

EXHIBIT 1

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Petition of Qwest Corporation for Forbearance)	WC Docket No. 09-135
Pursuant to 47 U.S.C. § 160(c) in the Phoenix)	
Arizona Metropolitan Statistical Area)	

**DECLARATION OF TIMOTHY J. TARDIFF AND DENNIS L. WEISMAN IN
SUPPORT OF THE REPLY COMMENTS OF QWEST COMMUNICATIONS**

I. Introduction

1. My name is Timothy J. Tardiff. My business address is 11 Morton Street, Newton, MA 02459. I am an economic consultant in private practice. I have specialized in telecommunications policy issues for over 25 years. I received a B.S. degree from the California Institute of Technology in mathematics (with honors) in 1971 and a Ph.D. in Social Science from the University of California, Irvine in 1974. My research has included studies of the demand for telephone services, such as local measured service and toll; analysis of the market potential for new telecommunications products and services; assessment of the growing competition for telecommunications services; and evaluation of regulatory frameworks consistent with the growing competitive trends. I have published articles in the regulatory economics literature, which in recent years have focused on policies for the increasingly competitive telecommunications industry
2. I participated in numerous legal and regulatory proceedings on issues of telecommunications economics and regulation. Since the passage of the Telecommunications Act of 1996, I have participated in interconnection arbitrations, unbundled element proceedings, universal service investigations, applications by incumbent local exchange carriers for authorization to provide interLATA long-distance, and implementation of the Triennial Review Order rules for unbundling

network elements in over 25 states and before the Federal Communications Commission (“FCC”). My international research and consulting experience includes studies and expert reports on telecommunication competition and interconnection issues in Canada, Japan, New Zealand, Peru, Thailand, Australia, and Trinidad and Tobago. I attach a copy of my full resume as Exhibit 1.

3. My name is Dennis L. Weisman. I am employed by Kansas State University as a Professor of Economics. My business address is Department of Economics, Waters Hall, Kansas State University, Manhattan, Kansas 66506-4001. I received a B.A. in economics and mathematics from the University of Colorado; an M.A. in economics from the University of Colorado; and a Ph.D. in economics from the University of Florida with a specialization in industrial organization and regulation. I have testified in numerous regulatory proceedings to the economic and social impacts of regulatory policies and have served as an advisor to telecommunications firms, electric power companies and regulatory commissions on economic pricing principles, the design of incentive regulation plans and competition policies

4. My primary research interests are in strategic behavior and government regulation. I have authored or co-authored more than 85 articles, books and book chapters. My research has appeared in the Antitrust Bulletin, Economics Letters, the Journal of Regulatory Economics, the Yale Journal on Regulation, the Journal of Policy Analysis and Management, the Southern Economic Journal and the Federal Communications Law Journal. My research has also been cited by the U.S. Supreme Court in Verizon v. FCC, both majority and dissenting opinions. I am the co-author of Designing Incentive Regulation for The Telecommunications Industry, published by the MIT Press and the AEI Press in 1996, and The Telecommunications Act of 1996: The “Costs” of Managed Competition, published by Kluwer in 2000. I am also the author of Principles of Regulation and Competition Policy for the Telecommunications Industry - A Guide for Policymakers, published by The Center for Applied Economics at the University of Kansas, School of Business in 2006. I currently serve on the editorial boards of the Journal of Regulatory Economics,

Information Economics and Policy and The Review of Network Economics. I attach a copy of my full resume as Exhibit 2.

5. The primary purpose of this declaration is to evaluate from an economic perspective the comments of the parties opposing Qwest's petition for forbearance in the Phoenix, Arizona Metropolitan Statistical Area (MSA). Because the arguments proffered by these parties are generally similar to those offered by interests opposing regulatory reforms and/or deregulation in other contexts (e.g., state regulatory proceedings considering retail price deregulation), we have developed a set of economic principles intended to inform deliberations on whether to maintain current regulatory regimes or relax and/or eliminate such regimes as competitive forces intensify, which we attach as Exhibit 3.¹ We use these principles to frame our response to the economic arguments of opposing parties, which generally advocate an excessively narrow and time-limited assessment of the strength of competitive alternatives to Qwest's services in an attempt to encourage this Commission to continue to maintain extensive unbundling obligations, despite the competition that continues to grow, both in Phoenix and throughout the U.S.
6. The remainder of this declaration is organized as follows. We summarize the major economic arguments of the opposing parties in Section II. In Section III, we draw on our economic principles to explain why these arguments are economically incorrect. Section IV provides a brief summary and conclusion.

II. Summary of Opposing Economic Arguments

7. While differing somewhat in specific details, the comments of opposing parties in this proceeding² and the parallel remand proceeding³ generally address the following common themes:⁴

¹ Dennis L. Weisman and Timothy J. Tardiff, "Principles of Competition and Regulation for the Design of Telecommunications Policy," October 2009 (Exhibit 3 to this declaration).

² Opposition of Paetec Holding Corp. , Before the Federal Communications Commission, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, September 21, 2009 at 19-20 ("Paetec Opposition"); Opposition of Covad Communications Company; Alpheus Communications, L.P.; U.S. Telepacific Corp. and Mpower Communications Corp., both d/b/a Telepacific Communications; First

- In considering whether there is sufficient competition for incumbent's services, the opposing parties argue the product market should be defined narrowly. In particular, they argue that "intermodal" alternatives—in particular, wireless and voice over Internet protocol (VoIP) —should not be considered as competitive alternatives to incumbent services.⁵ To a large

Communications, Inc.; Deltacom, Inc.; Trucom LLC d/b/a Citynet – Arizona; and TDS Metrocom, LLC , Before the Federal Communications Commission, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, September 21, 2009 at 19-20 ("Covad, et al. Opposition"); Initial Comments of Broadview Networks, Inc., Nuvox, and XO Communications, LLC, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, September 21, 2009 at 19-20 ("Broadview, et al. Opposition"); Cavalier Telephone, LLC Opposition to Qwest Petition for Forbearance , Before the Federal Communications Commission, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, September 21, 2009 at 19-20 ("Cavalier Opposition"); Comptel's Opposition to Qwest Petition for Forbearance , Before the Federal Communications Commission, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, September 21, 2009 at 19-20 ("Comptel Opposition"); and Opposition of Integra Telecom, Inc., TW Telecom, Inc., Cbeyond, Inc., and One Communications Corp., *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area*, WC Docket No. 09-135, September 21, 2009 at 19-20 ("Integra, et al. Opposition").

³ Comments of Paetec Holding Corp. , Before the Federal Communications Commission, *In the Matter of Petition of the Verizon Telephone Companies for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Boston, Philadelphia, Pittsburgh, Providence, and Virginia Beach Metropolitan Statistical Areas*, WC Docket No. 06-172, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Denver, Minneapolis-St. Paul, Phoenix, and Seattle Phoenix, Arizona Metropolitan Statistical Areas*, WC Docket No. 07-97, September 21, 2009 at 19-20 ("Paetec Remand Comments") and Comment of Covad Communications Company; Alpheus Communications, L.P.; U.S. Telepacific Corp. and Mpower Communications Corp., both d/b/a Telepacific Communications; First Communications, Inc.; Deltacom, Inc.; Trucom LLC d/b/a Citynet – Arizona; and TDS Metrocom, LLC , Before the Federal Communications Commission, *In the Matter of Petition of the Verizon Telephone Companies for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Boston, Philadelphia, Pittsburgh, Providence, and Virginia Beach Metropolitan Statistical Areas*, WC Docket No. 06-172, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Denver, Minneapolis-St. Paul, Phoenix, and Seattle Phoenix, Arizona Metropolitan Statistical Areas*, WC Docket No. 07-97, September 21, 2009 ("Covad, et al. Remand Comments").

⁴ Apparently, none of the opposing parties have offered expert economic analysis specific to Qwest's Phoenix petition in this docket. Instead, they have referenced documents prepared for other proceedings and/or jurisdictions. In particular, Cavalier attached the Declaration of Michael D. Pelcovits in WC Dockets 08-24 and 08-49 (Verizon's Virginia Beach and Rhode Island Forbearance proceedings), Covad, et al. cited a California study (Trevor R. Roycroft, "Why 'Competition' is Failing to Protect Consumers-Full Report," The Utility Reform Network, March 25, 2009.), and Integra cited Kent W. Mikkelsen, "Mobile Wireless Service to 'Cut the Cord' Households in FCC Analysis of Wireline Competition," which was attached to a 2008 *ex parte* in an earlier Qwest forbearance docket. While our comments do not directly address these documents, we have reviewed them and note that the analyses contained therein are generally the same as those that we describe and critique in these comments.

⁵ Integra, et al. Opposition at 24-27; Paetec Opposition at 8-13; Paetec Remand Comments at 43-45; Covad, et al. Opposition at 8-13; Covad, et al. Remand Comments at 42-44; Cavalier Opposition.

extent, this position boils down to the proposition that the only legitimate substitutes for incumbent services are technological “clones” of the incumbent’s offerings.⁶

- Having artificially narrowed the range of eligible alternatives, the opposing parties conclude that the resulting market structure is a duopoly.⁷ And based on observations made in other contexts (e.g., in decisions weighing the merits of mergers that would reduce the number of competitors from three to two), advocates of this conclusion claim that such a market is not sufficiently competitive to warrant forbearance from regulation.
- Regardless of the strength of competition for retail services, opponents of Qwest’s petition would only grant forbearance if a vibrant market for wholesale inputs were guaranteed after forbearance were granted.⁸ In support of their position, proponents forthrightly acknowledge their objective of protecting companies whose business plans depend on the availability of such wholesale markets, with Unbundled Network Elements (“UNEs”) available at low TELRIC-based rates.
- In determining whether forbearance is warranted, opposing parties argue that this Commission should employ a market power analysis similar to the approach U.S. competition authorities use to analyze the efficacy of proposed mergers.⁹ In particular, this position would require a rigid and unrealistically high “market share”¹⁰ (in an artificially narrow “market”),

⁶ Such a position is similar to arguing that Toyota is a monopolist in the “market” for the Toyota Camry because no other carmaker produces that specific car. The key point here is that even though Toyota is the only maker of the Camry—just as Qwest may be one of only a few providers of wired services—this does not establish the existence of market power for that particular product.

⁷ Paetec Remand Comments at 6-9 and 12-19; Covad, et al. Remand Comments at 6-8 and 11-19..

⁸ Comptel Opposition at 26-37; Broadview, et al. Opposition at 42-52; Covad, et al. Remand Comments at 8-11 and 41-42; Paetec Remand Comments at 9-12 and 42-43. .

⁹ Paetec Remand Comments at 40-41; Covad, et al. Remand Comments at 39-41; Broadview, et al. Opposition at 17-18; Integra, et al. Opposition at 9..

¹⁰ In particular, these parties would require two additional wireline carriers (Paetec Remand Comments at 29; Covad, et al. Remand Comments at 28; Integra, et al. Opposition at 9). Integra also proposes that each such carrier (1) be capable of serving at least 75 percent of the market and (2) that each such carrier have a current market share of at least 15 percent.

based primarily on *current* customer volumes,¹¹ rather the *potential* for serving customers that available capacities in competing networks could accommodate. The FCC has clearly articulated that the objectives and analysis used to determine whether unbundled network elements should be mandated at regulated prices (impairment) differs from a standard market power analysis.¹² Accordingly, the opposing parties' position would represent a major departure from the current objectives and processes for establishing and maintaining mandatory access to unbundled network elements.

III. Economic Evaluation of Opposing Economic Arguments

8. In this section, we apply the principles developed and discussed in Exhibit 3 to each of the major components of opposing parties' forbearance recommendations.

A. Intermodal Alternatives Should be Considered in Forbearance Determinations

9. As we observed in our discussion of Principle 10: "Policymakers have recognized that (i) subscription to both wireless and wireline does not imply that the two services are complements, and (ii) wireless provides competitive discipline on wireline prices." This growing trend in domestic and international markets (for example, under Canadian regulations, unaffiliated wireless providers have been considered in decisions to forbear from retail price regulation of incumbents' services in geographic areas that account for substantial majorities of residential and business lines) is also consistent with the steady increase in the proportion of households that rely exclusively (or almost exclusively) on wireless service. Indeed, the most recent national statistics reveal a one-year increase in such households from approximately

¹¹ Paetec Opposition at 23-25; Paetec Remand Comments at 33; Covad, et al. Opposition at 23-25; Covad, et al. Remand Comments at 32-33.

¹² Federal Communications Commission, *In the Matter of Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, WC Docket No. 04-313, CC Docket No. 01-338, Order On Remand, Released February 4, 2005 at ¶ 109 ("TRRO").

29% to 35%.¹³ When growing numbers of customers are availing themselves of such intermodal alternatives (including the services provided by traditional cable companies), continuing asymmetric regulation of incumbent providers would distort the competitive process to the detriment of dynamic efficiency gains (Principle 1: “The optimal regulatory policy should recognize the tradeoffs between static and dynamic efficiency and its implications for consumer welfare.”) and ultimately consumer welfare. The Commission followed this “static” approach in transitioning to competition the long-distance markets and ultimately concluded that consumers likely paid higher prices as a result.

B. The Markets in which Incumbents such as Qwest Compete Are Not Duopolies

10. First and foremost, opponents’ assertions of duopoly markets are the result of “legislating” legitimate economic substitutes out of the analysis. In short, the “duopoly” label mischaracterizes the nature of competition and any conclusions drawn from such incorrect premises are patently incorrect as a matter of logic. That is, to the extent that measures such as the number of competitors and/or market shares are used to make inferences about market power, refusing to include viable economic alternatives will result in faulty conclusions that such markets are unduly concentrated.¹⁴
11. Even if (contrary to fact) these telecommunications markets were duopolies, it does not necessarily follow that continued regulation is warranted. As we discuss under Principle 2 (“The optimal regulatory policy should balance Type I errors (regulating when market forces provide sufficient competitive discipline) and type II errors (not

¹³ Stephen J. Blumberg and Julian V. Luke, “Early Release of Estimates From the National Health Interview Survey (NHIS), July –December 2008,” Division of Health Interview Statistics, National Center for Health Statistics, May 2009 and Stephen J. Blumberg and Julian V. Luke, “Early Release of Estimates From the National Health Interview Survey (NHIS), July –December 2007,” Division of Health Interview Statistics, National Center for Health Statistics, May 2008.

¹⁴ In the Omaha forbearance order, this Commission rejected the characterization of the market as a duopoly, based on the continued actual and potential competition from competitors that avail themselves of inputs provided by the Telecommunications Act that are still available after forbearance is granted. Memorandum Report and Order, *Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, Released December 2, 2005, ¶ 71 (“Omaha Forbearance Order”)

regulating when market forces provide insufficient competitive discipline) so as to minimize the expected social cost of error.”), the fundamental issue is not whether competition is likely to approach perfection, but whether the costs of continuing regulation (primarily the attenuation of investment incentives) outweigh the costs of premature forbearance. And in making such an assessment, it is important to account for the possibility that any apparent lack of competition may be an artifact of historical regulatory distortions, rather than the fundamental competitive structure of the markets at issue (Principle 5: “Any dearth of competition in retail telecommunications markets is likely an artifact of regulatory-rate distortions that served to suppress competition.”)

12. Opponents quote various regulatory and competition authorities in other contexts as support for the proposition that duopoly markets are not sufficiently competitive. Again, the critical question is not whether more competition now is better than less (everything else being the same), but whether continued regulation is superior to relaxed regulation in conferring dynamic and static efficiency benefits on consumers. Indeed, in the case of mergers, while merger authorities may be inclined to deny a merger that results in a duopoly (or require divestiture of those geographic markets that would become duopolies), it is also the case that society does not routinely impose price (or other forms of) regulation on markets that are highly concentrated by conventional standards. What this suggests is a bit of introspection on the part of the Commission into the question as to whether regulation is the solution or the problem.
13. Perhaps the most germane example was this Commission’s sequence of decisions to first eliminate the requirement that incumbents share subscriber lines with competing digital subscriber line (DSL) providers in 2003 and its 2005 decision (with intervention from the Courts) to end the obligation of incumbent telecommunications providers to share wholesale elements used in the provision of broadband services.¹⁵

¹⁵ Federal Communications Commission, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket No. 01-338, Report and Order and Order On Remand and Further Notice of Proposed Rulemaking (“TRO”), Released August 21, 2003, ¶ 199. Federal Communications Commission, *In the Matter of Appropriate Framework for Broadband Access to Internet over Wireline Facilities*, CC Docket No. 02-33, Report and Order and Notice of Proposed Rulemaking, Released September 23, 2005

At the time of those decisions, provision of broadband access was effectively a duopoly consisting of cable modem and incumbent DSL offerings.¹⁶ And contrary to the suggestions of the opposing parties that consumers are necessarily harmed when regulatory restrictions in duopoly markets are eased, analysis of subsequent market developments resulted in the conclusion that “[t]he evidence in U.S. broadband markets suggests that efficiency gains from deregulation.”¹⁷

C. The Continued Existence of a Wholesale Market should not be a Prerequisite for Forbearance

14. As we describe in Exhibit 3, wholesale markets are relevant to the implementation of the 1996 Telecommunications Act only insofar as they are required for competition in retail markets (Principle 9). The fundamental reason for our conclusion lies in Principle 3: “The optimal regulatory policy should be platform-neutral and competitor-neutral in that it should serve to protect the integrity of the competitive process rather than individual competitors.” In other words, as the FCC’s impairment standard¹⁸ (and competition law and sound economics, in general) recognizes, telecommunications policies should facilitate competition on the merits among efficient competitors, and not favor or handicap particular firms employing specific technologies and business models.
15. The corollary to these principles is that if efficient retail competition is possible without particular (or any) wholesale elements, then mandating the unbundling of such elements at regulatory prescribed rates would be counterproductive to the competitive process. Indeed, in its decisions not to require incumbents to provide (1) unbundled network elements at regulated prices to wireless and long-distance companies; or (2) unbundled local switching at regulated rates, the Commission recognized that retail competition had proceeded (or was likely to proceed) absent

¹⁶ Subsequently, wireless broadband services have achieved substantial shares of customers, so that the market structure is generally no longer a duopoly.

¹⁷ Thomas W. Hazlett and Anil Caliskan, “Natural Experiments in U.S. Broadband Regulation,” *Review of Network Economics*, Vol. 7, Issue 4, December 2008, pp. 460-480.

¹⁸ TRRO, ¶ 21-22.

heavy-handed regulation of certain parts of wholesale “markets.”¹⁹ There is no credible evidence on the record to suggest that the Commission’s decisions in this regard were in error.

D. Standard Market Power Analyses are not a Proper Basis for Determining whether Forbearance is Warranted

16. Opposing parties’ recommendation of standard market power analyses to determine whether forbearance is warranted is fundamentally flawed for a number of reasons. First, despite the fact that facilities-based competition has strengthened considerably in recent years, thus rendering dynamic efficiency relatively more important, a market power focus would tilt the balance away from a proper weighing of dynamic versus static efficiency (Principle 1). In particular, this Commission recently reported that between mid-2005 and mid-2008, while incumbents’ subscriber lines in Arizona have decreased by over 16%, facilities-based wireline competitors’ lines (CLEC-owned) increased by about 51% . And over the same time period, the number of wireless subscribers in Arizona increased by 39 percent. Indeed, the number of Arizona wireless subscribers now exceeds the number of wired lines (incumbents and competitors) by 61 percent.²⁰ Paradoxically, the more consumers demonstrate through their consumption behavior that wireless and wireline are substitutes, the louder the pronouncements of the opposing parties that they are not.
17. Significantly, in establishing its impairment standard, this Commission clearly distinguished between an impairment analysis (a policy to facilitate competition by efficient providers) and a market power analysis (whether competition is sufficient to ensure just and reasonable rates). The Commission’s previous determination is summarized in Principle 8: “The purpose of mandatory unbundling is not to control market power *per se*, but rather to enable competition that would not be possible

¹⁹ TRO, ¶ 34.

²⁰ *Local Telephone Competition: Status as of June 30, 2008*; Industry Analysis and Technology Division, Wireline Competition Bureau, July 2009, Tables 9, 10, 11, and 14 and *Local Telephone Competition: Status as of June 30, 2005*; Industry Analysis and Technology Division, Wireline Competition Bureau, April 2006, Table 11. Nationally, from mid-2005 to mid-2008, incumbent subscriber lines decreased by 13 percent, facilities-based CLEC lines increased by 44 percent, and wireless subscribers increased by 33 percent—to a point where wireless subscribers exceed the number of wired lines by 65 percent.

otherwise.” An impairment standard based on this rationale is economically sensible primarily because given the technological, competitive, and economic characteristics of the industry, it strikes a better balance between dynamic and static efficiency than would a market power standard.²¹ In particular, while “passing” a standard market power assessment would be sufficient to conclude that efficient competition can proceed without mandatory unbundling, it is hardly necessary for such a stringent standard to be met before it is safe to conclude that efficient competition is feasible.

18. Of course, the opposing parties’ recommendation that “intermodal” alternatives not be considered would put a finger on the static efficiency side of the scale to an even greater extent. Further, even if all economically relevant competitors were included in a standard market power analysis, there are several reasons why such an analysis would be overly restrictive when applied to the telecommunications industry. In particular, conventional market share and concentration metrics for determining market power can be especially misleading when (1) the industry was pervasively regulated prior to the onset of competition, (2) regulation served to peg certain prices to sub-competitive levels, and (3) the industry has a cost structure with a high proportion of fixed and/or sunk costs. For example, the *Merger Guidelines*’ standard discussed by some opposing parties²² that a market with fewer than five equal-sized competitors is “highly concentrated” would almost inevitably lead to erroneous conclusions about market power and whether deregulatory measures such as forbearance were justified. Indeed, as we describe in Exhibit 3 (pp. 23-24), this Commission acknowledged the shortcomings of such standards when it evaluated competition in wireless markets.

19. When industries have been regulated, the consideration of market shares (and associated concentration measures, such as Herfindahl-Hirschman Indices (HHI)), which are essentially static and backward looking, can lead to erroneous conclusions about market power. (Principle 4: “Market share tests are inherently problematic in

²¹ While the Commission’s impairment standard is based on sound theoretical reasoning, its implementation (based on counts of incumbent’s business lines and collocations) may not accurately measure the amount of actual or potential competition arising from facilities-based providers.

²² See, for example, Covad, et al. Remand Comments at 30.

regulated industries and the Commission should not rely upon them to draw inferences about market power”). As one of the classic articles on market power long ago observed:

In view of the growing importance of antitrust enforcement in regulated industries, we shall note briefly the significant limitations of our formal analysis when applied to a market in which rates are regulated by a government agency. To the extent that regulation is effective, its effect is to sever market power from market share and thus render our analysis inapplicable...

For example, in many regulated industries firms are compelled to charge uniform prices in different product or geographical markets despite the different costs of serving the markets. As a result, price may be above marginal cost in some markets and below marginal cost in others. In the latter group of markets, the regulated firm is apt to have 100% market share. The reason is not that it has market power but that the market is so unattractive to other sellers that the only firm that will serve it is one that is either forbidden by regulatory fiat to leave the market or that is induced to remain in it by the opportunity to recoup its losses in other markets, where the policy of uniform pricing yields revenues in excess of costs. In these circumstances, a 100% market share is a symptom of a lack, rather than the possession, of market power. (footnotes omitted)²³

20. Landes and Posner’s cogent analysis also informs our closely related Principle 6: “Historical ratemaking polices in telecommunications that diverge from the competitive standard can lead regulators astray in applying standard market definition guidelines.” In short, standard market share and concentration measures may reveal little or nothing about the competitiveness of a regulated industry, in general, and telecommunications, in particular. This observation notwithstanding, we note that to the extent that a market share measure is used to infer market power, Landes and Posner’s analysis recommends the use of capacities, rather than current customer volumes in calculating such shares. Consider, for example, a particular market in which the ILEC and a cable company compete. Suppose the cable company quickly garners 5 percent of the customers and the ILEC files for deregulation. There may be a tendency to conclude that the ILEC continues to maintain market power since it has

²³ William W. Landes and Richard A. Posner, “Market Power in Antitrust Cases.” *Harvard Law Review*, Volume 94, Number 5, March 1981, p. 975- 976.

95 percent of the customers. And yet, if capacity is truly the relevant measure of market share, and both the ILEC and the cable company are able to address 100 percent of the customers, the ILEC's market share is actually only 48.72 percent ($95/(95 + 100)$).

21. As this hypothetical example demonstrates, a capacity measure reflects the ability of competitors to expand and take on greater volume if a rival attempted unilaterally to increase prices above a competitive level, e.g., it is indicative of relatively high supply elasticity. As such, capacity measures the *potential* volume rivals are capable of serving, rather than their current actual volume. Thus, sound economic analysis supports the weight that this Commission has given to potential competition in earlier forbearance determinations.²⁴

22. Finally, more recent economic analysis has demonstrated that the cost characteristics of facilities-based telecommunications firms can serve to constrain prices, even at conventionally high levels of market share and market concentration. And this tendency is reinforced when competing firms offer an increasing array of complementary services as is the case in telecommunications. The reasoning is straightforward. When a firm's cost structure has high levels of costs that do not vary with volume, the prices it charges must be well above incremental (marginal) cost in order to recover all of its costs. Therefore, even a modest loss in sales can result in sufficient erosion of profits to make an attempted price increase uneconomic. And if revenues from complementary high-margin services are also lost when a customer chooses another provider (for example, revenues from services such as calling features and voice mail), the loss of even fewer customers as a result of an attempted price increase would render that decision uneconomic. Thus, the cost structure characteristic of facilities-based telecommunications firms result in the general proposition that a little competition can go a long way. These observations are the basis for Principle 7: "The cost structure for wireline providers (i.e., pronounced

²⁴ For example, in its 1995 decision to classify legacy AT&T as nondominant in the provision of long-distance services, this Commission examined the capacity of competing carriers to expand in its analysis of supply elasticity. In the Matter of Motion of AT&T to be Reclassified as a Non-Dominant Carrier, FCC 95-427, *Order*, October 23, 1995. Similarly, in its Omaha forbearance order, the Commission considered actual and potential competition from both Cox and other providers. Omaha Forbearance Order. ¶ 62.

scale/scope economies) and the corresponding high price-cost margins required for financial viability implies that relatively modest levels of competition may be sufficient to impose the requisite pricing discipline.” In other words, the phrase that “competition occurs at the margin” means that it is the marginal customers, those willing to substitute alternative services in the face of a price increase, that serve to impose pricing discipline on the market provider.²⁵ This observation has special significance for wireline providers because it implies that a relatively small percentage of customers (the “marginal customers”) willing to discontinue service or switch to alternative service providers in the face of a price increase are sufficient to provide the requisite competitive discipline.

23. Therefore, to the extent that static measures such as market share/concentration are considered in forbearance determinations, particular benchmarks that might inform other decisions, are not likely to provide credible information about the competitiveness of telecommunications markets. For example, our analysis supports the [Canadian] government’s determination that a large proportion of Canadian retail services no longer require price regulation, even though incumbents maintained market shares on the order of 80 percent when such determinations were made. On the other hand, in other industries, blocking a merger that would increase the share of the largest firm to 80 percent may also make economic sense because the industry’s cost structure may not be conducive to the same price-constraining pressures that are present in the telecommunications industry. Furthermore, dynamic efficiency considerations must, of necessity, be given primacy in the Commission’s deliberations even though such weight may not be appropriate in typical merger cases.

IV. Conclusion

24. The opposing parties in this proceeding engage in a number of tactics that are specifically designed to understate the degree of competition for telecommunications

²⁵ See, for example, Jerry A. Hausman., “Regulated Costs and Prices in Telecommunications,” in Gary Madden (ed.), *International Handbook of Telecommunications Economics, Volume 2: Emerging Telecommunications Networks*, 2003, p. 226.

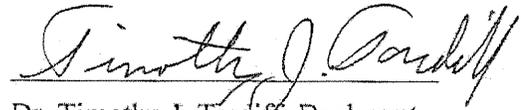
services in Phoenix and other market areas throughout the United States. These tactics include, but are not limited to, (1) strategic use of market definition guidelines to narrowly define the market for the purpose of overstating market power; (2) creating the fiction of a duopoly by ignoring the facts and simply declaring that wireless is not in the same product market as wireline; (3) supporting protectionist regulatory policies that confuse protecting the integrity of the competitive process with protection of individual competitors; and (4) conflating the objective of fostering competition in the 1996 Telecommunications Act with a separate objective of fostering competition in wholesale markets.

25. We have relied upon our economic principles to rebut the positions of these opposing parties and expose the fallacies in their arguments. In addition, historical experience in transitioning telecommunications markets towards competition is also noteworthy in two respects. First, the opposing parties advocate the same type of protectionist policies that accompanied the transition to competition in long distance markets. The overwhelming weight of the evidence is that those policies, which relied heavily on asymmetric regulation of the incumbent provider, AT&T, did not serve consumers well. The high social costs of those policies include not only prices that were higher than would otherwise have been the case, but also products and services that did not find their way to market, but would have otherwise. Second, the opposing parties in this proceeding advocate a rigid interpretation of actual market share and market concentration metrics that this Commission has previously rejected (e.g., in evaluating the competitiveness of wireless markets)²⁶ in situations in which they did not serve to credibly inform the record.

²⁶ See, for example, In the Matter of Applications of AT&T Wireless, Inc. and Cingular Wireless Corporation for Consent to Transfer Control of Licenses and Authorizations, etc, WT Docket Nos. 04-70, 04-254, and 04-323, *Memorandum Opinion and Order*, October 26, 2004, ¶ 148.

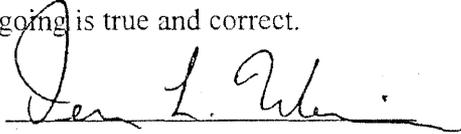
I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 20, 2009


Dr. Timothy J. Tardiff, Declarant

I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 20, 2009

A handwritten signature in black ink, appearing to read "Dennis L. Weisman", written over a horizontal line.

Dr. Dennis L. Weisman, Declarant

Dr. Timothy J. Tardiff, Declarant

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Curriculum Vitae

Dr. Tardiff has more than 30 years of academic and consulting experience. He has participated in numerous legal and regulatory proceedings regarding telecommunications, economics, anti-trust, and regulation issues. His research consulting, and expert witness experience in telecommunications has addressed pricing and costing issues involving increasingly competitive services, such as wireless and traditional wireline services. This experience has also included extensive examination and economic evaluation of all facets of the costing methodologies used to establish prices in rate-regulated industries. His work has included the telecommunications, transportation, energy, and public utility industries, and he has published extensively in economics, telecommunications, and transportation journals. Dr. Tardiff holds a Ph.D. in Social Science from the University of California, Irvine and a B.S. in mathematics from the California Institute of Technology.

Professional experience

Dr. Tardiff is an economic consultant with clients in the telecommunications and regulated utilities industries. From 2006 to 2009, he was a Managing Director at Huron Consulting Group. Prior to joining Huron, Dr. Tardiff served as a vice president in the telecommunication practice at NERA Economic Consulting. During his career, he has served as the director of Marketing Research and senior member of the transportation practice at Charles River Associates, Inc. and assistant professor in the Department of Civil Engineering and Division of Environmental Studies at the University of California, Davis.

His research has addressed the demand, cost, and competitive aspects of converging technologies, including wireless and broadband. He has evaluated pricing policies for increasingly competitive telecommunications markets, including appropriate mechanisms for pricing access services to competitors and studied actual and potential competition for services provided by incumbent telephone operating companies. Most recently, he has analyzed the effects of convergence and growing intermodal competition on whether incumbent firms should be considered dominant in the provision of certain services and the regulatory and antitrust implication of such determinations.

Since the passage of the United States Telecommunications Act, he has participated in interconnection arbitrations, unbundled element proceedings, universal service investigation, applications by incumbent local exchange carriers for authorization to provide interLATA long-distance, and implementation of the Triennial Review Order rules for unbundling network elements in over 25 states and before the United States Federal Communications Commission. His international research and consulting experience includes studies and expert reports on telecommunication competition issues in Canada, Japan, New Zealand, Peru, Australia, and Trinidad and Tobago, where he was an economic expert in an interconnection arbitration between two wireless carriers.

Dr. Tardiff has also participated in class action litigation in regulated (or partially regulated) industries. This experience includes analysis of the commonality of proposed class members in an antitrust claim that a regional telephone operator failed to implement the provision of the 1996 Telecommunications Act as well as evaluation of the damage claims of plaintiffs in securities actions involving providers of telecommunications network services.

He has recently provided expert reports and testimonies on the reasonableness from an economic perspective of increases in the rates international carriers at Los Angeles International Airport pay for use of terminal space.

Testimony experience

- Deposition Testimony, Florida Power Corporation d/b/a Progress Energy Florida, Inc., Plaintiff v. Verizon Florida LLC, Defendant, Case No: 08-013358, Circuit Court in and for Hillsborough County, Florida Civil Division, August 27, 2009.
- Expert Rebuttal Report, Florida Power Corporation d/b/a Progress Energy Florida, Inc., Plaintiff v. Verizon Florida LLC, Defendant, Case No: 08-013358, Circuit Court in and for Hillsborough County, Florida Civil Division, August 4, 2009 (with Matthew G. Medlin).
- Expert Report, Florida Power Corporation d/b/a Progress Energy Florida, Inc., Plaintiff v. Verizon Florida LLC, Defendant, Case No: 08-013358, Circuit Court in and for Hillsborough County, Florida Civil Division, July 21, 2009.
- Declaration of Timothy J. Tardiff on the economics of whether traffic stimulation arrangements violate the prohibition in Section 254(k) of the 1996 Telecommunications Act against noncompetitive services subsidizing competitive services, *ex parte* filing with the Federal Communications Commission on behalf of Qwest Communications International, WC Docket No. 07-135, January 6, 2009.
- Direct Testimony on pole attachment rates prepared for filing on with the West Virginia Public Service Commission on behalf of Verizon, West Virginia, Inc., Case No. 07-1279-E-C (panel testimony), June 4, 2008.
- Counterstatement of Timothy Tardiff and Harold Ware on deregulation of single line retail telephone services, prepared for filing with the Iowa Utilities Board on behalf Iowa Telecom, Docket No. INU-08-1, April 28, 2008.
- Statement of Timothy Tardiff and Harold Ware on deregulation of single line retail telephone services, prepared for filing with the Iowa Utilities Board on behalf Iowa Telecom, Docket No. INU-08-1, March 17, 2008.
- Reply Declaration of Timothy J. Tardiff on reasonable carrier access rates for rural telecommunications carriers, prepared for filing with the Federal Communications Commission on behalf of Qwest Communications International, WC Docket No. 07-135, January 16, 2008.
- Declaration of Timothy J. Tardiff on reasonable carrier access rates for rural telecommunications carriers, prepared for filing with the Federal Communications Commission on behalf of Qwest Communications International, WC Docket No. 07-135, December 17, 2007.
- Reply Expert Report of Dr. Timothy J. Tardiff on interconnection costs and rates," prepared for filing with the Telecommunications Authority of Trinidad and Tobago on behalf of Telecommunications Services of Trinidad and Tobago Limited, Reference No: 4/7/06/4, September 25, 2007.
- Expert Report of Dr. Timothy J. Tardiff on interconnection costs and rates," prepared for filing with the Telecommunications Authority of Trinidad and Tobago on behalf of Telecommunications Services of Trinidad and Tobago Limited, Reference No: 4/7/06/4, August 24, 2007.
- Expert Report of Daniel P. Wikel and Timothy J. Tardiff on airport terminal rental rates, prepared for filing with the Office of the Secretary, United States Department of Transportation on behalf of Tom Bradley International Terminal Airlines, Docket No. OST-2007-28118, April 30, 2007.
- Joint Expert Supplemental Report of Daniel P. Wikel and Timothy J. Tardiff on airport terminal rental rates, prepared for filing with the Office of the Secretary, United States Department of Transportation on behalf of Tom Bradley International Terminal Airlines, Docket No. OST-2007-27331, April 6, 2007.
- Joint Expert Reply Report of Daniel P. Wikel and Timothy J. Tardiff on airport terminal rental rates, prepared for filing with the Office of the Secretary, United States Department of Transportation on behalf of Tom Bradley International Terminal Airlines, Docket No. OST-2007-27331, March 5, 2007.
- Expert Report of Daniel P. Wikel and Timothy J. Tardiff on airport terminal rental rates, prepared for filing with the Office of the Secretary, United States Department of Transportation on behalf of Tom Bradley International Terminal Airlines, Docket No. OST-2007-27331, February 23, 2007.
- Rebuttal Testimony of Timothy Tardiff and Harold Ware on predatory pricing and price discrimination allegations, prepared for filing with the Iowa Utilities Board on behalf Iowa Telecom, Docket No. FCU 06-48, December 1, 2006.
- Rebuttal Testimony of Timothy Tardiff and Harold Ware on predatory pricing and price squeeze allegations, prepared for filing with the Iowa Utilities Board on behalf Iowa Telecom, Docket No. FCU 06-42, August 8, 2006.
- "Response to Digicel's Economic Analysis of Interconnection Costs and Rates," prepared for filing with the Telecommunications Authority of Trinidad and Tobago on behalf of Telecommunications Services of Trinidad and Tobago Limited, Reference No: 4/7/06/1 (with Agustin J. Ros), May 12, 2006.
- "Report on Interconnection Costs in Trinidad and Tobago," prepared for filing with the Telecommunications Authority of Trinidad and Tobago on behalf of Telecommunications Services of Trinidad and Tobago Limited, Reference No: 4/7/06/1 (with Agustin J. Ros), May 4, 2006.

- "Benchmarking Mobile Termination Rates: Evaluation of the .econ Report," prepared for filing with the Telecommunications Authority of Trinidad and Tobago on behalf of Telecommunications Services of Trinidad and Tobago Limited, Reference No: 4/7/06/1 (with Agustin J. Ros), February 10, 2006.
- Rebuttal Testimony of Timothy J. Tardiff on the use price floors for retail services, prepared for filing with the California Public Utilities Commission on behalf of Verizon California, Rulemaking 93-04-003, Investigation 93-04-0002, April 1, 2005.
- Rebuttal Testimony of Timothy J. Tardiff in support of the proposal of Pacific Bell Telephone Company (SBC California) to rebalance NIC Revenues, Rulemaking 03-08-018, March 21, 2005.
- Statement of William Taylor and Timothy Tardiff on alternative intercarrier compensation payment mechanisms for Voice over Internet Protocol long-distance calls, "Analysis of QSI Study," prepared for filing with the Federal Communications Commission on behalf of the United States Telecom Association, Docket No. 03-266, March 4, 2005.
- Panel Rebuttal Testimony of Timothy J. Tardiff, Francis J. Murphy, and Christian M. Dippon on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the California Public Utilities Commission on behalf of Verizon California, Rulemaking 93-04-003, Investigation 93-04-0002, November 9, 2004.
- Reply Declaration of Alfred E. Kahn and Timothy Tardiff on alternative rules for unbundling network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon, WC Docket No. 04-313, October 19, 2004.
- Declaration of Alfred E. Kahn and Timothy Tardiff on alternative rules for unbundling network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon, WC Docket No. 04-313, October 4, 2004.
- Declaration of William E. Taylor, Timothy J. Tardiff, and Harold Ware on the sunset of BOC separate affiliate and related requirements, *ex parte* communication prepared for filing with the Federal Communications Commission on behalf of BellSouth, SBC, and Verizon, WC Docket No. 02-112 and CC Docket No. 00-175, August 10, 2004.
- Reply Testimony of Timothy J. Tardiff on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the California Public Utilities Commission on behalf of Verizon California, Rulemaking 93-04-003, Investigation 93-04-0002, August 6, 2004.
- Supplemental Reply Testimony of Timothy J. Tardiff on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the Washington Utilities and Transportation Commission on behalf of Verizon Northwest, Docket No. UT-023003, June 18, 2004.
- Rebuttal Testimony of Timothy J. Tardiff on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the Washington Utilities and Transportation Commission on behalf of Verizon Northwest, Docket No. UT-023003, May 12, 2004.
- Reply Declaration of Timothy J. Tardiff on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the Washington Utilities and Transportation Commission on behalf of Verizon Northwest, Docket No. UT-023003, April 26, 2004.
- Reply Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Indiana Utility Regulatory Commission on behalf of SBC Indiana, Cause No. 42500, February 13, 2004.
- Direct Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Oklahoma State Corporation Commission on behalf of SBC Oklahoma, Cause No. 200300646, February 11, 2004.
- Rebuttal Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Indiana Utility Regulatory Commission on behalf of SBC Indiana, Cause No. 42500, January 30, 2004.
- Reply Declaration of Howard Shelanski and Timothy Tardiff on the review of rules for pricing unbundled network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon, WC Docket No. 03-173, January 30, 2004.
- Direct Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Indiana Utility Regulatory Commission on behalf of SBC Indiana, Cause No. 42500, January 16, 2004.
- Rebuttal Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Missouri Public Service Commission on behalf of SBC Missouri, Case No. TO-2004-0207 Phase I, January 16, 2004.
- Reply Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the California Public Utilities Commission on behalf of SBC California, Rulemaking 95-04-043, Investigation 95-04-044, January 16, 2004.

- Direct Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Missouri Public Service Commission on behalf of SBC Missouri, Case No. TO-2004-0207 Phase I, December 18, 2003.
- Declaration of Alfred E. Kahn and Timothy Tardiff on the review of rules for pricing unbundled network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon, WC Docket No. 03-173, December 16, 2003.
- Direct Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the California Public Utilities Commission on behalf of SBC California, Rulemaking 95-04-043, Investigation 95-04-044, December 12, 2003.
- Direct Testimony of Timothy J. Tardiff concerning geographic market definition, prepared for filing with the Public Utilities Commission of Ohio on behalf of SBC Ohio, Case No. 03-2040-TP-COI, November 12, 2003.
- Statement of Timothy J. Tardiff on the Commission's Telecommunications Service Obligation (TSO) Model, prepared for filing with the New Zealand Commerce Commission on behalf of Telecom Corporation of New Zealand, May 20, 2003.
- Rebuttal Declaration of Timothy J. Tardiff on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the California Public Utilities Commission on behalf of SBC California, Application Nos. 01-02-024, 01-02-035, 02-02-031, 02-02-032, and 02-03-002, March 12, 2003.
- Reply Declaration of Timothy J. Tardiff on the use of the HAI, Release 5.3 Model for unbundled network elements costs, prepared for filing with the California Public Utilities Commission on behalf of SBC California, Application Nos. 01-02-024, 01-02-035, 02-02-031, 02-02-032, and 02-03-002, February 7, 2003.
- Affidavit of Timothy J. Tardiff on the use of the FCC's Synthesis Model to calculate unbundled network switching and transport prices, prepared for filing with the Regulatory Commission of Alaska, on behalf of Alaska Communications Systems, Docket No. U-96-89, December 20, 2002.
- Declaration of Timothy J. Tardiff in support of the Petition of Verizon for Forbearance From The Prohibition Of Sharing Operating, Installation, and Maintenance Functions Under Section 53.203(a)(2) Of The Commission's Rules, CC Docket No. 96-149, September 24, 2002.
- Affidavit of Timothy J. Tardiff on unbundled network element pricing, prepared for filing with the Federal Communications Commission on behalf of ACS, WC Docket No. 02-201, July 24, 2002.
- Reply Declaration of Alfred E. Kahn and Timothy J. Tardiff in the triennial review of unbundled network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon, CC Docket Nos. 01-338, 96-98, and 98-147, July 17, 2002.
- Statement of Alfred E. Kahn and Timothy J. Tardiff on funding the telecommunications service (universal service) obligation, prepared for filing with the New Zealand Commerce Commission on behalf of Telecom Corporation of New Zealand, June 10, 2002.
- Supplemental Surrebuttal Testimony of Timothy Tardiff and Francis Murphy on the use of the FCC's Synthesis Model for evaluating the costs of unbundled network elements, prepared for filing with the Florida Public Service Commission on behalf of Verizon-Florida, Docket No. 990649B-TP, April 22, 2002.
- Surrebuttal Testimony of Timothy Tardiff and Francis Murphy on the use of the FCC's Synthesis Model for evaluating the costs of unbundled network elements, prepared for filing with the Florida Public Service Commission on behalf of Verizon-Florida, Docket No. 990649B-TP, March 18, 2002.
- Surrebuttal Testimony of Howard Shelanski and Timothy Tardiff on economic principles for determining the costs of unbundled network elements, prepared for filing with the Pennsylvania Public Utility Commission on behalf of Verizon-Pennsylvania, Docket No. R-00016683, February 8, 2002.
- Surrebuttal Testimony of Timothy J. Tardiff and Joseph A. Gansert on the application of the Modified Synthesis Model for the costs of unbundled network elements, prepared for filing with the Pennsylvania Public Utility Commission on behalf of Verizon-Pennsylvania, Docket No. R-00016683, February 8, 2002.
- Rebuttal Testimony of Howard Shelanski and Timothy Tardiff on economic principles for determining the costs of unbundled network elements, prepared for filing with the Pennsylvania Public Utility Commission on behalf of Verizon-Pennsylvania, Docket No. R-00016683, January 11, 2002.
- Rebuttal Testimony of Timothy J. Tardiff on the application of the Modified Synthesis Model for the costs of unbundled network elements, prepared for filing with the Pennsylvania Public Utility Commission on behalf of Verizon-Pennsylvania, Docket No. R-00016683, January 11, 2002.
- Declaration of Alfred E. Kahn and Timothy J. Tardiff submitted to the U.S. Federal Communications Commission on behalf of Verizon regarding broadband regulation, December 18, 2001.
- Supplemental Rebuttal Testimony of Timothy J. Tardiff on the application of the Modified Synthesis Model for the costs of unbundled network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon-Virginia, CC Docket Nos. 00-218, 00-249, and 00-251, November 16, 2001.

- Declaration of Timothy J. Tardiff on the use of the HAI, Release 5.2a for deriving an unbundled switch cost reduction, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, October 30, 2001.
- Declaration of Timothy J. Tardiff on the use of the HAI, Release 5.2a for deriving an unbundled loop cost reduction, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, October 19, 2001.
- Surrebuttal Testimony of Howard Shelanski and Timothy J. Tardiff on economic principles for determining the costs of unbundled network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon-Virginia, CC Docket Nos. 00-218, 00-249, and 00-251, September 21, 2001.
- Rebuttal Testimony of Timothy J. Tardiff on the application of the Modified Synthesis Model for the costs of unbundled network elements, prepared for filing with the Maryland Public Service Commission on behalf of Verizon-Maryland, Case No. 8879, September 5, 2001.
- Declaration of Timothy J. Tardiff on the use of the HAI, Release 5.2a and Modified Synthesis Models for unbundled loop and switch costs, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, September 4, 2001.
- Rebuttal Testimony of Timothy J. Tardiff on the application of the Modified Synthesis Model for the costs of unbundled network elements, prepared for filing with the Federal Communications Commission on behalf of Verizon-Virginia, CC Docket Nos. 00-218, 00-249, and 00-251, August 27, 2001.
- Affidavit of Timothy J. Tardiff on the use of proxy costs models for unbundled network elements, prepared for filing with the Regulatory Commission of Alaska, on behalf of Alaska Communications Systems, Docket No. U-96-89, July 27, 2001.
- Rebuttal Testimony of Timothy J. Tardiff on the application of the Hatfield Model for the costs of unbundled network elements, prepared for filing with the Massachusetts Department of Telecommunications and Energy on behalf of Verizon-Massachusetts, Docket No. D.T.E. 01-20, July 18, 2001.
- Rebuttal Testimony of Timothy J. Tardiff on the application of the Hatfield Model for the costs of unbundled network elements, prepared for filing with the New Jersey Board of Public Utilities on behalf of Verizon-New Jersey, Docket No. TO00060356, October 12, 2000.
- Supplemental Rebuttal Testimony of Timothy J. Tardiff on the Hatfield Model of unbundled network elements, prepared for filing with the State of Maine Public Utilities Commission on behalf of Bell Atlantic-Maine, Case No. 97-505, October 10, 2000.
- Public Interest Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications Inc. Nevada Bell Telephone Company and Southwestern Bell Communications Services, Inc. d/b/a Nevada Bell Long Distance for Provision of In-Region InterLATA Services in Nevada (with Alfred E. Kahn), July 24, 2000.
- Responsive Testimony on the HAI Model of unbundled network elements, prepared for filing with the New York Public Service Commission on behalf of Bell Atlantic-New York, Case 98-C-1357 (filed as part of panel testimony), June 26, 2000.
- Affidavit of Timothy J. Tardiff on avoided cost discounts for wholesale services, prepared for filing with the Regulatory Commission of Alaska, on behalf of Alaska Communications Systems, Docket Nos. U-99-141, U-99-142 and U-99-143, April 17, 2000.
- Third Affidavit of Timothy J. Tardiff on costs models for unbundled network elements, prepared for filing with the Regulatory Commission of Alaska, on behalf of Alaska Communications Systems, Docket Nos. U-99-141, U-99-142 and U-99-143, March 24, 2000.
- Second Affidavit of Timothy J. Tardiff on costs models for unbundled network elements, prepared for filing with the Regulatory Commission of Alaska, on behalf of Alaska Communications Systems, Docket Nos. U-99-141, U-99-142 and U-99-143, February 25, 2000.
- Rebuttal Testimony of Timothy J. Tardiff on collocation costs models, prepared for filing with the Delaware Public Service Commission on behalf of Bell Atlantic-Delaware, Docket No. 99-251, February 24, 2000.
- Affidavit of Timothy J. Tardiff on costs models for unbundled network elements, prepared for filing with the Regulatory Commission of Alaska, on behalf of Alaska Communications Systems, Docket Nos. U-99-141, U-99-142 and U-99-143, February 11, 2000.
- Public Interest Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications Inc. Southwestern Bell Telephone Company and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region InterLATA Services in Texas (with Alfred E. Kahn), January 10, 2000.

- Rebuttal Testimony of Timothy J. Tardiff on collocation costs models, prepared for filing with the Pennsylvania Public Utility Commission on behalf of Bell Atlantic-Pennsylvania, Docket Nos. R-00994697 and R-00994697C0001, December 21, 1999.
- "Relaxed Regulation of High Capacity Services in Phoenix and Seattle: The Time is Now," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petitions of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Phoenix and Seattle MSAs (with Alfred E. Kahn), July 21, 1999.
- Rebuttal Testimony of Timothy J. Tardiff on the HAI Model of unbundled network elements, prepared for filing with the Pennsylvania Public Utility Commission on behalf of Bell Atlantic-Pennsylvania, Docket Nos. P-00991648 and P-00991649, June 15, 1999.
- "High Capacity Competition in Seattle: Reply to Comments of Intervening Parties," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petition of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Seattle, Washington MSA (with Alfred E. Kahn), March 10, 1999.
- Rebuttal Testimony of Timothy J. Tardiff on collocation costs models, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, February 8, 1999.
- Surrebuttal Testimony of Alfred E. Kahn and Timothy J. Tardiff filed with the Missouri Public Service Commission, in support of the Applications of SBC Communications, Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc., for Provision of In-Region InterLATA Services in Missouri, Docket No. TO 99-227, February 4, 1999.
- Rebuttal Testimony of Timothy J. Tardiff on the HAI Model of unbundled network elements, prepared for filing with the Rhode Island Public Utilities Commission on behalf of Bell Atlantic-Rhode Island, Docket No. 2681, January 15, 1999.
- Reply Testimony of Timothy J. Tardiff on collocation costs models, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, January 11, 1999.
- "Economic Evaluation of High Capacity Competition in Seattle," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petition of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Seattle, Washington MSA (with Alfred E. Kahn), December 22, 1998.
- Testimony of Timothy J. Tardiff on collocation costs models, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, December 18, 1998.
- "Measuring and Recovering the Costs of Long-Term Number Portability: Implications of Price Cap Regulation," Prepared for Southwestern Bell for presentation to the Federal Communications Commission, December 10, 1998.
- Direct Testimony of Alfred E. Kahn and Timothy J. Tardiff, filed with the Missouri Public Service Commission, in support of the Applications of SBC Communications, Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc., for Provision of In-Region InterLATA Services in Missouri, Docket No. TO 99-227, November 20, 1998.
- "High Capacity Competition in Phoenix: Reply to Comments of Intervening Parties," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petition of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Phoenix, Arizona MSA (with Alfred E. Kahn), October 28, 1998.
- "Measuring and Recovering the Costs of Long-Term Number Portability," Prepared for Southwestern Bell for presentation to the Federal Communications Commission, October 28, 1998 (with Alfred E. Kahn).
- Declaration of Timothy J. Tardiff on the economic impacts of separate subsidiary requirements for the offer of advanced services by incumbent local exchange carriers, prepared for filing with the Federal Communications Commission on behalf of Bell Atlantic, in the matter of Deployment of Wireline Services Offering Advanced Telecommunications Capability, October 15, 1998.
- "An Analysis of the HAI Model Release 5.0a," Rebuttal Testimony filed with the Florida Public Service Commission, Docket No. 980696-TP, on behalf of GTE Florida, September 2, 1998 (with Gregory M. Duncan, Karyn E. Model, Christian M. Dippon, Jino W. Kim, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
- "Economic Evaluation of High Capacity Competition in Phoenix," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petition of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Phoenix, Arizona MSA (with Alfred E. Kahn), August 14, 1998.

- Rebuttal Testimony of Timothy J. Tardiff on the HAI Model of unbundled network elements, prepared for filing with the New Hampshire Public Utilities Commission on behalf of Bell Atlantic-New Hampshire, Docket No. DE-97-1171, June 22, 1998.
- Rebuttal Affidavit before the Arkansas Public Service Commission in the matter of the Application of Southwestern Bell Telephone Company Seeking Verification that It Has Fully Complied with and Satisfied the Requirements of Section 271 (c) of the Telecommunications Act of 1996 (with Alfred E. Kahn), June 11, 1998.
- Rebuttal Testimony before the State Corporation Commission of the State of Kansas in the matter of Southwestern Bell Telephone Company – Kansas' Compliance With Section 271 of the Federal Telecommunications Act of 1996, Docket No. 97-SWBT- 411-GIT (with Alfred E. Kahn), May 27, 1998.
- Rebuttal Affidavit Before the Public Utilities Commission of the State of California in support of Pacific Bell's Draft Application for Authority to Provide InterLATA Services in California (with Alfred E. Kahn), May 20, 1998.
- "An Analysis of the Hatfield Model Release 4.0," prepared for filing with the California Public Utilities Commission on behalf of GTE California, May 1, 1998 (with Gregory M. Duncan, Karyn E. Model, Christian M. Dippon, Jino W. Kim, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
- Reply Testimony of Timothy J. Tardiff on unbundled network element prices and retail service price floors, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, April 27, 1998.
- Rebuttal Testimony of Alfred E. Kahn and Timothy J. Tardiff filed with the Oklahoma Public Service Commission, in support of the Applications of SBC Communications, Inc., Southwestern Bell Telephone Company, and Southwestern Bell Communications Services, Inc., for Provision of In-Region InterLATA Services in Oklahoma, Case No. PUD 970000560, April 21, 1998.
- Reply Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications Inc. Southwestern Bell Telephone Company and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region InterLATA Services in Texas (with Alfred E. Kahn), April 17, 1998.
- Testimony of Timothy J. Tardiff on unbundled network element prices and retail service price floors, prepared for filing with the California Public Utilities Commission on behalf of Pacific Bell, April 8, 1998.
- Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications Inc., Pacific Bell, and Pacific Bell Communications for Provision of In-Region InterLATA Services in California (with Alfred E. Kahn), March 31, 1998.
- "Economic Principles Governing Measurement of Nonrecurring/OSS Costs: An Analysis of the AT&T/MCI Recommendations," prepared for filing with the California Public Utilities Commission on behalf of GTE California and Pacific Bell, March 4, 1998 (with Gregory M. Duncan).
- "Analysis of the Hatfield Model Release 5.0a," Rebuttal Testimony filed with the North Carolina Utilities Commission, Docket No. P-100, Sub 133d, on behalf of GTE South, March 2, 1998 (with Gregory M. Duncan, Rafi A. Mohammed, Christian M. Dippon, Aniruddha Banerjee, Karyn E. Model, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
- "Analysis of the Hatfield Model Release 5.0a," Rebuttal Testimony filed with the South Carolina Public Service Commission, on behalf of GTE South, March 2, 1998 (with Gregory M. Duncan, Rafi A. Mohammed, Christian M. Dippon, Aniruddha Banerjee, Karyn E. Model, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
- Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications Inc. Southwestern Bell Telephone Company and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region InterLATA Services in Texas (with Alfred E. Kahn), March 2, 1998.
- "Analysis of the Hatfield Model Release 5.0a," Rebuttal Testimony filed with the Kentucky Public Service Commission, on behalf of GTE South, February 26, 1998 (with Gregory M. Duncan, Rafi A. Mohammed, Christian M. Dippon, Aniruddha Banerjee, Karyn E. Model, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
- Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications Inc. Southwestern Bell Telephone Company and Southwestern Bell Communications Services, Inc. d/b/a Southwestern Bell Long Distance for Provision of In-Region InterLATA Services in Arkansas (with Alfred E. Kahn), February 24, 1998.
- Testimony before the State Corporation Commission of the State of Kansas in the matter of Southwestern Bell Telephone Company – Kansas' Compliance With Section 271 of the Federal Telecommunications Act of 1996, Docket No. 97-SWBT- 411-GIT (with Alfred E. Kahn), February 17, 1998.
- "Analysis of the Hatfield Model Release 5.0," Rebuttal Testimony filed with the Alabama Public Utilities Commission, on behalf of GTE South, February 13, 1998 (with Gregory M. Duncan, Rafi A. Mohammed,

- Christian M. Dippon, Aniruddha Banerjee, Karyn E. Model, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
- Affidavit before the Federal Communications Commission in the matter of Application of SBC Communications, Inc. Southwestern Bell Telephone Company and Southwestern Bell Communications Services, Inc. d/b/a/ Southwestern Bell Long Distance for Provision of In-Region InterLATA Services in Oklahoma (with Alfred E. Kahn), February 13, 1998.
 - "Analysis of the Hatfield Model Release 5.0," Rebuttal Testimony filed with the North Carolina Utilities Commission, Docket No. P-100, Sub 133b, on behalf of GTE South, January 30, 1998 (with Gregory M. Duncan, Rafi A. Mohammed, Christian M. Dippon, Aniruddha Banerjee, Karyn E. Model, Francis J. Murphy, Robert P. Cellupica, and Thomas F. Guarino).
 - Supplemental Rebuttal Testimony of Timothy J. Tardiff on switching costs, prepared for filing with the State of Maine Public Utilities Commission on behalf of Bell Atlantic-Maine, Case No. 97-505, December 22, 1997.
 - "Reply to AT&T Recommendations for Regulatory Treatment of OSS Costs," prepared for filing with the California Public Utilities Commission on behalf of GTE California and Pacific Bell, December 15, 1997 (with Gregory M. Duncan).
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OTHER POSITIONS HELD:

2008 – Present Board of Academic Advisors, The Free State Foundation.

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- 2005 – Present Regulatory Framework Working Group, Digital Age Communications Act (DACA) Project, Progress and Freedom Foundation.
- 2004 – 2005 Chairperson, Site Council, Frank V. Bergman Elementary School.
- 2003 – Present Advisory Board, The Institute for Regulatory Law and Economics.
- 2003 – Present Executive Committee, Global Communications Strategy Forum.
- 2002 – 2003 Guest Editor, Symposium on Incentive Regulation, *The Review of Network Economics*, Vol. 2(4), December 2003.
- 2000 - 2003 Dean's Advisory Council On Tenure and Promotion in Arts and Sciences.
- 1998 - 2005 Associated Faculty Member, Center For Research In Regulated Industries, Rutgers University.
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Review of Blackmon’s Incentive Regulation and the Regulation of Incentives, *Review of Industrial Organization*, Vol. 11, No. 4, August 1996, pp. 563-566.

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“Guest Editor’s Foreword.” Symposium Commemorating the Contributions of Alfred E. Kahn. *The Review of Network Economics*, Vol. 7(4), December 2008, pp. 448-459 (with T. Tardiff).

“On Market Power and the Power of Markets: A Schumpeterian View of Dynamic Industries.” The Free State Foundation, *Perspectives from FSF Scholars*, February 26, 2008, Vol. 3(5). http://www.freestatefoundation.org/images/Power_of_Markets.pdf.

“Guest Editor’s Foreword.” Symposium on Incentive Regulation. *The Review of Network Economics*, Vol. 2(4), December 2003, pp. 287-288.

WORK IN PROGRESS:

“Subsidy-Free Prices and Scope Economies.”

“Why Retaining Racial Preferences in College Admissions May Yield a More-Able Student Body.” (with D. Li).

“Good-Kid, Bad-Kid Equilibria with Parental Concave Utility.”

WORK IN PROGRESS (CONTINUED):

“Predatory Inference in Markets with Demand Complementarities.”

“Productivity Growth and Merger Efficiencies in the U.S. Telecommunications Industry.”
(with Y. Gao, D. Seo and A. Featherstone).

“Effective Market Shares and Antitrust.”

“An Essay On The Art and Science of Teaching.”

“Market Power and the Power of Markets for U.S. Broadband Services.” (with T. Hazlett)

“Microeconomics for Business and Public Policy.”

TESTIMONY AND AFFIDAVITS:

Arkansas Public Service Commission

California Public Utilities Commission

Canadian Radio-Television and Telecommunications Commission

Colorado Public Utilities Commission

Federal Communications Commission

Kansas Corporation Commission

Kansas State Legislature (Commerce Committee)

Missouri Public Service Commission

Texas Public Utilities Commission

United States Court of Appeals for the District of Columbia

United States Supreme Court (Research Citation)

INVITED PRESENTATIONS:

“Properly Structured Incentive Plans.” Missouri Public Service Commission, Electric Roundtable Discussion Group. Jefferson City, Missouri, December 2001.

“Regulatory Moral Hazard: Price Caps and Endogenous Entry Under the 1996 Telecommunications Act.” Competitive Entry In Regulated Industries. Center For Research In Regulated Industries, Rutgers University, Newark, New Jersey, May 2000.

“The Telecommunications Act of 1996: The ‘Costs’ of Managed Competition.” American Enterprise Institute, Washington D.C., September 1999 (with D. Lehman).

“Vertical Integration and Exclusionary Behavior in Network Industries.” The Rutgers University 12th Annual Western Conference of the Advanced Workshop In Regulation and Competition, San Diego, California, July 1999.

“The Political Economy of Price Cap Regulation.” The Rutgers University 11th Annual Western Conference of the Advanced Workshop In Regulation and Competition, Monterey, California, July 1998.

“Regulation and Common Costs: Estimation versus Allocation – A Discussion.” Pricing and Costing A Competitive Local Telecommunications Network. American Enterprise Institute, Washington D.C., November 1997.

“Does Tighter Price Cap Regulation Increase Consumer Welfare?” The Rutgers University 10th Annual Western Conference of the Advanced Workshop In Regulation and Public Utility Economics, San Diego, California, July 1997.

“Competition, Incentive Regulation, and Strategic Behavior Under The 1996 Telecommunications Act.” Utility Regulation And Strategy: The Basics Revisited. Conference sponsored by the Public Utility Research Center at the University of Florida, Gainesville, Florida, February 1997.

“Competitive Incentives of Vertically Integrated Local Exchange Carriers.” Twenty-Third Annual Telecommunications Policy Research Conference. Solomons, Maryland, October 1995; and The Rutgers University 9th Annual Western Conference of the Advanced Workshop In Regulation and Public Utility Economics, San Diego, California, July 1996.

“Seven Myths About Incentive Regulation.” Pricing and Regulatory Innovations Under Increasing Competition. Conference sponsored by the Center for Research in Regulated Industries, Rutgers University, Newark, New Jersey, October 1995.

INVITED PRESENTATIONS (CONTINUED):

“Strategic Behavior of the Vertically Integrated Firm: The Case of RBOC Entry Into InterLATA Long Distance.” The Rutgers University 8th Annual Western Conference of the Advanced Workshop In Regulation and Public Utility Economics, San Diego, California, July 1995.

“The Promise and Pitfalls of Incentive Regulation.” Market and Technological Convergence: Implications For Regulation. Conference sponsored by the Public Utility Research Center at the University of Florida, Gainesville, Florida, April 1995.

“Potential Pitfalls in Empirical Investigations of the Effects of Incentive Regulation Plans in The Telecommunications Industry.” Telecommunications Infrastructure and the Information Economy: Interaction Between Public Policy and Corporate Strategy. Conference sponsored by the School of Business at the University of Michigan, Ann Arbor, Michigan, March 1995.

“Designing Incentive Regulation For The Telecommunications Industry.” American Enterprise Institute, Washington D.C., March 1995 (with D. Sappington).

British Broadcasting Corporation (BBC) Radio Interview with Dan Corry of the Institute For Public Policy Research, London, England. Documentary. “Analysis: The Regulatory State?” October 23, 1994.

“Designing Carrier of Last Resort Obligations.” The Rutgers University 7th Annual Western Conference of the Advanced Workshop in Regulation and Public Utility Economics, San Diego, California, July 1994.

“Incentive Regulation: Lessons From Telecommunications.” Innovative Incentive Rate Regulation for a Competitive Electric Utility Industry. Conference co-sponsored by the Center for Regulatory Studies and the Institute of Government and Public Affairs. Chicago, Illinois, April 1994.

“Why Less May Be More Under Price Cap Regulation.” Twenty-First Annual Telecommunications Policy Research Conference. Solomons, Maryland, October 1993; and The Rutgers University 12th Annual Eastern Conference of the Advanced Workshop in Regulation and Public Utility Economics, Brewster, Cape Cod, Massachusetts, May 1993.

“Managed Competition In Telecommunications.” Regulation and Planning In A Market Economy. Conference sponsored by the Public Utility Research Center, University of Florida. Gainesville, Florida, April 1993.

INVITED PRESENTATIONS (CONTINUED):

“Cross-Subsidization and Price Predation in Public Enterprise;” and “Incentive Regulation: Theory and Practice.” Southeastern Regional Business and Economics Utilities Conference, Atlanta, Georgia, September 1991.

“Post-Divestiture Pricing Trends In The Telecommunications Industry.” Divestiture: Five Years Later. Conference sponsored by the Center for Telecommunications and Information Studies at Columbia University, Washington, D.C., March 1989.

“The Impact of Telecommunications Regulation On The Economic Incentives of Private Network Deployment.” National Communications Forum, Chicago, Illinois, October 1988.

“Protecting The Right To Be Served By Regulated Utilities Subject To Competition: A Critical Assessment.” 11th World Engineering Congress, Atlanta, Georgia, October 1988.

“Default Capacity Tariffs: Smoothing The Transitional Regulatory Asymmetries In The Telecommunications Marketplace.” Fifteenth Annual Telecommunications Policy Research Conference, Airlie, Virginia, November 1987.

“Traffic Sensitive Costs, Bypass and Pricing For Carrier of Last Resort.” Bell Communications Research Conference on Traffic Sensitive Cost Recovery. Seattle, Washington, July 1986.

“Forecasting Bypass Adoption In Telecommunications.” National Forecasting Conference, Denver, Colorado, June 1985.

“A General Theory of Point-to-Point Long Distance Demand.” Bell Communications Research Business Research Conference, Durango, Colorado, October 1984.

HONORS, AWARDS, AND GRANTS:

- | | |
|-------------|---|
| 2008 | MBA Student’s Professor of the Semester (First Time Award Presented to a Faculty Member Outside the College of Business Administration) |
| 2004 – 2005 | Center for Applied Economics Grant (Principal Investigator) |
| 2004 | Edgar S. Bagley Research Award |
| 2001 | Edgar S. Bagley Research Award |

HONORS, AWARDS, AND GRANTS (CONTINUED):

- | | |
|-------------|---|
| 1999 – 2000 | American Enterprise Institute Grant (Co-Principal Investigator) |
| 1996 | William L. Stamey Teaching Award |
| 1995 | Edgar S. Bagley Research Award |
| 1993 | First-Place In Graduate Student Paper Competition, Twenty-First Annual Telecommunications Policy Research Conference |
| 1990 – 1993 | Florida Public Service Commission Grant to the Public Utility Research Center at the University of Florida (Co-Principal Investigator) |
| 1984 – 1993 | Designated Very High Potential Manager, SBC Communications |
| 1991 | First-Place In Paper Competition sponsored by Public Utilities Reports, Inc., Southeastern Business and Economics Utilities Conference (with S. Berg) |
| 1991 | University of Florida Research Fellowship |
| 1989 | Management Stock Award, Southwestern Bell Corporation |
| 1979 | B.A. Conferred with High Honors |
| 1971 | Eagle Scout Award |

EDITORIAL BOARDS:

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|----------------|----------------------------------|
| 2003 – Present | The Review of Network Economics |
| 1997 – Present | Journal of Regulatory Economics |
| 1996 – Present | Information Economics and Policy |

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Addison-Wesley
American Economic Review
Applied Stochastic Models in Business and Industry
Cambridge University Press
Contemporary Economic Policy
Eastern Economic Journal
Economic Inquiry
Economics Letters
Edward Elgar Publishing
Empirical Economics
Encyclopedia of Energy Engineering and Technology
Energy Studies Review
Information Economics and Policy
International Economics and Economic Policy
International Journal of Industrial Organization
International Tax and Public Finance
Journal of Competition Law & Economics
Journal of Economic Behavior and Organization
Journal of Economic Education
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Journal of Industrial Economics
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Journal of Productivity Analysis
Journal of Regulatory Economics
Kluwer Academic Publishers
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Review of Industrial Organization
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The Energy Journal
The Journal of Law, Economics, & Organization
The Review of Economics and Statistics
The Review of Network Economics
World Scientific