

Potential difficulties with applying the various benchmark alternatives are discussed below. The point is not that the benchmarks are invalid. Rather, the potential difficulties are raised so that adjustments can be made. For example, if qualitative factors suggest that the benchmark rates are too low, the Commission can adjust the percentage deviation from the benchmark that would be considered unreasonable.

1. Rates Charged by Systems Facing Effective Competition

Under this approach to benchmarking, the Commission would identify the systems that currently meet the criteria for effective competition as defined in the 1992 Cable Act and use rates charged by those systems as the benchmark for rates charged by systems not subject to effective competition. More precisely, the "control" or effectively competitive firms would provide a range of benchmarks depending on the individual system characteristics. For example, effectively competitive systems of a particular size and using a particular mix of technology would provide the benchmark for similarly situated regulated firms.

In principle, this technique can provide a useful benchmark (or set of benchmarks). However, some caveats must be mentioned. First, the existing set of systems that meet the "effective competition" standard in the Act may not in reality be effectively competitive. Consider first overbuild systems. These systems, or at least some of them, may not be in a market equilibrium. If the competing systems are attempting to grow to an efficient size by heavy discounting, the observed rates may be below those that would be observed in a true

competitive equilibrium. Similarly, the less than 30 percent penetration standard may lead to benchmark rates that are too high if costs are high due to low penetration. These factors should be analyzed prior to adopting this safeguard.

Second, marketing practices in the industry appear to vary substantially among systems. For example, some systems have a very robust basic tier that includes a large number of satellite channels while others have smaller basic tiers that already reflect to some degree the basic channel line-up contemplated by the 1992 Act. Similarly, some systems discount installation or bundle certain equipment while others do not. Adjustments will have to be made in the data collected to ensure that rate comparisons are valid. One such adjustment that would be necessary is to establish the benchmark on a per channel basis.

b. Past Regulated Rates

Under this benchmarking approach, 1986 rates would be assumed reasonable because they were generated under franchise agreements or continuing rate regulation prior to the full effect of the 1984 Cable Act. As was true in the case of the "effective competition" benchmark, a way must be found to compare similar systems with similar systems by identifying critical cable television service cost drivers. In addition, some way must be found to adjust the 1986 rates upwards to reflect reasonable cost changes since 1986.

Several comments on this approach are in order:

- In any new business, there is a tendency in the introductory period to price at low levels to stimulate interest in the new product. The period 1984 through 1986 was one of relatively high growth compared to the present.
- Franchise agreements may have specifically required low price or subsidized basic service with an understanding that pricing of equipment or other services could be used to recover deficits.
- Regulation prior to the effectiveness of the 1984 Act may have overly constrained basic cable pricing. Certainly one of the issues in play at the time cable deregulation was considered in 1984 was the possibility that cable rate regulation was too tight.³³ If true, the 1986 rates would be too low to serve as an unadjusted benchmark.

Second, the proper inflation adjustment for rates is an index of cable system costs. Such an index apparently does not exist, and to build one might require a great deal of effort. The CPI or PPI do not seem to be adequate substitutes for such an index. Cable programming expenses constitute as much as 30 percent of the basic revenues of an average cable system.³⁴ These expenses have been rising substantially along with entertainment input costs in general. Exhibit II shows how cable programming entertainment input costs and the costs of related activities have risen in recent years. As the Exhibit demonstrates, cable programming costs, and the costs of related entertainment inputs, have risen dramatically faster than the overall price level since 1984.

³³ Perhaps one of the reasons Commission guidelines are required for local rate regulation in the 1992 Act, might be that there is a Congressional concern that this problem might reappear.

³⁴ See Paul Kagan Associates, Inc., Cable TV Programming, March 27, 1992.

EXHIBIT II

PROXIES FOR PROGRAMMING COST INCREASES 1986-1992

CPI ^a	27.51%
Admissions ^b	37.44
Average Professional Baseball Salary* ^c	44.79
Average Professional Football Salary* ^d	76.77
Average Movie Production Cost ^{ef}	92.59
Top Male Star (per movie) ^{gh}	100.00
Average Professional Basketball Salary* ⁱ	117.87
Aggregate Network License Fees ^j	130.94
Top Recording Star (per album) ^{kl}	166.00
Top Female Star (per movie) ^{mn}	200.00
World Heavyweight Champion (per fight) ^o	385.71

*1990 data

Sources:

- a Bureau of Labor Statistics, CPI Detailed Report, Data for August 1992 (August 1992), p. 70.
- b Id., p. 74.
- c Bureau of the Census, Statistical Abstract of the United States 1991 (1991), p. 239.
- d Id.
- e "Leading U.S. Distributors' Film Budgets," Daily Variety (July 2, 1986), p.5.
- f "Even the Late-Summer Pickup in Movie Biz Won't Save Blah Season," The Los Angeles Business Journal (August 24, 1992), Sec. 1, p. 1.
- g "Film Talk," The Washington Post (April 11, 1986).
- h "Eddie Murphy: He's back and he's bad; New film tries to recapture 'old funniness'," The Houston Chronicle, (November 29, 1992) Zest, p. 11.
- i Bureau of the Census, p. 239.
- j Paul Kagan Associates, Cable TV Programming (March 27, 1992), p. 1.
- k "CBS Records: Dominant, Lucrative and Troubled," Los Angeles Times, (February 1, 1987) Business section, Part 4, p. 1, column 2.
- l "To the Tune of \$60 Million," Newsday (December 15, 1992), p. 3.
- m Cox, Yvonne, Maclean's (November 3, 1986).
- n "Streisand to Unveil \$60 Million Deal with Sony," The Reuter Library Report (December 15, 1992).
- o "Wheeling, Dealing with the 'Real Deal'," The San Francisco Chronicle (February 21, 1992), p. 30.

One alternative to a specific cable industry cost index would be to develop a rough approximation by using a cable entertainment price index together with the CPI, weighted by an industry average estimate of expenditures. This would have the attraction of at least providing a better estimate of actual cost experience in the cable industry since deregulation than the simple use of the CPI.³⁵

Third, As discussed in Section I, quality has improved substantially between 1986 and 1992. These improvements in quality generally do not come free. Investment in new, more reliable plant, improved telephone and billing systems, and the addition of repair and customer service personnel have been undertaken by many systems. Simple comparisons of 1986 and 1993 prices would not reflect this improvement, thus penalizing cable industry members that have improved their performance and programming. In other words, quality-adjusted rate increases between 1986 and 1992 are lower than nominal rate increases.

Fourth, the product mix has changed substantially since 1986. Simple rate per channel comparisons between 1986 and 1992 may not reflect these changes. In general, price per channel in the industry tends to fall as the number of channels on a system increases.³⁶ To take one example, some systems, such as

³⁵ In the common carrier area, the Commission is using the PPI rather than a telephone industry specific inflation factor for purposes of inflating rates on a going-forward basis, which presents analytically similar issues. However, in the telephone case, there is no one single quantitatively significant input cost that is rising to the same degree that programming expenses are rising for cable.

³⁶ This inverse relationship between rate per channel and number of channels reflects economically efficient pricing of cable service. Many significant cable
(continued...)

many owned by Time Warner have already retired their programs to offer what is essentially a basic broadcast product. A comparison of 1986 rates per channel and 1993 rates per channel would show larger percentage increases than would have been shown if Time Warner had not retired. On the other hand, systems that continue to bundle cable programming channels with basic broadcasting channels would show smaller percentage increases. Indeed, to the extent these systems have added channels to the basic tier as system capacity has increased and new satellite channels have become available, this effect would be exacerbated.

The Commission requests comments on how construction and rebuild costs should be accounted for under this type of adjustment mechanism. The short answer is that it will be most difficult to do so without generating many of the problems that lead the Commission to reject rate of return regulation. Under the

³⁶(...continued)

system costs do not vary directly with capacity. It is appropriate that fixed system costs be recovered from users of the basic tier of service. Some operators may choose to discount basic service in order to stimulate subscription and thereby increase the potential number of customers available to purchase cable programming or premium services. This is a conscious marketing choice that operators should be free to exercise. Government mandated subsidies are another matter.

The 1992 Cable Act specifically mentions that cable programming prices should not be based on an incremental assignment of cable system costs. However, many of the fixed system costs described above are indeed directly assignable, in an economic sense, to the basic tier and are appropriately recovered from basic subscribers. For example, if consumers are only required to purchase basic service, then the costs of establishing and maintaining a customer account, the cost of the drop, and the cost of building and operating a system with the capacity to provide basic service are directly assignable to basic service customers.

assumption that benchmark rates will be based on a per channel basis, this problem is somewhat mitigated. Cable systems will be compensated for the costs of system expansion through the ability to sell more (and presumably higher quality) cable programming service channels to consumers.

c. Average Rates of Cable Systems

Under this alternative, rates would be considered reasonable as long as they did not exceed the average existing rate by more than a certain percentage. Presumably there would be some sorting of firms based on significant cost drivers as contemplated in the previous benchmarking approaches that were discussed. This form of benchmarking would allow identification of the industry "outliers," *i.e.*, those with extremely high rates compared to other similarly situated companies.

As noted by the Commission, one benefit of this approach is that it might be easy to implement. The Commission, however, raises the possibility that the average itself might be too high in some sense (reflecting the conditions that the Congress intended to address with passage of the 1992 Cable Act). However, even if this is correct, this approach might be used as a stopgap measure during the time it takes to evaluate, select and implement an alternative approach.

There may be circumstances under which this approach could even be used as the long run approach to basic service regulation. Most cable operators are likely to choose to re-tier their services into a basic broadcast component and cable programming components. If a significant number of subscribers are served by

systems that face significant over the air competition for basic broadcast tier signals, the average for the entire distribution of prices may not differ substantially from the competitive level. Therefore, establishing a benchmark based on this new distribution may provide satisfactory results.

d. Price Caps

Under any of the alternatives discussed above, once the initial benchmark is selected, there must be some way to adjust prices over time. The Commission suggests a price cap mechanism similar to that used in the common carrier area as an alternative. As discussed earlier, the price cap approach adopted for the local exchange carriers necessarily retains significant elements of rate of return regulation and is therefore inappropriate for the cable industry. Perhaps to distinguish common carrier price caps from whatever approach is adopted for the cable industry, the latter should be referred to as "rate adjustment formulas." In any event, the requirement to adjust rates over time raises many of the issues discussed in connection with a benchmark based on prior regulated rates. A rate adjustment formula based on the weighted average of an entertainment index and a general inflation index such as the PPI would seem to be appropriate.³⁷

The NPRM raises the issue of how additions to, or deletions from, the basic tier should be treated under a rate adjustment mechanism. Specifically, the Com-

³⁷ The entertainment index adjustment may be less important if the basic service tier does not include satellite programming services. If there are such channels on the tier, then perhaps the adjustment index should be weighted by the number of satellite channels rather than by a typical system cost structure.

mission asks whether a short term adjustment based on incremental costs can be used to gauge the reasonableness of such changes. This standard is used by the Commission to evaluate new product offerings under local exchange carrier price caps. A cost test for such changes in the common carrier area is indeed necessary due to the high degree of market power enjoyed by local telephone companies and the competitive risks raised by giving them too much pricing discretion.³⁸ Such a test would be unnecessary in the context of cable regulation. The cross-subsidy concerns present in the telephone industry will not be present in the case of cable. At least up to a point, adding channels at the per channel benchmark rate can be presumed to be reasonable.

The competition and average rate benchmarks would not necessarily require a rate adjustment mechanism. In both cases, adjustments could be made each year by simply recomputing the benchmark using the methodology originally used. This solution might work particularly well for the average rate benchmark since it would be relatively simple. There might be theoretical concerns about cable companies gaming the adjustment process by raising rates simply to get the average up. However, if on average the current rates are both reasonable from an efficiency point of view and profit maximizing, the benefits to the cable operator of attempting to raise the benchmark in this way are questionable. Higher prices would lead to overall lower profits or the prices would have been set higher in the

³⁸ The short term incremental cost test currently used by the Commission, however, is not an appropriate cross-subsidy test.

first instance. Stated alternatively, higher prices would have resulted in unacceptable loss of subscribers.

e. Individual System Cost-Based Alternatives

The Commission proposes two alternative cost-based systems as potential alternatives to the benchmarks described above: "direct costs of signals plus nominal contribution to joint and common costs" and "cost of service." Both alternatives would require collection of cost data in the equivalent of a Uniform System of Accounts for cable companies. The former apparently involves an explicit decision to load a higher portion of "contribution" on cable programming as opposed to basic services while the latter would apparently involve traditional cost of service regulation principles but without a specific requirement to minimize the contribution paid by basic service subscribers.

The problems with both of these alternatives were discussed generically under rate of return/cost-based regulation. However, two points can be made here. First, the "direct cost plus nominal contribution" approach is evidently raised in the NPRM in response to Congressional language that could be read to permit explicit subsidy for basic cable programming services, should the Commission find that desirable. Explicit subsidies of one cable service by another would not be a wise public policy choice.³⁹ The result could be to duplicate the inefficien-

³⁹ There may be legitimate marketing reasons for a cable operator to load more contribution on cable programming services. The problem arises when the government decides on the allocations when there is no compelling economic efficiency rational to do so.

cies found in the common carrier area. Large losses in economic welfare result from the existing subsidy of intrastate service through the Carrier Common Line Charge assessed on long distance carriers.

f. Cost of Service Regulation As A Backstop

As discussed above, as a matter of basic fairness and as a legal matter, systems whose rates exceed benchmark rates must be given an opportunity to attempt to justify those rates based on the particular circumstances of their operations, including unusually high cost of service. Application of a cost of service safety net will be costly for all of the reasons described here. Therefore, in selecting a particular benchmark (or set of benchmarks) the Commission should be aware of the trade-off between the costs and benefits of enforcement.

g. Conclusion

The menu of choices open to the Commission contains only imperfect alternatives. Selection of the "least worst" alternative may not be possible in the absence of an examination of the data being collected by the Commission as part of this proceeding. Moreover, it may not be possible to select the best approach until after systems have adjusted to the new channel line up requirements contained in the Act. Prior to these changes, the basis for comparison among systems may be invalid.

C. Equipment

The 1992 Cable Act requires the regulation of at least some equipment based on "actual cost."⁴⁰ The Commission raises the legal issue associated with the degree to which equipment not necessary to receive basic channels should be regulated in this way. Not regulating equipment unless it is necessary for receipt of basic service is consistent with the economic model of the 1992 Act presented earlier. The Congress has established a public interest in ensuring that those who must rely on cable services to receive high quality basic broadcasting are able to do so without having to pay excessive rates or purchase equipment they would not otherwise need. This objective precludes marketing strategies that cable companies might otherwise find profitable, such as including the cost of addressable convertor boxes in the basic rate in order to promote the eventual sale of tier or premium services. Under this theory, only equipment or associated services required to obtain minimal access to the basic broadcast tier would be regulated. This would include installation and convertors required to receive basic signals that are scrambled for security or other reasons.

A full rate of return/cost-of-service approach to equipment pricing would obviously suffer from all the shortcomings that the Commission identified when it expressed a preference for benchmark regulation over rate of return regulation for basic cable services. However, this approach may not be necessary. Several alter-

⁴⁰ As noted in the introduction, convertors, remotes, additional outlets and installation are all included in the equipment category.

natives that would rely upon actual costs but allow a more efficient rate setting process should be considered.

One such alternative would be to require cable systems to do a one-time study that would measure actual basic equipment purchase cost and the associated direct and overhead costs. These associated costs would include labor involved in testing and purchasing, inventory carrying costs, and administrative and overhead loading. Once an initial reasonable gross margin is established, subsequent annual rate adjustments or new types of equipment could be priced based on actual invoice cost and the gross margin calculated by the initial study. This would obviate the need to perform full cost of service studies. Alternatively, the Commission could conduct a one-time study to establish a nationwide gross margin that would be presumed reasonable for the industry.

The Commission should also consider an approach that would allow cable operator basic equipment prices to be presumed to be cost-based so long as the equipment is available for purchase by consumers from third parties. In this way, competitive market forces would generate an actual cost ceiling. However, there may be a host of security issues associated with allowing cable converters to be sold or leased by companies other than the cable company.

Installation rates could also be established with the use of actual studies using labor costs and associated overheads. However, such a process would be costly and time-consuming. A reduced cost alternative would be to allow cable system operators to charge no more than the hourly rate charged by regulated

public utilities in their regions for similar services. These rates have presumably been found reasonable by local public utility regulators.

D. Cable Programming Services

As discussed earlier, both to reduce regulatory burdens on taxpayers and cable companies (which would obviously impact their consumers), and because Congress has determined that the public interest in the pricing of cable programming services is not as great as in the case of basic services, cable programming services are not subject to regulation. Only in the limited circumstances in which prices for cable programming services are well in excess of industry standards is Commission oversight required.

An additional reason why cable programming services should not be regulated is that regulation would be more difficult because of the more heterogeneous nature of the service. At least the core of the basic service offering is likely to consist of similar program offerings across systems, making the use of nationwide benchmarks more feasible. On the other hand, cable system operators have great discretion over both the absolute number of cable programming channels offered and the specific array of programs. A detailed cost of service approach would have even less opportunity of working in this environment. Regulatory constraints could easily be circumvented by moving certain channels to premium status, eliminating more expensive programming, or adding inexpensive programming. Detailed oversight of program selection would be required. This is an obviously unpalatable alternative, both because of the direct costs it would

involve and the First Amendment implications of regulators second-guessing program choices. Similar problems would affect most of the benchmark alternatives.

Given these problems, the approach that seems most reasonable for identifying systems whose cable programming service rates require oversight is the average price regulation approach raised by the Commission as one of the alternatives for basic service regulation. Appropriate choice of the reasonableness cut-off point will allow the Commission to detect instances of apparently abnormally high rates without subjecting itself to an unmanageable flood of complaints. Rates in the top two or five percent would seem to be a reasonable cut-off point. Any lower cut-off could conceivably subject the Commission to an unmanageable workload. As with the basic service benchmark process, individual cable systems must have the ability to make a showing that given particular cost circumstances, their cable programming service rates are reasonable.

There are several alternatives for adjusting the cable programming services benchmark over time. One alternative is to use the same percentage annual adjustment factor used for the basic benchmark that is selected. However, if the basic service benchmark adjustment factor does not contain an element to reflect entertainment costs, then such a factor must certainly be included in the cable programming service adjustment factor.

An alternative to a specific benchmark factor is simply to gather the information necessary to recalculate the benchmark each year. This would

eliminate the concern that the adjustment factor would become obsolete over time. One potential flaw in this approach, however, is that by definition, each year a new set of outliers would be identified as the firms previously identified adjust their rates to come into compliance with regulations. This approach also introduces greater uncertainty as cable operators would not know in advance if they are exceeding the benchmark limit. The issue would be avoided altogether if, after the first year, rate changes instead of absolute rates are used to establish the benchmark. Only rate changes in the top two or five percent of the industry (for similarly situated firms) would subject the cable operator to Commission oversight.

As in the case of regulation of the basic service tier, there is no need to establish additional regulations covering rate adjustments by firms that fall below the cut-off point. Current rates are set in an unregulated environment and thus presumably represent profit maximizing behavior. Subsequent adjustments can be assumed to be efficiency-enhancing.

The price of equipment used to receive cable programming services should be factored into the cable programming benchmark. This would eliminate the need to establish an additional benchmark process for such equipment. This approach may also reduce measurement problems associated with identifying the benchmark by making it easier to compare systems with one another.

There are several reasons why the benchmark test for cable programming service prices should be based on the average price per channel of the basic and

cable programming tiers combined. First, allowing the cable programming tier to, in a sense, reflect the effect of basic service prices that may be held too low by regulation of that tier may reduce the need for costly system-by-system cost proceedings. Second, given the public interest determination by the Congress, system operators should be encouraged and not deterred from choosing marketing strategies that use low priced basic service as an inducement to consumers to hook up to the network.⁴¹ If the cable programming tier benchmark does not allow "credit" for these low rates, they are less likely to be employed.

E. Leased Access

Pricing of leased access will differ substantially from pricing of the elements of cable service because, in general, leased access is sold to cable television programmers rather than end users. As noted above, the apparent intent of leased access channels is to provide programmers with an alternative outlet for their product in order to promote diversity. If the object of leased access rate regulation is to ensure diversity, this leads to an obvious policy target: if leased access channel capacity is actually being used by non-affiliated programmers, then no rate regulation is necessary because the public interest objectives set by Congress are obviously being met. Thus, as a first benchmark, the Commission can identify minimum usage levels and make a presumption that rates are reasonable as long as these requirements are met.

⁴¹ As, or if, cable companies begin offering telecommunications service such as PCS, this strategy may become more important.

Direct regulatory oversight would not be automatically triggered, even if minimum usage requirements are not being met. Obviously, if there is no demand for leased access channel capacity, there is no need to regulate the price at which it is offered. However, if there are potential leased access programmers who are unable to successfully negotiate channel capacity, then some means will have to be found for establishing a reasonable maximum price.

The maximum price for leased access channel capacity could be established by imputing a channel's value from other information that might be readily observable. For example, the per hour or per channel net revenues from premium services establish a potentially observable maximum opportunity cost for channel capacity. Any incremental costs, including studio rental and production would be added to this maximum.

Establishing the maximum in this way would generate several positive incentive effects. First, existing programmers would be discouraged from switching to leased access capacity. Such changes would not provide the sort of diversity that Congress apparently had in mind. Second, the cable operator would be free to negotiate rates below the maximum on a case by case basis in order to generate demand from potential leased access programmers. The cable operator would have an incentive to negotiate lower rates for other programmers up to the point where marginal revenues exceed marginal costs. In general, to the extent that potential leased access programming does add diversity to the system's offering,

cable operators have an incentive to have it as part of their programming because the added diversity increases the value of subscription.

IV. TRANSITIONAL ISSUES

The 1992 Cable Act presents a large number of difficult transitional issues. Many cable system operators will face requirements to make substantial changes in the way they do business. For example, in many cases, equipment pricing policies will have to be changed and channels will have to be rearranged and retiered. These changes will affect billing systems and the actual configuration of the cable system. In the case of retiering, some systems may be required to deploy technicians to make physical changes in equipment in the field. This suggests that the Commission must be flexible in terms of providing the industry time to come into compliance with the new rules that will be adopted.

These changes will impose significant costs on the industry, but perhaps just as significantly, these changes must be explained to customers who will have to choose among a new set of options. This too suggests that the industry should be given a substantial period of time to come into compliance with new regulations.

Finally, in order to come up with more valid comparisons for the benchmarks described in the previous Section, it may be necessary to allow the cable operators to retier and reprice their systems to come into conformance with the basic service tier signal carriage requirements first.

V. CONCLUSION

In choosing from among a set of imperfect alternatives, the Commission should, everything else being equal, select the least intrusive regulatory instruments. Basic service tier regulation based on benchmarks derived from readily available or easily gathered observable data will allow the Commission to satisfy the objectives of the 1992 Cable Act. Rate of return regulation, on the other hand, is likely to be too costly to implement in the cable industry.

Cable programming services should be left unregulated unless rates are found to be substantially above industry averages in individual cases. Equipment and ancillary service prices need be regulated only when the equipment is necessary for the receipt of the basic service tier. Approaches that minimize the burden of estimating equipment costs should be adopted. Leased access rate regulation is unnecessary where the objectives of the Act are already being achieved. Maximum price regulation needs to be applied only where there is both unmet demand and significant excess leased access capacity.

Finally, cable companies must be allowed to make adjustments to the new rules the Commission will adopt. Any rules adopted should allow for a significant transition period that may include phase-ins of the various requirements of the 1992 Cable Act.

If these steps are taken, the potential for significant harm to a dynamic industry will be minimized. In the long run, both consumers and the industry will benefit and scarce regulatory resources will be conserved.

Resume of Daniel Kelley

PROFESSIONAL EXPERIENCE:

Senior Vice President, Hatfield Associates, Boulder Colorado, (current position).

Conducting economic and applied policy analysis of domestic and international telecommunications public policy and business issues.

Director of Regulatory Policy, MCI Communications Corporation, 1984-1990.

Responsible for developing and implementing MCI's public policy positions on issues such as dominant carrier regulation, Open Network Architecture, accounting separations and Bell Operating Company line of business restrictions. Also managed an interdisciplinary group of economists, engineers and lawyers engaged in analyzing AT&T and local telephone company tariffs.

Senior Economist and Project Manager, ICF Incorporated, 1982-1984.

Telecommunications and antitrust projects included: forecasting long distance telephone rates; analysis of the competitive effects of AT&T's long distance rate structures; a study of optimal firm size for cellular radio markets; analysis of the FCC's Financial Interest and Syndication Rules, and competitive analysis of mergers and acquisitions in a variety of industries.

Senior Economist, Federal Communications Commission, 1979-1982.

Served as Special Assistant to the Chairman. Advised the Chairman on proposed regulatory changes in the broadcasting, cable television and telephone industries; analyzed legislation and drafted Congressional testimony. Coordinated Bureau And Office efforts on major common carrier matters such as the Second Computer Inquiry and the Competitive Carrier Rulemaking. Also held Senior Economist positions in the Office of Plans and Policy and the Common Carrier Bureau.

Staff Economist, U.S. Department of Justice, 1972-1979.

Analyzed proposals for restructuring the Bell System as a member of the economic staff of U.S. v. AT&T; investigated the competitive effects of mergers and business practices in a wide variety of industries.

EDUCATION:

1976	Ph.D. in Economics	University of Oregon
1971	M.A. in Economics	University of Oregon
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PUBLICATIONS AND COMPLETED RESEARCH:

"Gigabit Networks: Is Access a Problem?" IEE Gigabit Networking Workshop (1992).

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Maryland Public Service Commission, Case No. 0450-Phase II, May 31, 1983: Access charge implementation issues.

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Georgia Public Service Commission, Docket No. 3987-U, January 31, 1992: Cross-Subsidy

Colorado Public Utilities Commission, Docket No. 92R-050T, August 24, 1992: Collocation

Connecticut Department of Public Utility Control, Docket No. 91-10-06, September 25, 1992: Infrastructure