of a promotional offering has nothing *per se* to do with competitive fairness. It is
14 not unusual or anti-competitive for successive promotional campaigns to be run in unregulated or
15 competitive markets, even if those campaigns run consecutively and produce, in effect, one long
16 and continuous campaign. If BellSouth chooses to reduce prices for a service over a long period
17 in order to run successive promotional campaigns, it is a market calculation that BellSouth must
18 live by. As long as its prices are not anti-competitive and/or discriminatory in the process,
19 BellSouth should not be denied the opportunity to make that market calculation. Moreover,
20 consumers stand to benefit from the lower price of the promotional offering.
21 The imposition of any "cooling-off period," such as mandating a return to "regular"

1 service prices for some specified period of time before the next promotion is permitted is not
2 warranted by legitimate concerns about unfair pricing. If BellSouth's promotional prices pass the
3 competitive fairness tests, it would diminish competition and consumer welfare to require
4 BellSouth to stagger its promotions. On the other hand, if cooling-off periods are mandated,
5 customers would be denied the benefit of the lower promotional prices for the duration of those
6 periods, and competitors would be less compelled to compete on the basis of their efficiency and
7 powers of innovation relative to those of BellSouth. Moreover, mandatory cooling-off periods
8 imposed asymmetrically on BellSouth could leave its competitors with significant competitive
9 advantages. This would be especially so when the length and timing of the cooling-off periods are
10 known, or can be anticipated, in advance. Regulatory restraints on BellSouth in the absence of
11 evidence of anti-competitive or discriminatory behavior could only confer artificial competitive
12 advantages upon BellSouth's unregulated rivals, reducing social welfare in the process.

13 **Q. PURSUANT TO SECTION 364.051(5)(A), FLORIDA STATUTES, HOW SHOULD**
14 **"MEETING OFFERINGS BY ANY COMPETITIVE PROVIDER" BE**
15 **INTERPRETED? [ISSUE 3D(i)]**

16 A. The relevant passage from Section 364.051(5)(A) of the Florida Statutes states:

> 17 Nothing contained in this section shall prevent the local exchange telecommunications
> 18 company from meeting offerings by any competitive provider of the same, or
> 19 functionally equivalent, nonbasic services in a specific geographic market or to a
> 20 specific customer by deaveraging the price of any nonbasic service, packaging
> 21 nonbasic services together or with basic services, using volume discounts and term
> 22 discounts, and offering individual contracts.

23 From an economic perspective, the reference to "meeting offerings by any competitive provider"

1 should be interpreted as the ability of the regulated local exchange carrier (here, BellSouth) to
2 respond to the offering of any substitute service by any competitor operating within the same
3 market and competing for the same set of customers. A substitute need not be an identical
4 service, in terms of either its price or non-price characteristics. Rather, all that matters is that if a
5 customer for a specific BellSouth service is likely to be lured away by a competitor offering a
6 "functionally equivalent" substitute, such as by the offer of a more favorable price or other terms
7 and conditions, then regardless of any of the other rules that may apply, BellSouth should have
8 the ability within that market to attempt to retain or win back that customer by suitably altering or
9 redesigning the terms and conditions under which it offers its own service. Doing so precludes
10 BellSouth neither from repackaging or redesigning the service itself nor from offering the original
11 service at a different price or under contract.

12 **Q. PURSUANT TO SECTION 364.051(5)(A), FLORIDA STATUTES, HOW SHOULD**
13 **"SPECIFIC GEOGRAPHIC MARKET" BE INTERPRETED? [ISSUE 3D(ii)]**

14 A. From an economic standpoint, BellSouth should be allowed to respond flexibly to the actions of
15 competitors that offer either identical or substitute services within the confines of a "specific
16 geographic market." This refers to the geographic area within which a competitor offering
17 different terms and conditions (either price or non-price features) than BellSouth can induce a
18 current customer for BellSouth's service to switch. If similar actions taken by other firms cannot
19 or do not affect the customer for BellSouth's service in that fashion, then those firms do not
20 belong in the same geographic market.

1 **Q. PURSUANT TO SECTION 364.051(5)(A), FLORIDA STATUTES, HOW SHOULD**
2 **"SIMILARLY SITUATED" OR "SUBSTANTIALLY SIMILAR" BE**
3 **INTERPRETED? [ISSUE 3D(iii)]**

4 A. From an economic standpoint, the proper interpretation should be that "similarly situated" or
5 "substantially similar" customers are those whose objective circumstances with respect to a
6 specific service are similar. For example, customers with similar willingness to pay (or price
7 elasticity of demand) for a service, or facing similar competitive alternatives in the same
8 geographic market, could be considered similarly situated. Differential pricing (i.e., price
9 discrimination in the economic sense) should not be permitted for similarly-situated or
10 substantially similar customers.

11 In the context of BellSouth's Key Customer promotional offering, similarly situated
12 customers are those for whom BellSouth faces competition from rivals offering substitute services.
13 Those customers are, however, *not* similarly situated to BellSouth's other customers who do not
14 have the same competitive options.

15 **Q. PLEASE EXPLAIN WITH SPECIFIC EXAMPLES OF CUSTOMERS IN**
16 **DIFFERENT OBJECTIVE CIRCUMSTANCES.**

17 A. If one customer is capable of (or interested in) buying large quantities of a service, and another
18 only wishes to purchase small amounts, then the two customers should be regarded as being
19 differently situated. In that event, the firm should be able to offer various incentives (e.g., volume
20 discounts) to the customer that buys in bulk, but not be obliged to do the same for the customer

1 that only buys small quantities. Customers with different degrees of price sensitivity to the price
2 of the same underlying service should also be considered differently situated. In competitive
3 markets, it is commonplace to charge different prices to customers who differ in their price
4 sensitivities.

5 Finally, customers of the same underlying service may be differently situated if some
6 among them have access to multiple competitive options (such as rival offerings from BellSouth's
7 competitors), while others can only receive that service from BellSouth because of the lack of
8 competitive alternatives where they are located. Again, different prices to those two different
9 groups of customers should be permitted.

10 Similarly, other forms of differential pricing are not unfair or discriminatory, such as
11 offering term discounts to the customer that commits to making purchases over the long haul, or
12 offering a lower price to a customer at a nearby location relative to a customer at a more distant
13 location (to serve whom additional costs of transportation and delivery need to be incurred).
14 Also, as customers are differently situated (with respect to the competitive alternatives they face
15 or their sensitivity to price), the offering of the service at different prices to those customers would
16 not only *not* be unfair or discriminatory, it could actually increase consumer welfare.

17 **Q. WHAT IS THE COMPETITIVE IMPACT, IF ANY, OF THE RESALE OF**
18 **BELLSOUTH PROMOTIONAL TARIFF OFFERINGS? [ISSUE 4B]**

19 A. State and Federal regulatory rules require BellSouth to make its long-term promotional tariff
20 offerings (greater than 90 days) available to competitors at an avoided cost discount. No such

1 requirement pertains to its short-term promotions. There are valid economic reasons for this
2 distinction. If all promotional tariff offerings were subject to mandatory resale at an avoided cost
3 discount, BellSouth would have a greatly diminished incentive to offer such promotional tariffs. In
4 effect, a resale requirement would make it impossible for BellSouth to compete in some market
5 segment on the basis of price: every retail price reduction by BellSouth would result in a lower
6 wholesale price to the competitor.

7 On the other hand, the mandatory resale provisions of the Telecommunications Act of
8 1996 do have an important policy role in opening the local exchange market to competition.
9 Also, as observed above, as long as retail services are available for resale at an avoided cost
10 discount, the possibility of an anti-competitive price squeeze is eliminated.

11 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

12 A. Yes.

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Dr. Taylor received a B.A. *magna cum laude* in Economics from Harvard College, an M.A. in Statistics and a Ph.D. in Economics from the University of California at Berkeley. He has taught economics, statistics, and econometrics at Cornell and the Massachusetts Institute of Technology and was a post doctoral Research Fellow at the Center for Operations Research and Econometrics at the University of Louvain, Belgium.

At NERA, Dr. Taylor is a Senior Vice President, heads the Cambridge office and is Director of the Telecommunications Practice. He has worked primarily in the field of telecommunications economics on problems of state and federal regulatory reform, competition policy, terms and conditions for competitive parity in local competition, quantitative analysis of state and federal price cap and incentive regulation proposals, and antitrust problems in telecommunications markets. He has testified on telecommunications economics before numerous state regulatory authorities, the Federal Communications Commission, the Canadian Radio-Television and Telecommunications Commission, federal and state congressional committees and courts. Recently, he was chosen by the Mexican Federal Telecommunications Commission and Telmex to arbitrate the renewal of the Telmex price cap plan in Mexico. Other recent work includes studies of the competitive effects of major mergers among telecommunications firms and analyses of vertical integration and interconnection of telecommunications networks. He has appeared as a telecommunications commentator on PBS Radio and on The News Hour with Jim Lehrer.

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EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY
Ph.D., Economics, 1974

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M.A., Statistics, 1970

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B.A., Economics, 1968
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EMPLOYMENT

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC. (NERA)
1988- Senior Vice President, Office Head, Telecommunications Practice Director.

BELL COMMUNICATIONS RESEARCH, INC. (Bellcore)
1983-1988 Division Manager, Economic Analysis, formerly Central Services Organization, formerly American Telephone and Telegraph Company: theoretical and quantitative work on problems raised by the Bell System divestiture and the implementation of access charges, including design and implementation of demand response forecasting for interstate access demand, quantification of potential bypass liability, design of optimal nonlinear price schedules for access charges and theoretical and quantitative analysis of price cap regulation of access charges.

BELL TELEPHONE LABORATORIES
1975-1983 Member, Technical Staff, Economics Research Center: basic research on theoretical and applied econometrics, focusing on small sample theory, panel data and simultaneous equations systems.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Fall 1977 Visiting Associate Professor, Department of Economics: taught graduate courses in econometrics.

CENTER FOR OPERATIONS RESEARCH AND ECONOMETRICS
Université Catholique de Louvain, Belgium.
1974-1975 Post Doctoral Research Associate: basic research on finite sample econometric theory and on cost function estimation.

CORNELL UNIVERSITY
1972-1975 Assistant Professor, Department of Economics. (On leave 1974-1975.) taught graduate and undergraduate courses on econometrics, microeconomic theory and economic principles.

MISCELLANEOUS

1985-1995 Associate Editor, *Journal of Econometrics*, North-Holland Publishing Company.
1990- Board of Directors, National Economic Research Associates, Inc.
1995- Board of Trustees, Treasurer, Episcopal Divinity School, Cambridge, Massachusetts.

PUBLICATIONS

"Smoothness Priors and Stochastic Prior Restrictions in Distributed Lag Estimation," *International Economic Review*, 15 (1974), pp. 803-804.

"Prior Information on the Coefficients When the Disturbance Covariance Matrix is Unknown," *Econometrica*, 44 (1976), pp. 725-739.

"Small Sample Properties of a Class of Two Stage Aitken Estimators," *Econometrica*, 45 (1977), pp. 497-508.

"The Heteroscedastic Linear Model: Exact Finite Sample Results," *Econometrica*, 46 (1978), pp. 663-676.

"Small Sample Considerations in Estimation from Panel Data," *Journal of Econometrics*, 13 (1980) pp. 203-223.

"Comparing Specification Tests and Classical Tests," Bell Laboratories Economics Discussion Paper, 1980 (with J.A. Hausman).

"Panel Data and Unobservable Individual Effects," *Econometrica*, 49 (1981), pp. 1377-1398 (with J.A. Hausman).

"On the Efficiency of the Cochrane-Orcutt Estimator," *Journal of Econometrics*, 17 (1981), pp. 67-82.

"A Generalized Specification Test," *Economics Letters*, 8 (1981), pp. 239-245 (with J.A. Hausman).

"Identification in Linear Simultaneous Equations Models with Covariance Restrictions: An Instrumental Variables Interpretation," *Econometrica*, 51 (1983), pp. 1527-1549 (with J.A. Hausman).

"On the Relevance of Finite Sample Distribution Theory," *Econometric Reviews*, 2 (1983), pp. 1-84.

"Universal Service and the Access Charge Debate: Comment," in P.C. Mann and H.M. Trebing (editors), *Changing Patterns in Regulation, Markets, and Technology: The Effect on Public Utility Pricing*. The Institute of Public Utilities, Michigan State University, 1984.

"Recovery of Local Telephone Plant Costs under the St. Louis Plan," in P.C. Mann and H.M. Trebing (editors), *Impact of Deregulation and Market Forces on Public Utilities*. The Institute of Public Utilities, Michigan State University, 1985.

"Access Charges and Bypass: Some Approximate Magnitudes," in W.R. Cooke (editor), *Proceedings of the Twelfth Annual Telecommunications Policy Research Conference*, 1985.

"Federal and State Issues in Non-Traffic Sensitive Cost Recovery," in *Proceedings from the Telecommunications Deregulation Forum*. Karl Eller Center, College of Business and Public Administration, University of Arizona, Tucson, Arizona, 1986.

"Panel Data" in N.L. Johnson and S. Kotz (editors), *Encyclopedia of Statistical Sciences*. John Wiley & Sons, New York, 1986.

"An Analysis of Tapered Access Charges for End Users," in P.C. Mann and H.M. Trebing (editors), *New Regulatory and Management Strategies in a Changing Market Environment*. The Institute of Public Utilities, Michigan State University, 1987 (with D.P. Heyman, J.M. Lazorchak, and D.S. Sibley).

"Efficient Estimation and Identification of Simultaneous Equation Models with Covariance Restrictions," *Econometrica*, 55 (1987), pp. 849-874 (with J.A. Hausman and W.K. Newey).

"Alternative NTS Recovery Mechanisms and Geographic Averaging of Toll Rates," in *Proceedings of the Thirteenth Annual Rate Symposium: Pricing Electric, Gas, and Telecommunications Services*. The Institute for the Study of Regulation, University of Missouri, Columbia, 1987.

"Price Cap Regulation: Contrasting Approaches Taken at the Federal and State Level," in W. Bolter (editor), *Federal/State Price-of-Service Regulation: Why, What and How?*, Proceedings of the George Washington University Policy Symposium, December, 1987.

"Local Exchange Pricing: Is There Any Hope?", in J. Alleman (editor), *Perspectives on the Telephone Industry: The Challenge of the Future*. Ballinger Publishing Company, Cambridge, Massachusetts, 1989.

"Generic Costing and Pricing Problems in the New Network: How Should Costs be Defined and Assessed," in P.C. Mann and H.M. Trebing (editors) *New Regulatory Concepts, Issues, and Controversies*. The Institute of Public Utilities, Michigan State University, 1989.

"Telephone Penetration and Universal Service in the 1980s," in B. Cole (editor), *Divestiture Five Years Later*. Columbia University Press, New York, New York, 1989 (with L.J. Perl).

"Regulating Competition for IntraLATA Services," in *Telecommunications in a Competitive Environment*, Proceedings of the Third Biennial NERA Telecommunications Conference, 1989, pp. 35-50.

"Costing Principles for Competitive Assessment," in *Telecommunications Costing in a Dynamic Environment*, Bellcore-Bell Canada Conference Proceedings, 1989 (with T.J. Tardiff).

"Optional Tariffs for Access in the FCC's Price Cap Proposal," in M. Einhorn (ed.), *Price Caps and Incentive Regulation in the Telecommunications Industry*. Kluwer, 1991 (with D.P. Heyman and D.S. Sibley).

"Alternative Measures of Cross-Subsidization," prepared for the Florida Workshop on Appropriate Methodologies for the Detection of Cross--Subsidies, June 8, 1991.

"Predation and Multiproduct Firms: An Economic Appraisal of the Sievers-Albery Results," *Antitrust Law Journal*, 30 (1992), pp. 785-795.

"Lessons for the Energy Industries from Deregulation in Telecommunications," *Proceedings of the 46th Annual Meeting of the Federal Energy Bar Association*, May 1992.

"Efficient Price of Telecommunications Services: The State of the Debate," *Review of Industrial Organization*, Vol. 8, pp. 21-37, 1993.

"Status and Results of Regulatory Reform in the U.S. Telecommunications Industry," in C.G. Stalon, *Regulatory Responses to Continuously Changing Industry Structures*. The Institute of Public Utilities, Michigan State University, 1992.

"Post-Divestiture Long-Distance Competition in the United States," *American Economic Review*, Vol. 83, No. 2, May 1993 (with Lester D. Taylor). Reprinted in E. Bailey, J. Hower, and J. Pack, *The Political Economy of Privatization and Deregulation*. London: Edward Elgar, 1994.

"Comment on 'Pricing of Inputs Sold to Competitors,' by W.J. Baumol and J.G. Sidak," *Yale Journal on Regulation*, Vol. 11, Issue 1, 1994, pp. 225-240 (with Alfred E. Kahn).

"Comments on Economic Efficiency and Incentive Regulation," Chapter 7 in S. Globerman, W. Stanbury and T. Wilson, *The Future of Telecommunications Policy in Canada*. Toronto: Institute for Policy Analysis, University of Toronto, April 1995.

"Revising Price Caps: The Next Generation of Incentive Regulation Plans," Chapter 2 in M.A. Crew (ed.) *Pricing and Regulatory Innovations under Increasing Competition*. Boston: Kluwer Academic Publishers, May 1996 (with T. Tardiff).

"An Analysis of the State of Competition in Long-Distance Telephone Markets," *Journal of Regulatory Economics*, May 1997, pp. 227-256 (with J.D. Zona).

"An Analysis of the Welfare Effects of Long Distance Market Entry by an Integrated Access and Long Distance Provider," *Journal of Regulatory Economics*, March 1998, pp. 183-196 (with Richard Schmalensee, J.D. Zona and Paul Hinton).

"Market Power and Mergers in Telecommunications," *Proceedings of the Institute of Public Utilities; 30th Annual Conference: Competition in Crisis: Where are Network Industries Heading?* The Institute of Public Utilities, Michigan State University, 1999.

"The Baby and the Bathwater: Utility Competition, But at What Price?," Public Utilities Fortnightly, Vol. 137, No.21, November 15, 1999, pp. 48-56 (with Anne S. Babineau and Matthew M. Weissman).

TESTIMONIES

Access Charges

Florida Public Service Commission (Docket No. 820537-TP), July 22, 1983.

Arkansas Public Service Commission (Docket No. 83-042-U), October 7, 1985.

Public Utility Commission of Texas (Docket No. 8585), December 18, 1989.

Mexican Secretariat of Communications and Transport, affidavit filed October 18, 1995 (with T. Tardiff).

Federal Communications Commission (CC Docket No. 96-98), affidavit July 8, 1996; *ex parte* letters filed July 22, 1996 and July 23, 1996.

Federal Communications Commission (CC Docket No. 96-262 et. al.) with Richard Schmalensee, January 29, 1997). Rebuttal February 14, 1997.

New York Public Service Commission (Case 94-C-0095 and 28425), Panel Testimony, May 8, 1997. Rebuttal Panel Testimony July 8, 1997.

Pennsylvania Public Utility Commission (Docket No. I-00960066), June 30, 1997. Rebuttal July 29, 1997. Surrebuttal August 27, 1997.

Connecticut Department of Public Utility Control (Docket No. 96-04-07), October 16, 1997.

Federal Communications Commission (*ex parte* CC Docket No. 96-262 *et. al.*), with Richard Schmalensee, January 21, 1998.

Federal Communications Commission (CCB/CPD 98-12), March 18, 1998.

Federal Communications Commission (CC Docket Nos. 96-262, 94-1, 97-250 and RM 9210), October 26, 1998. Reply November 9, 1998.

Federal Communications Commission (Docket No. 99-24), with Karl McDermott, January 20, 1999. Reply April 8, 1999.

Vermont Public Service Board (Docket No. 6167), May 20, 1999. Supplemental May 27, 1999.
Virginia State Corporation Commission, (Case No. PUC 000003), May 30, 2000.
Maryland Public Service Commission (Case No. 8745), March 23, 2001. Rebuttal May 21, 2001. Surrebuttal June 11, 2001.

Incentive and Price Cap Regulation

Federal Communications Commission (Docket No. 87-313), March 17, 1988.
Florida Public Service Commission (Docket No. 880069-TL), June 10, 1988.
Federal Communications Commission (Docket No. 87-313), August 18, 1988. Rebuttal November 18, 1988.
New Hampshire Public Service Commission (Docket 89-010), March 3, 1989.
Federal Communications Commission (Docket No. 87-313), June 9, 1989.
Federal Communications Commission (Docket No. 87-313), August 3, 1989. (2 filings)
New York State Public Service Commission (Case 28961 - Fifth Stage), September 15, 1989.
Georgia Public Service Commission (Docket No. 3882-U), September 29, 1989.
Federal Communications Commission (Docket 87-313), May 3, 1990.
Federal Communications Commission (Docket 87-313), June 8, 1990 (2 filings).
State of Maine Public Utilities Commission (Docket No. 89-397), June 15, 1990.
Montana Public Service Commission (Docket No. 90.8.46), October 4, 1990.
Federal Communications Commission (Docket 87-313), December 21, 1990.
Tennessee Public Service Commission, February 20, 1991.
Federal Communications Commission (Docket 87-313) with Alfred E. Kahn), June 12, 1991.
California Public Utilities Commission (Phase II of Case 90-07-037) with Timothy J. Tardiff, August 30, 1991. Supplemental testimony January 21, 1992.
Rhode Island Public Utilities Commission (Docket No. 1997), September 30, 1991.
Montana Public Service Commission (Docket No. 90.12.86), November 4, 1991. Additional testimony January 15, 1992.
Federal Communications Commission (Pacific Bell Tariff F.C.C. No. 128, Transmittal No. 1579) with T.J. Tardiff, April 15, 1992. Reply comments July 31, 1992.
California Public Utilities Commission (Docket No. I.87-11-033), with T.J. Tardiff, May 1, 1992.
Delaware Public Utilities Commission (Docket No. 33), June 22, 1992.
Florida Public Service Commission (Docket No. 920260-TL), December 18, 1992.
California Public Utilities Commission (Docket No. I.87-11-033), with T.J. Tardiff, April 8, 1993, reply testimony May 7, 1993.
Canadian Radio-Television and Telecommunications Commission (Docket No. 92-78), with T.J. Tardiff, April 13, 1993 (2 filings).
Federal Communications Commission (Petition for Declaratory Ruling and Related Waivers to Establish a New Regulatory Model for the Ameritech Region), April 16, 1993. Reply Comments, July 12, 1993.
Delaware Public Utilities Commission (Docket No. 33), June 1, 1993. Supplementary statement, June 7, 1993. Second supplementary statement," June 14, 1993.
Vermont Public Service Board (Dockets 5700/5702), September 30, 1993. Rebuttal testimony July 5, 1994.

Pennsylvania Public Utility Commission (Docket No. P-009350715), October 1, 1993. Rebuttal January 18, 1994.

Massachusetts Department of Public Utilities (Docket No. D.P.U. 94-50), April 14, 1994. Rebuttal October 26, 1994.

Federal Communications Commission (CC Docket 94-1), May 9, 1994. Reply June 29, 1994.

Federal Communications Commission (CC Docket 94-1) with R. Schmalensee, May 9, 1994. Reply June 29, 1994.

New York State Public Service Commission (Case 92-C-0665), panel testimony, October 3, 1994.

State of Maine Public Utilities Commission (Docket Nos. 94-123/94-254), December 13, 1994. Rebuttal January 13, 1995.

Canadian Radio-Television and Telecommunications Commission (Application of Teleglobe Canada for Review of the Regulatory Framework of Teleglobe Canada Inc.), December 21, 1994.

Kentucky Public Service Commission, testimony re concerning telecommunications productivity growth and price cap plans, April 18, 1995.

California Public Utilities Commission (U 1015 C), May 15, 1995. Rebuttal January 12, 1996.

State of Connecticut, Department of Public Utility Control (DPUC Docket No. 95-03-01), June 19, 1995.

Louisiana Public Service Commission (Docket No. U-17949, Subdocket E), July 24, 1995.

California Public Utilities Commission (Investigation No. I.95-05-047), with R.L. Schmalensee and T.J. Tardiff, September 8, 1995. Reply September 18, 1995.

Mississippi Public Service Commission (Docket No. 95-UA-313), October 13, 1995.

Louisiana Public Service Commission (Docket No. U-20883), November 21, 1995.

Federal Communications Commission (CC Docket No. 94-1), with T. Tardiff and C. Zarkadas, December 18, 1995. Reply March 1, 1996.

North Carolina Utilities Commission (Docket No. P-7, Sub 825; P-10, Sub 479), February 9, 1996.

Rhode Island Public Utilities Commission (Docket No. 2370), February 23, 1996. Rebuttal June 25, 1996.

Pennsylvania Public Utility Commission (Docket No. P-00961024), April 15, 1996. Rebuttal July 19, 1996.

Canadian Radio-Television and Telecommunications Commission, in response to CRTC Telecom Public Notice CRTC 96-8 (2 filings), June 10, 1996.

Federal Communications Commission (CC Docket 96-262 et al.), *ex parte* March 1997.

Federal Communications Commission (CC Docket Nos. 93-193, Phase 1, Part 2, 94-65), May 19, 1997.

Vermont Public Service Board (Docket no. 6000), January 19, 1998.

Colorado Public Utilities Commission (Docket No. 97A-540T, January 30, 1998. Rebuttal May 14, 1998.

California Public Utilities Commission, affidavit on economic principles for updating Pacific Bell's price cap plan. Filed February 2, 1998.

California Public Utilities Commission, reply comments on Pacific proposal to eliminate vestiges of ROR regulation and inflation minus productivity factor formula/index, filed June 19, 1998.

Pennsylvania Public Utility Commission (Docket No. P-00981410), October 16, 1998. Rebuttal February 4, 1999.

Comisión Federal de Telecomunicaciones de México ("Cofetel"), "Economic Parameter Values in the Telmex Price Cap Plan," arbitrator's report regarding the renewal of the price cap plan for Telmex, February 15, 1999.

Kentucky Public Service Commission (Docket No. 98-292), April 5, 1999.

Federal Communications Commission (Docket Nos. 94-1, 96-26), January 7, 2000. Reply comments filed January 24, 2000, Ex parte comments filed May 5, 2000.

New Mexico Public Regulation Commission, direct testimony filed December 10, 1999.

Arizona Corporation Commission (Docket No. T-01051B-99-105), rebuttal filed August 21, 2000; rejoinder filed September 19, 2000.

Connecticut Department of Public Utilities (Docket No. 00-07-17), filed November 21, 2000.

Pennsylvania Public Utility Commission (Docket No. P-00981449), filed October 31, 2000. Rebuttal testimony filed February 20, 2001.

NERA Report: Economic Assessment of the Consumer Choice and Fair Competition Telecommunications Amendment (Proposition 108) (with Aniruddha Banerjee and Charles Zarkadas), November 2000.

Canadian Radio-Television and Telecommunications Commission, in response to CRTC Telecom Public Notice CRTC 2000-108, oral panel testimony, January 11, 2001.

Maine Public Utilities Commission (Docket No. 99-851, January 8, 2001. Rebuttal filed February 12, 2001.

Before the Massachusetts Department of Telecommunications and Energy, April 12, 2001. Rebuttal testimony September 21, 2001.

New York Public Service Commission, (Case 00-C-1945), May 15, 2001.

Canadian Radio-Television and Telecommunications Commission (Public Notice CRTC 2001-37), filed May 31, 2001, rebuttal evidence filed September 20, 2001.

The New Jersey Board of Public Utilities (Docket No. TO01020095), February 15, 2001. Rebuttal filed June 15, 2001. Supplemental rebuttal filed September 25, 2001.

Utah Public Service Commission, October 5, 2001. Rebuttal filed November 22, 2001.

New York Public Service Commission, (Case 00-C-1945), (panel testimony), filed February 11, 2002.

State of Rhode Island And Providence Plantations Public Utilities Commission (Docket Nos. 3179 and 3445). Direct testimony filed July 1, 2002 (Docket No. 3179). Rebuttal testimony filed October 22, 2002 (Docket No. 3445).

Massachusetts Department of Telecommunications and Energy (D.T.E. 01-31, Phase II (Track B)). Direct testimony filed August 28, 2002. Rebuttal testimony filed September 18, 2002.

Payphone

California Public Utilities Commission (Case 88-04-029), July 11, 1988.

Illinois Commerce Commission (Docket No. 88-0412), August 3, 1990. Surrebuttal December 9, 1991.

Michigan Public Service Commission (Case No. U-11756), October 9, 1998.

South Carolina Public Service Commission (Docket No. 97-124-C), December 7, 1998.

New Jersey Board of Public Utilities (OAL DOCKET Nos. PUCOT 11269-97N, PUCOT 11357-97N, PUCOT 01186-94N AND PUCOT 09917-98N), March 8, 1999. Surrebuttal June 21, 1999.
Louisiana Public Service Commission (Docket No. U-22632), July 17,2000.
Tennessee Regulatory Authority, Docket No. 97-00409, October 6, 2000.

Economic Costing and Pricing Principles

Florida Public Service Commission (Docket No. 820400-TP), June 25, 1986.
Delaware Public Service Commission (Docket No. 86-20, Phase II), March 31, 1989. Rebuttal November 17, 1989.
Delaware Public Service Commission (Docket No. 89-24T), August 17, 1990.
Florida Public Service Commission (Docket No. 900633-TL), May 9, 1991.
Maryland Public Service Commission (Case No. 8584, Phase II), December 15, 1994. Additional direct testimony May 5, 1995. Rebuttal testimony filed June 30, 1995.
Canadian Radio-Television and Telecommunications Commission, Response to Interrogatory SRCI(CRTC) 1Nov94-906, "Economies of Scope in Telecommunications," January 31, 1995.
Pennsylvania Public Utility Commission (Docket Nos. A-310203F0002, A-310213F0002, A-310236F0002 and A-310258F0002), March 21, 1996.
State of Connecticut, Department of Public Utility Control (DPUC Docket No. 95-06-17), July 23, 1996.
New Jersey Board of Public Utilities (Docket No. TX95120631), August 15, 1996. Rebuttal filed August 30, 1996.
Florida Public Service Commission (Docket No. 980000-SP), September 24, 1998.
Nebraska Public Service Commission, (Application No. C-1628), October 20, 1998. Reply November 20, 1998.
Florida Public Service Commission (Docket No. 980000-SP), November 13, 1998.
Wyoming Public Service Commission (Docket No. 70000-TR-99), April 26, 1999.
New Mexico Public Regulation Commission (Utility Case No. 3147), December 6, 1999, rebuttal testimony filed December 28, 1999.
New Mexico Public Regulation Commission (Case No. 3008, rebuttal testimony filed May 19, 2000.
North Dakota Public Service Commission, (Case No. PU-314-99-119), May 30, 2000.
New Mexico Public Regulation Commission (Case No. 3225, direct testimony filed August 18, 2000. Rebuttal filed September 13, 2000.
New Mexico Public Regulation Commission (Case No. 3300), rebuttal testimony filed October 19, 2000.
Alabama Public Service Commission (Docket Nos. 15957 and 27989), direct testimony filed August 3, 2001. Rebuttal testimony filed August 13, 2001. Additional rebuttal testimony filed August 17, 2001.
The New Jersey Board of Public Utilities (Docket No. TO01020095), February 15, 2001. Rebuttal filed June 15, 2001.

Statistics

Arizona State Air Pollution Control Hearing Board (Docket No. A-90-02), affidavit December 7, 1990.

Expert testimony: Michigan Circuit Court (Case No. 87-709234-CE and 87-709232-CE), *Her Majesty the Queen, et al., v. Greater Detroit Resource Recovery Authority, et al.*, February, 1992.

Expert testimony: United States District Court, Eastern District of New York, *Jancyn Manufacturing Corp. v. The County of Suffolk*, January 11, 1994.

New York Public Service Commission (Case Nos. 93-C-0451 and 91-C-1249), July 23, 1996.

New York Public Service Commission (Cases 95-C-0657, 94-C-0095, 91-C-1174 and 96-C-0036): panel testimony, March 18, 1998. Rebuttal June 3, 1998.

InterLATA Toll Competition

Canadian Radio-Television and Telecommunications Commission (Docket No. 1990-73), November 30, 1990.

Federal Communications Commission (Docket 91-141), August 6, 1991.

Federal Communications Commission (CC Docket 92-141), July 10, 1992.

Federal Communications Commission (In the Matter of Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorization Therefor) with A.E. Kahn, November 12, 1993.

U.S. District Court for the District of Columbia *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, Affidavit with A.E. Kahn, May 13, 1994.

U.S. Department of Justice, *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, August 25, 1994.

Federal Communications *ex parte* filing in CC Docket No. 94-1, March 16, 1995.

Federal Communications Commission (CC Docket No. 79-252) *ex parte* comments with J. Douglas Zona, April 1995.

U.S. Department of Justice in *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, regarding Telefonos de Mexico's provision of interexchange telecommunications services within the United States, affidavit May 22, 1995.

U.S. Department of Justice in *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, regarding provision of interexchange telecommunications services to customers with independent access to interexchange carriers, May 30, 1995.

Expert testimony: *US WATS v. AT&T*, Confidential Report, August 22, 1995. Testimony October 18-20, 25-27, 30, 1995. Rebuttal testimony December 4, December 11, 1995.

Expert testimony: United States District Court for the Northern District of Texas, Dallas Division, Civil Action 394CV-1088D, *Darren B. Swain, Inc. d/b/a U.S. Communications v. AT&T Corp.* Confidential Report, November 17, 1995.

U.S. District Court, Southern District of New York, *Multi Communications Media Inc., v. AT&T and Trevor Fischbach* (96 Civ. 2679 (MBM)), December 27, 1996.

Federal Communications Commission (CC Docket Nos. 96-262 and 96-45), March 18, 1998.

Subcommittee on Communications of the Senate Committee on Commerce, Science and Transportation, *Statement* and oral testimony regarding long distance competition and Section 271 of the Telecommunications Act of 1996, March 25, 1998.

Federal Communications Commission (CC Docket No. 96-262), with P.S. Brandon, October 16, 1998.

Federal Communications Commission (CC Docket No. 96-262) with P.S. Brandon, October 22, 1998.

IntraLATA Toll Competition

New Jersey Board of Public Utilities (Docket No. TX90050349), December 6, 1990.

New York Public Service Commission (Case No. 28425) with T.J. Tardiff, May 1, 1992.

New Jersey Board of Regulatory Commissioners (Docket No. TX93060259), Affidavit October 1, 1993.

New Jersey Board of Public Utilities (Docket Nos. TX90050349, TE92111047, TE93060211), April 7, 1994. Rebuttal April 25, 1994. Summary Affidavit and Technical Affidavit April 19, 1994.

Delaware Public Utilities Commission (Docket No. 42), October 21, 1994.

Pennsylvania Public Utility Commission (Docket No. I-940034), panel testimony, December 8, 1994. Reply February 23, 1995. Surrebuttal March 16, 1995.

Public Service Commission of West Virginia (Case No. 94-1103-T-GI), March 24, 1995.

New Jersey Board of Public Utilities (Docket No. TX94090388), April 17, 1995. Rebuttal May 31, 1995.

New York Public Service Commission (Case 94-C-0017), August 1, 1995.

Rhode Island Public Service Commission (Docket No. 2252), November 17, 1995.

Massachusetts Department of Telecommunications and Energy (Docket No. 98-85), October 20, 1998.

Local Competition

Massachusetts Department of Public Utilities (Docket No. D.P.U. 94-185), May 19, 1995. Rebuttal August 23, 1995.

The Public Utilities Commission of Ohio (Case No. 94-1695-TP-ACE), May 24, 1995.

Vermont Public Service Board (Open Network Architecture Docket No. 5713), June 7, 1995. Rebuttal July 12, 1995.

New Jersey Board of Public Utilities (with Kenneth Gordon and Alfred E. Kahn), paper filed in connection with arbitration proceedings, August 9, 1996.

Florida Public Service Commission, "Local Telecommunications Competition: An Evaluation of a Proposal by the Communications Staff of the Florida Public Service Commission," with A. Banerjee, filed November 21, 1997.

Rhode Island Public Utilities Commission (Docket No. 2681), January 15, 1999.

Connecticut Department of Public Utility Control (Docket No. 95-06-17RE02), June 8, 1999.

CPR Institute for Dispute Resolution Arbitral Tribunal, Rebuttal Affidavit in arbitrations between BellSouth Telecommunications and Supra Telecommunications & Information Systems, November 5, 2001.

Interconnection and unbundling

Federal Communications Commission (Docket 91-141), September 20, 1991.
Maryland Public Service Commission (Case No. 8584) with A.E. Kahn, November 19, 1993. Rebuttal January 10, 1994. Surrebuttal January 24, 1994.
Maryland Public Service Commission (Case No. 8659), November 9, 1994.
Federal Communications Commission (CC Docket No. 95-185), affidavit March 4, 1996.
Federal Communications Commission (CC Docket No. 96-98), videotaped presentation on economic costs for interconnection, FCC Economic Open Forum, May 20, 1996.
New York Public Service Commission (Case 01-C-0767), October 31, 2001.
Federal Communications Commission (CC Docket Nos. 01-338, 96-98, 98-47) (with Aniruddha Banerjee, Charles Zarkadas and Agustin Ros) filed July 17, 2002.
Federal Communications Commission (CC Docket Nos. 01-338, 96-98, 98-47), ex parte on local switching, October 4, 2002.
Federal Communications Commission (CC Docket Nos. 01-338, 96-98, 98-47), ex parte on inter-office transport, October 11, 2002.

Imputation

New Hampshire Public Service Commission (Docket DE 90-002), May 1, 1992. Reply testimony July 10, 1992. Rebuttal testimony August 21, 1992.
Canadian Radio-Television and Telecommunications Commission (Telecom Public Notice CRTC 95-36), August 18, 1995.
Massachusetts Department of Public Utilities (Docket No. D.P.U./D.T.E. 94-185-C), Affidavit February 6, 1998. Reply Affidavit February 19, 1998.
New Jersey Board of Public Utilities (BPU Docket No. TO97100808, OAL Docket No. PUCOT 11326-97N), July 8, 1998. Rebuttal September 18, 1998.
Vermont Public Service Board (Docket No. 6077), November 4, 1998.

Economic Depreciation

Florida Public Service Commission (Docket No. 920385-TL), September 3, 1992.
Louisiana Public Service Commission (Docket No. U-17949, Subdocket E), November 17, 1995. Surrebuttal, December 13, 1995, Further Surrebuttal, January 12, 1996.
Federal Communications Commission (CC Docket No. 98-137), with A. Banerjee, November 23, 1998.

Spectrum

Federal Communications Commission (ET Docket 92-100) with Richard Schmalensee, November 9, 1992.
Federal Communications Commission (Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, PR Docket No. 93-61), with R. Schmalensee, June 29, 1993.

Mergers

U.S. District Court for the District of Columbia, *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, with A.E. Kahn, January 14, 1994.

Vermont Public Service Board (Docket No. 5900), September 6, 1996.

Maine Public Utilities Commission (Docket No. 96-388), September 6, 1996. Rebuttal October 30, 1996.

New Hampshire Public Service Commission (Docket DE 96-220), October 10, 1996.

Federal Communications Commission (Tracking No. 96-0221), with Richard Schmalensee, October 23, 1996.

New York Public Service Commission (Case 96-C-0603), panel testimony, November 25, 1996. Reply December 12, 1996.

Federal Communications Commission (CC Docket No. 97-211), with R. Schmalensee, affidavit March 13, 1998. Reply affidavit May 26, 1998.

Connecticut Department of Public Utility Control, testimony regarding economic aspects of the SBC-SNET proposed change in control, filed June 1, 1998.

Federal Communications Commission (CC Docket No. 98-141), with R. Schmalensee, July 21, 1998. Reply November 11, 1998.

Alaskan Public Utilities Commission (Docket Nos. U-98-140/141/142 and U-98-173/174), February 2, 1999. Rebuttal March 24, 1999.

Pennsylvania Public Utility Commission (Docket Nos. A-310200F0002, A-311350F0002, A-310222F0002, A-310291F0003), April 22, 1999.

State Corporation Commission of Virginia, *In re: Joint Petition of Bell Atlantic Corporation and GTE Corporation for approval of agreement and plan of merger*, May 28, 1999.

Ohio Public Utility Commission (Docket No. 98-1398-TP-AMT), June 16, 1999.

Kentucky Public Service Commission (Docket No. 99-296), July 9, 1999.

Colorado Public Utilities Commission (Docket No. 99A-407T), December 7, 1999.

Iowa Utilities Board, rebuttal testimony, filed December 23, 1999.

Minnesota Public Utilities Commission (Docket No. P3009, 3052, 5096, 421, 3017/PA-99-1192), January 14, 2000.

Washington Utilities and Transportation Commission (Docket No. UT-991358), February 22, 2000.

Montana Public Service Commission (Docket No. D99.8.200), February 22, 2000.

Utah Public Service Commission (Docket No. 99-049-41), February 28, 2000.

Minnesota Public Utilities Commission (Docket No. P3009, 3052, 5096, 421, 3017/PA-99-1192), rebuttal affidavit filed January 14, 2000.

Minnesota Public Utilities Commission (Docket No. P3009, 3052, 5096, 421, 3017/PA-99-1192), direct testimony filed March 29, 2000.

Arizona Corporation Commission (Docket No. T-01051B-99-0497), rebuttal testimony filed April 3, 2000.

Wyoming Public Service Commission (Docket Nos. 74142-TA-99-16, 70000-TA-99-503, 74037-TA-99-8, 70034-TA-99-4, 74089-TA-99-9, 74029-TA-99-43, 74337-TA-99-2, Record No. 5134), rebuttal testimony filed April 4, 2000.

California Public Utilities Commission, (Application No. 02-01-036), testimony regarding the merger between American Water Company and Thames Water, filed May 17, 2002.

Broadband Services

Federal Communications Commission (File Nos. W-P-C 6912 and 6966), August 5, 1994.
Federal Communications Commission (File Nos. W-P-C 6982 and 6983), September 21, 1994.
Federal Communications Commission, affidavit examining cost support for Asymmetric Digital Subscriber Loop (ADSL) video dialtone market trial, February 21, 1995.
Federal Communications Commission, affidavit examining cost support for Bell Atlantic's video dialtone tariff, March 6, 1995.
Federal Communications Commission (File Nos. W-P-C 7074), July 6, 1995.
U.S. District Court for the Eastern District of Virginia (Alexandria Division), *United States Telephone Association, et al., v. Federal Communications Commission, et al.* (Civil Action No. 95-533-A), with A.E. Kahn , affidavit October 30, 1995.
Federal Communications Commission (CC Docket No. 95-145), October 26, 1995. Supplemental Affidavit December 21, 1995.
Expert testimony: *FreBon International Corp. vs. BA Corp. Civil Action*, No. 94-324 (GK), regarding Defendants' Amended Expert Disclosure Statement, filed under seal February 15, 1996.
Federal Communications Commission (CC Docket No. 96-46), *ex parte* affidavit, April 26, 1996.
Federal Communications Commission (CC Docket No. 96-112), affidavit filed May 31, 1996.
Federal Communications Commission (CC Docket No. 96-112), affidavit June 12, 1996.
Federal Communications Commission (CC Docket No. 96-46), July 5, 1996.
Pennsylvania Public Utility Commission, "Promises Fulfilled; Bell Atlantic-Pennsylvania's Infrastructure Development," filed January 15, 1999 (with Charles J. Zarkadas, Agustin J. Ros, and Jaime C. d'Almeida).
Maryland Public Service Commission (Case No. 8927), Rebuttal testimony, September 24, 2002.

Rate Rebalancing

Canadian Radio-Television and Telecommunications Commission, Implementation of Regulatory Framework and Related Issues, Telecom Public Notices CRTC 94-52, 94-56 and 94-58, February 20, 1995.
Pennsylvania Public Utility Commission (Docket No. R-00963550), April 26, 1996. Rebuttal July 5, 1996.
Pennsylvania Public Utility Commission (Docket No. R-963550 C0006), August 30, 1996.
Public Utilities Commission of Ohio (Case No. 96-899-TP-ALT), February 19, 1997.

Universal Service

Louisiana Public Service Commission (Docket No. U-20883, Subdocket A), August 16, 1995.
Tennessee Public Service Commission (Docket No. 95-02499), October 20, 1995. Rebuttal October 25, 1995. Supplementary direct October 30, 1995. Supplementary rebuttal November 3, 1995.

Mississippi Public Service Commission (Docket No. 95-UA-358), January 17, 1996. Rebuttal February 28, 1996.

Federal Communications Commission (CC Docket No. 96-45) with Kenneth Gordon, April 12, 1996.

Federal Communications Commission (CC Docket No. 96-45) with Aniruddha Banerjee, August 9, 1996.

Federal-State Joint Board (CC Docket No. 96-45), *Remarks on Proxy Cost Models*, videotape filed January 14, 1997.

New Jersey Board of Public Utilities (Docket No. TX95120631), September 24, 1997. Rebuttal October 18, 1997.

Pennsylvania Public Utility Commission (Docket No. I-00940035), October 22, 1997.

Alabama Public Service Commission (Docket No. 25980), February 13, 1998.

North Carolina Utilities Commission (Docket No. P-100, SUB 133g), February 16, 1998. Rebuttal April 13, 1998.

Mississippi Public Service Commission (Docket No. 98-AD-035), February 23, 1998. Rebuttal March 6, 1998.

Tennessee Regulatory Authority (Docket No. 97-00888), April 3, 1998. Rebuttal April 9, 1998.

Florida Public Service Commission (Docket No. 980696-TP), September 2, 1998.

Georgia Public Service Commission (Docket No. 5825-U), September 8, 2000.

Classification of Services as Competitive

Maryland Public Service Commission (Case No. 8462), October 2, 1992.

State Corporation Commission of Virginia (Case No. PUC 950067), January 11, 1996.

Maryland Public Service Commission (Case No. 8715), March 14, 1996. Surrebuttal filed April 1, 1996.

Federal Communications Commission (File No. SCL-97-003), December 8, 1997.

Pennsylvania Public Utility Commission (Docket No. P-00971307, February 11, 1998. Rebuttal February 18, 1998.

State of Connecticut, Department of Public Utility Control (Docket No. 98-02-33), February 27, 1998.

The New Jersey Board of Public Utilities (Docket No. TO 99120934), May 18, 2000.

Washington Transportation and Utilities Commission, (Docket No. UT-000883). October 6, 2000.

New York Public Service Commission, (Case 00-C-1945), May 15, 2001.

The New Jersey Board of Public Utilities (Docket No. TO01020095), February 15, 2001. Rebuttal filed June 15, 2001.

Costing and Pricing Resold Services and Network Elements

Science, Technology and Energy Committee of the New Hampshire House of Representatives, "An Economic Perspective on New Hampshire Senate Bill 77," April 6, 1993.

Tennessee Public Service Commission (Docket No. 96-00067), May 24, 1996. Refiled with the Tennessee Regulatory Authority (Docket No. 96-00067), August 23, 1996.

New York Public Service Commission (Case Nos. 95-C-0657, 94-C-0095, 91-C-1174), May 31, 1996. Additional testimony June 4, 1996. Rebuttal July 15, 1996.

Louisiana Public Service Commission (Docket No. U-U-22020), August 30 1996. Rebuttal September 13, 1996.

Tennessee Regulatory Authority (Docket No. 96-01331), September 10, 1996. Rebuttal September 20, 1996.

New Jersey Board of Public Utilities (Docket No. TO96070519), September 18, 1996.

Pennsylvania Public Utility Commission (Docket No. A-310258F0002), September 23, 1996.

Massachusetts Department of Public Utilities (Docket Nos. D.P.U. 96-73/74, 96-75, 96-80/81, 96-83, 96-94), September 27, 1996. Rebuttal October 16, 1996.

New Jersey Board of Public Utilities (Docket No. TX95120631), September 27, 1996.

New Hampshire Public Service Commission (Docket DE 96-252), October 1, 1996.

Massachusetts Department of Public Utilities (Docket Nos. D.P.U. 96-73/74, 96-75, 96-80/81, 96-83, 96-94), October 11, 1996. Rebuttal October 30, 1996.

Federal Communications Commission (CC Docket No. 96-45), October 15, 1996.

New Hampshire Public Service Commission (Docket DE 96-252), October 23, 1996.

New Jersey Board of Public Utilities (Docket No. T096080621), November 7, 1996.

Alabama Public Service Commission (Docket No. 25677), November 26, 1996.

Delaware Public Utilities Commission, testimony re costs and pricing of interconnection and network elements, December 16,1996. Rebuttal February 11, 1997.

State Corporation Commission of Virginia, (Case No. PUC960), December 20,1996. Rebuttal June 10, 1997 (Case No. PUC970005).

Public Service Commission of Maryland (Case No. 8731-II), January 10, 1997. Rebuttal April 4, 1997.

Public Service Commission of the District of Columbia (Case No. 962), January 17, 1997. Rebuttal May 2, 1997.

Connecticut Department of Public Utilities (DPUC Docket No. 96-09-22), January 24, 1997.

Connecticut Department of Public Utilities (DPUC Docket No. 96-11-03), February 11, 1997.

Federal Communications Commission, response to FCC Staff Report on issues regarding Proxy Cost Models. Filed February 13, 1997.

Public Service Commission of West Virginia (Case Nos. 96-1516-T-PC, 96-1561-T-PC, 96-1009-T-PC, and 96-1533-T-T), February 13, 1997. Rebuttal February 20, 1997.

Public Utilities Commission of Ohio (Case No. 97-152-TP-ARB), April 2, 1997.

Maine Public Utilities Commission (Docket No. 97-505), April 21, 1997. Rebuttal October 21, 1997.

Vermont Public Service Board (Docket No. 5713), July 31, 1997. Rebuttal January 9, 1998. Surrebuttal February 26, 1998. Supplemental rebuttal March 4, 1998.

State of Connecticut, Department of Public Utility Control (Docket Nos. 95-03-01,95-06-17 and 96-09-22), August 29, 1997. Rebuttal December 17, 1998.

Alabama Public Service Commission (Docket No. 26029), September 12, 1997.

Tennessee Regulatory Authority (Docket No. 97-01262), October 17, 1997.

South Carolina Public Service Commission (Docket No. 97-374-C), November 25, 1997.

Rhode Island Public Utilities Commission, direct testimony re costing and pricing principles for interconnection and unbundled network elements filed November 25, 1997.

North Carolina Utilities Commission (Docket No. P-100, SUB 133d), December 15, 1997. Rebuttal March 9, 1998.

Massachusetts Department of Public Utilities (Docket No. DTE 98-15), January 16, 1998.
Mississippi Public Service Commission (Docket No. 97-AD-544, March 13, 1998.
New Hampshire Public Service Commission (Docket No. 97-171, Phase II), March 13, 1998. Rebuttal April 17, 1998.
Massachusetts Department of Telecommunications and Energy (D.P.U. 96-3/74, 96-75, 96-80/81, 96-83, & 96-94), April 29, 1998.
Massachusetts Department of Telecommunications and Energy (Docket No. 85-15, Phase III, Part 1), August 31, 1998.
Massachusetts Department of Telecommunications and Energy (Docket No. 98-15, Phase II), September 8, 1998.
Rhode Island Public Utilities Commission (Docket No. 2681), September 18, 1998.
Maryland Public Service Commission (Case No. 8786), November 16, 1998.
New Hampshire Public Utilities Commission (Docket No. 99-018), April 7, 1999. Rebuttal April 23, 1999.
Massachusetts Department of Telecommunications & Energy (Docket No. 94-185-E), July 26, 1999.
New York Public Service Commission, (Case 98-C-1357), February 7, 2000. Panel Rebuttal Testimony filed October 19, 2000.
The New Jersey Board of Public Utilities (Docket No. TO00060356), July 28, 2000.
Massachusetts Department of Telecommunications and Energy (Docket DTE –1-20), direct testimony filed May 4, 2001.
The Public Service Commission of Maryland (Case No. 8879), May 25, 2001, rebuttal September 5, 0021. Surrebuttal October 15, 2001.
Public Service Commission of the District of Columbia (Case No. 962), July 16, 2001.
Rhode Island Public Utilities Commission (Docket No. 2681), May 1, 2002.

Bell Entry into InterLATA Markets

Federal Communications Commission (CC Docket No. 96-149), affidavit, August 15, 1996.
Federal Communications Commission (Docket No. 96-149) with Paul B. Vasington, November 14, 1996.
Georgia Public Service Commission (Docket No. 6863-U), January 3, 1997. Rebuttal February 24, 1997.
Pennsylvania Public Utility Commission, statement regarding costs and benefits from Bell Atlantic entry into interLATA telecommunications markets, February 10, 1997. Rebuttal March 21, 1997.
New York Public Service Commission, "Competitive Effects of Allowing NYNEX To Provide InterLATA Services Originating in New York State," with Harold Ware and Richard Schmalensee, February 18, 1997.
Delaware Public Utilities Commission, statement regarding costs and benefits from Bell Atlantic entry into interLATA telecommunications markets, filed February 26, 1997. Rebuttal April 28, 1997.
New Jersey Board of Public Utilities (Docket No. T097030166), March 3, 1997. Reply May 15, 1997.

Federal Communications Commission (CC Docket 96-262 *et al.*), with Richard Schmalensee, Doug Zona and Paul Hinton, *ex parte* March 7, 1997.

Public Service Commission of Maryland, statement regarding consumer benefits from Bell Atlantic's provision of interLATA service, filed March 14, 1997.

Louisiana Public Service Commission, (Docket No. U-22252), March 14, 1997. Rebuttal May 2, 1997. Supplemental testimony May 27, 1997.

Public Service Commission of West Virginia, economic analysis of issues regarding Bell Atlantic's entry into the interLATA long distance market. Filed March 31, 1997.

South Carolina Public Service Commission (Docket No. 97-101-C), April 1, 1997. Rebuttal June 30, 1997.

Kentucky Public Service Commission (Administrative Case No. 96-608), April 14, 1997. Rebuttal April 28, 1997. Supplemental rebuttal August 15, 1997.

Federal Communications Commission (CC Docket No. 96-149), April 17, 1997.

Maine Public Utilities Commission, affidavit regarding competitive effects of NYNEX entry into interLATA markets, with Kenneth Gordon, Richard Schmalensee and Harold Ware, filed May 27,1997.

Alabama Public Service Commission (Docket No. 25835), June 18, 1997. Rebuttal August 8, 1997.

North Carolina Utilities Commission (Docket No. P-55, Sub1022), August 5, 1997. Rebuttal September 15, 1997.

Mississippi Public Service Commission (Docket No. 97-AD-0321), July 1, 1997. Rebuttal September 29, 1997.

Federal Communications Commission, CC Docket No. 99-295. Filed September 29, 1999.

Federal Communications Commission, *In the Matter of Application by Verizon New England Inc., et. al. for Authorization to Provide In-Region, InterLATA Services in Massachusetts*, September 19, 2000, Reply Declaration filed November 3, 2000. Supplemental Reply Declaration filed February 28, 2001.

Pennsylvania Public Utility Commission, (Docket No. M-00001435), January 8, 2001.

Federal Communications Commission, *In the Matter of Application by Verizon New England Inc., et. al. for Authorization to Provide In-Region, InterLATA Services in Connecticut*, May 24, 2001.

Federal Communications Commission, *In the Matter of Application by Verizon Pennsylvania Inc., et. al. for Authorization to Provide In-Region, InterLATA Services in Pennsylvania*, June 21, 2001.

Alabama Public Service Commission (Docket No. 25835), June 19, 2001.

Louisiana Public Service Commission (Docket No. U-22252-E), reply affidavit filed June 25, 2001.

South Carolina Public Service Commission (Docket No. 2001-209-C), July 16, 2001.

Alabama Public Service Commission (Docket No. 25835), rebuttal testimony filed June 19, 2001.

Kentucky Public Service Commission (Docket No. 2001-105), July 30, 2001.

Mississippi Public Service Commission (Docket No. 97-AD-321), August 2, 2001.

Florida Public Service Commission (Docket No. 960786-TL, August 20, 2001.

North Carolina Utilities Commission (Docket No. P-55, SUB 1022), October 8, 2001.

Federal Communications Commission (CC Docket No. 01-277), (Georgia-Louisiana) November 13, 2001.

Minnesota Public Utilities Commission (PUC Docket No. P-421/C1-01-1372, OAH Docket No. 7-2500-14487-2) affidavit filed December 28, 2001, Surrebuttal Affidavit filed January 16, 2002.

Regulatory Reform

Federal Communications Commission (CC Docket No. 80-286), December 10, 1997.
Federal Communications Commission, *In the Matter of United States Telephone Association Petition for Rulemaking—1998 Biennial Regulatory Review*, with Robert W. Hahn, filed September 30, 1998.

Reciprocal Compensation

Massachusetts Department of Telecommunications and Energy (Docket No. 98-67), September 25, 1998.
Washington Public Utilities Commission (Docket No. UT-990300), February 24, 1999. Rebuttal March 8, 1999.
Colorado Public Utilities Commission (Docket No. 99A-001T), March 15, 1999.
Massachusetts Department of Telecommunications and Energy (Docket No. D.T.E. 97-116-B), March 29, 1999.
North Carolina Utilities Commission (Docket No. P-500, Sub 10), July 9, 1999.
North Carolina Utilities Commission (Docket No. P-561, Sub 10), July 30, 1999.
Public Service Commission of South Carolina (Docket No. 1999-259-C), August 25, 1999.
Louisiana Public Service Commission (Docket No. U-24206), September 3, 1999.
Florida Public Service Commission (Docket No. 990750-TP), September 13, 1999.
New Mexico Public Regulation Commission (Case No. 3131), October 13, 1999.
Alabama Public Service Commission (Docket No. 27091), October 14, 1999.
Tennessee Regulatory Authority (Docket No. 99-00377), October 15, 1999.
Tennessee Regulatory Authority (Docket No. 99-00430), October 15, 1999.
Mississippi Arbitration Panel (Docket No. 99-AD421), October 20, 1999.
Kentucky Public Service Commission (Case No. 99-218), October 21, 1999.
Georgia Public Service Commission (Docket No. 10767-U), October 25, 1999.
Oregon Public Utility Commission (Arb. 154), November 5, 1999.
Federal Communications Commission (Docket No. 99-68), "An Economic and Policy Analysis of Efficient Intercarrier Compensation Mechanisms for Internet-Bound Traffic," *ex parte*, November 12, 1999 (with A. Banerjee and A. Ros). Reply Comments: "Efficient Inter-Carrier Compensation for Internet-Bound Traffic," (with A. Banerjee), October 23, 2000.
Georgia Public Service Commission (Docket No. 10854-U), November 15, 1999, rebuttal testimony filed November 22, 1999.
Idaho Public Utilities Commission (Docket No. GST-T-99-1), November 22, 1999, rebuttal testimony filed December 2, 1999.
Texas Public Utility Commission (Docket No. 21982), March 15, 2000, rebuttal testimony filed March 31, 2000.
Arizona Corporation Commission (Docket Nos. T-02432B-00-0026, T-01051B-00-0026), March 27, 2000, rebuttal testimony filed April 3, 2000.

Colorado Public Utilities Commission (Docket No. 00B-011T), direct testimony filed March 28, 2000.

Pennsylvania Public Utility Commission (Docket No. A-310620F0002), April 14, 2000, rebuttal testimony filed April 21, 2000.

Delaware Public Service Commission (PSC Docket No. 00-205), filed April 25, 2000.

Virginia State Corporation Commission, filed April 25, 2000.

The New Jersey Board of Public Utilities (Docket No. TO 00031063) Direct testimony filed April 28, 2000, rebuttal testimony filed May 5, 2000.

Washington Utilities and Transportation Commission (Docket No. UT-003006). Filed April 26, 2000. Rebuttal testimony filed May 10, 2000. Surrebuttal testimony filed May 26, 2000.

The New Jersey Board of Public Utilities (Docket No. TO 00031063). Filed April 28, 2000. Rebuttal testimony filed May 5, 2000.

Federal Communications Commission, (CC Docket Nos. 96-98, 95-185, WT Docket No. 97-207), "Reciprocal Compensation for CMRS Providers," June 13, 2000 (with Charles Jackson).

Colorado Public Utilities Commission (Docket No. 00B-103T), June 19, 2000.

Federal Communications Commission, *In the Matter the Remand of the Commission's Reciprocal Compensation Declaratory Ruling by the U.S. Court of Appeals for the D.C. Circuit* (CC Docket Nos. 96-98, 99-68), July 21, 2000. Reply August 4, 2000.

Montana Department of Public Service Regulation (Docket No. D2000.6.89), July 24, 2000. Rebuttal filed February 7, 2001.

Washington Utilities and Transportation Commission (Docket 003013 Part B), filed August 4, 2000. Rebuttal filed February 7, 2001.

Nebraska Public Service Commission, (Docket No. C-2328), September 25, 2000. Rebuttal testimony filed October 4, 2000.

Montana Department of Public Service Regulation (Docket No. D2000.8.124: TouchAmerica Arbitration), October 20, 2000. Rebuttal filed December 20, 2000.

Arizona Corporation Commission (Docket Nos. T-03654A-00-0882,T-01051B-00-0882), January 8, 2001.

Florida Public Service Commission (Docket No. 000075-TP), filed January 10, 2001.

Colorado Public Utilities Commission (Docket No. 00B-601T), filed January 16, 2001.

Utah Public Service Commission (Docket No. 00-999-05), filed February 2, 2001. Rebuttal testimony filed March 9, 2001.

Arizona Corporation Commission (Docket No. T-00000A-00-0194, Phase 2), March 15, 2001.

Florida Public Service Commission (Docket No. 000075-TP), filed April 12, 2001.

Federal Communications Commission (CC Docket No. 01-92), with Aniruddha Banerjee, filed November 5, 2001.

Contract Services

Superior Court Department of the Trial Court (Civil Action No. 95-6363F), affidavit, July 1996.

Connecticut Department of Public Utilities (Docket No. 99-03-17), June 18, 1999.

American Arbitration Association, New York, *MCI WorldCom Communications Inc. v .Electronic Data Systems, Corporation,* Expert Report June 25, 2001. Supplemental Expert Report July 13, 2001.

Service Quality Performance Plans

Georgia Public Service Commission (Docket No. 7892-U), June 27, 2000.
Florida Public Service Commission (Docket No. 000121-TP), March 1, 2001. Rebuttal filed March 21, 2001. Rebuttal in Phase II filed April 19, 2001.
North Carolina Utilities Commission (Docket No. P-100 Sub 133k), May 21, 2001.
South Carolina Public Service Commission (Docket No. 2001-209-C), July 16, 2001.
Kentucky Public Service Commission (Docket No. 2001-105), July 30, 2001. Surrebuttal September 10, 2001.
Mississippi Public Service Commission (Docket No. 97-AD-321), August 2, 2001.
Tennessee Regulatory Authority, (Docket No. 01-00193), August 10, 2001.

Miscellaneous

New Mexico Public Regulation Commission (Utility Case No. 3147), December 6, 1999.
New Mexico Public Regulation Commission (Utility Case No. 3008), May 19, 2000.
United States District Court, District of Nevada (Case No. CV-S-99-1796-KJD(RJJ), December 28, 2000.
United States Bankruptcy Court, Northern District of Illinois, Eastern Division, Telesphere Liquidating Trust vs. Francesco Galesi, Adv. Proc. Nos. 95 A 1051 & 99 A 131. Report filed August 23, 2002.