customers, new access services increase competition and improve efficiency in all cases. The economic logic for this proposition is straightforward: any new service offering will always make customers better off in the aggregate, provided there is no change in the price and number of existing services, because customers will have more choices with the new service than before. When customers have all of the existing choices as well as the new services, some customers can make themselves better off by choosing the new service. All other customers are no worse off because they can continue to exercise their current choice. *Therefore, we urge the Commission to modify its procedures to eliminate all advance approval requirements, so long as existing services remain available to customers.* If a LEC seeks to eliminate or restructure an existing tariffed service, then the Commission could review the application to see whether customers would be disadvantaged. Note that any delay in the approval of a tariff removal is much less likely to harm customers or competition than a delay in the approval of a new service or pricing plan.

11. Immediate reform of access price and service regulation will increase consumer welfare and promote competition, efficiency, innovation and investment, whether or not LECs face effective competition in access services. In no case are the economic benefits of these reforms contingent upon the existence of competition, much less effective competition. On the contrary, the reforms we advocate will generate substantial benefits even in markets where there are no other providers of interstate access services. When LECs seek to introduce new services under federal jurisdiction they can suffer any or all of three different and cumulative types of delays which their competitors do not experience: (1) costing and tariff preparation delays; (2) Part 69 waiver delays; and (3) typical tariff filing delays of 90 days (45 days notice plus 45 additional days due to third party intervention or Commission investigation). If the Commission implements its

proposed discretionary tracking regime, new services could also face "tracking delays." These delays are costly to LECs, harm the customers who would benefit from earlier availability of new services, and reduce competition in the marketplace. Hence, we offer recommendations for regulatory reforms that will expedite new service offerings, increase pricing flexibility and promote competition.

1. Eliminate the Part 69 waiver process to reduce delays in new services

12. To allow customers to realize the enormous potential for new switched access services, the Part 69 waiver requirement should be eliminated immediately. As recognized by Commission staff:

> "There are also technological innovations that may create new LEC services that did not exist when the rules were developed. As stated, although Part 69 prescribes a fixed structure, many new services do not fit neatly into existing Part 69 rate elements."[8]

As a result, waivers must be obtained before new service tariffs can be filed. The Part 69 waiver process, however, delays the introduction of new services to market, increases the uncertainty over when a new service will be allowed in the market and enables competitors to use the regulatory process to create additional delay and exploit it for competitive advantage. In Bell Atlantic's case, for example, the Part 69 Waiver process alone has delayed the introduction of services by as long as a year and a half.[9]

13. There are also significant administrative costs of the Part 69 waiver process, both to the Commission and to LECs. Given the momentous changes occurring in telecommunications, it is

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[8] Access Reform Task Force, FCC Staff Analysis, *Federal Perspective on Access Charge Reform*, April 30, 1993, p. 40.

[9] Switched Facilities Management Service (18 months and still outstanding), InterLATA Operator Call Completion Service (12 months) and Optional 800 Data base service (11 months).

imperative that the Commission devote its scarce resources where the net benefits are greatest. Likewise, LECs face severe pressures to cut costs to compete effectively, so the compliance costs of obtaining waivers could be put to much more productive uses. Moreover, as the number of new services continues to proliferate, the administrative costs of the waiver process will escalate in the future, unless the process is significantly reformed or eliminated.

14. Eliminating the Part 69 waiver process can also reduce the abuse of the regulatory process by LEC competitors to delay the offering of new services or pricing options to gain artificial competitive advantage. Consider the following example of competitors deliberately delaying new service offerings or pricing options, to the detriment of Bell Atlantic and its customers: In December 1993 Bell Atlantic filed a petition for waiving of Part 69 rules to establish rate elements for InterLATA Operator Services (IOS) to be furnished to small interexchange carriers (IXCs) who lacked the capability to self-supply IOS.[10] Several large IXCs who already provided IOS filed protests, which were later dismissed by the Commission. However, the waiver was not granted until December 1994, a full year later. This gave Bell Atlantic's competitors lead time to develop services and sign long term contracts in anticipation of Bell Atlantic's entry into the market. By the time the tariff was approved, Bell Atlantic lost the opportunity to sign contracts with many potential customers who had already signed with other providers, and those customers lost the opportunity to benefit from the competition that Bell Atlantic would have added for these services. Eliminating the Part 69 waiver process will encourage LEC competitors to compete in the marketplace, by offering new services or better service, rather than in the regulatory arena.

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[10] Specifically, Bell Atlantic was seeking to offer automated and live operator call completion for interLATA collect, calling card and third number calls. Bell Atlantic would perform all functions on these calls including branding, verification, calling card validation and information processing necessary for billing.

15. Moreover, there is no harm to the public interest by eliminating the waiver requirement. As explained below, the Commission still retains the authority to investigate services once they are introduced and take remedial action if warranted. In addition, customers with specific concerns can still obtain relief through the complaint process.

2. Modify tariff rules to allow changes on one day notice without cost support

16. The notice periods for tariff filings should be reduced to one day to avoid unnecessary delays in the introduction of new services and service options, and in the offering of alternative pricing plans. Under current rules, tariff effectiveness can be delayed as long as nine months, and then the Commission can still conduct a further investigation for another 15 months.[11] For Bell Atlantic, one third of its tariffs filed in the last year were delayed an average of 45 days due to third party intervention or investigation by the Commission. When this delay is combined with the 45 day notice requirement, the tariff process alone prevents new services from entering the market for three full months on average. By requiring long notification periods before approval of new tariffs filed by LECs, competitors know they will have plenty of time to react to a LEC's lower prices before they actually go into effect, which means they do not need to lower their prices in anticipation of possible price reductions:

> "According to Barbara Sampson, senior vice president and co-founder of Intermedia Communications, a Florida based CAP, 'We are not confronted by <u>the regulatory burden</u> like the telcos and the cable companies,' she said. 'This is a natural competitive advantage.'"[12]
>
> "Key to the current success of CAPs is the fact that they can be more responsive to customer requests than the average local exchange carrier. 'If a user asks for something

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[11] 47 U.S.C.§§ 203(b)(1); 204(a)(1); 204(a)(2)(A) & (B).

[12] Titch, Stephen, "In a Quest for Growth, Competitors Invade More Telco Markets," *Telephony*, June 28. 1993, p. 6.

off-tariff, the RBOC has to deal with regulatory issues that the CAP doesn't,' says Colleen Beck, managing analyst at Datapro."[13]

17. The Commission has recently concluded that "dominant carrier regulation" inhibited AT&T's ability to offer new services and actually inhibited competition in the market for interexchange services:

> "The cost of dominant carrier regulation of AT&T in this context includes inhibiting AT&T from quickly introducing new services and from quickly responding to new offerings by its rivals. This occurs because of the longer tariff notice requirements imposed on AT&T which allow AT&T's competitors to respond to AT&T tariff filings covering new services and promotions even before AT&T's tariffs become effective. The longer notice requirements imposed on AT&T thus also reduce the incentive for AT&T to initiate price reductions. In addition, to the extent AT&T were to initiate such strategies, AT&T's competitors could use the regulatory process to delay, and consequently, ultimately thwart AT&T's strategies."[14]

These arguments also apply to the regulation of LEC's access services. The Commission should thus be wary of perpetuating regulations that can create a price umbrella which results in higher prices for all customers.

18. Eliminating the artificial advantages of regulatory delays in pricing changes by LECs will directly benefit customers and enhance competition. Similarly, eliminating requirements for unnecessary cost studies in support for new tariff filings by LECs will not allow competitors to use strategically sensitive information to target those customers or market segments where the incumbent LEC is least likely (or, due to cost floors, unable) to respond to their pricing initiatives. The existing complaint process provides the Commission sufficient opportunities to obtain the

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[13] Briere, Daniel and Finn, Christoper, "CAPitalizing on Local Access," *Network World*, September 6, 1993 (emphasis added).

[14] *Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier*, Order, FCC 95-427, ¶ 27, Oct. 23, 1995.

information necessary to establish whether the price of a given service passes the incremental cost price floor, thereby deterring discriminatory or predatory pricing of new service offerings, but without delaying the introduction of new services.

19. Our analysis and conclusions about the benefits of reducing new service delays are not limited to a subset of services. Thus there is no need for the proposed division of new services into two regulatory tracks -- one of which would continue to have regulations imposed on it that are unnecessary for any service -- as proposed in the Second Further Notice. Tracking will be a time-consuming process, no matter who makes the decision or the basis on which the tracking decision is made. Disputes over the tracking of a new service will consume scarce resources and delay introduction of new services. In addition, tracking would provide another avenue for opportunistic uses of the regulatory process by competitors who benefit privately from delaying LEC services, raising LECs' costs of regulatory compliance and gaining access to competitively valuable information. Conversely, there are no significant benefits from tracking new services. New services priced above incremental cost can only increase economic welfare. Hence, there is no reason to track new services. The Commission might choose to require specific procedures such as cost study support for mandatory interconnection services. But a limited and well defined exception does not lessen the harm of tracking new services more broadly.

3. Do not impose price cap restrictions on new services

20. Just as a new service or alternative pricing plan should not have artificial regulatory barriers delaying its introduction, it should also not have unnecessary regulation once it is introduced. As Professor Alfred Kahn previously explained in an earlier stage of this proceeding,

there is no reason to subject such services to price cap controls.[15] So long as a service is either truly new -- and thus discretionary -- or it functions as an alternative to an existing service that is either competitive or subject to price cap regulation, there is no reason to place pricing restrictions on it. Discretionary services can be rejected by the market and only will be purchased if the price is deemed reasonable by the market. If they are overpriced, consumers will not buy the service and competitive entry of lower priced providers will be spurred. Alternative pricing plans will only be found attractive by potential customers if they meet a specific need that the original service did not. Thus, the success or failure of these services will be market-driven. In that situation, price caps are an unnecessary regulatory constraint that cause affirmative harm and should yield to market-based pricing.[16]

4. Remove unnecessary restrictions on downward pricing flexibility

21. For those services remaining in price caps, the only restriction in downward pricing flexibility that serves a valid public policy purpose is a price floor based on incremental cost to protect against anticompetitive pricing. There are no pro-competitive benefits of other restrictions on downward pricing flexibility. Any additional limitations on downward pricing flexibility harm customers, by keeping prices higher. Preventing a LEC from raising a price after it was lowered simply discourages price reductions, thereby harming customers. Given the complexity and rate of change in telecom markets, carriers need to be able to move prices down

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[15] Affidavit of Alfred E. Kahn, ¶¶ 30-32, filed as an attachment to Reply Comments of Bell Atlantic, *Price Cap Performance Review for Local Exchange Carriers*, CC Docket 94-1, June 29, 1994.

[16] As with the modification to the tariff rules, a narrow exception may be necessary for mandatory interconnection services.

and up to find "market levels." Hence, the Commission should remove those elements of price regulation (such as Service Band Indexes) that restrict downward pricing flexibility.

22. Restricting downward pricing flexibility by incumbent LECs can inhibit price competition by providing a further basis for a price umbrella, allowing CAPs to price above competitive levels. Limitations on downward pricing flexibility can hold LECs' prices above their costs, causing customers to pay excessive prices or buy from a less efficient supplier. When LECs are required to charge prices that are at odds with the cost of and demand for services, competitors will exploit their vulnerability by targeting the affected customers. Such targeting causes LECs to lose the contribution to common costs they could otherwise realize from those customers, leaving a larger share of common costs to be borne by their remaining customers. As noted by the Commission staff:

> "If only the LECs are subject to rigid rate structure rules, they will be at a competitive disadvantage in their ability to respond to the market. LEC customers may choose to take service from a competitor in order to avoid artificially high LEC rates or to obtain alternative rate structure options."[17]

23. Subject to an incremental cost-based price floor, LECs should also be allowed to offer alternative pricing plans such as term and volume discounts, which are widely used by CAPs and IXCs:

> "An ever-present factor in evaluating almost any service is price. Unfortunately, this is a difficult factor to quantify since CAPs keep their actual pricing close to their vests. Practical experience says that CAPs can prove to be as much as 15% lower than local exchange carriers for an equivalent circuit; exactly how much an end user can save depends on service ordered, size of contract, and volume and term commitment."[18]

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[17] Access Reform Task Force, FCC Staff Analysis, *Federal Perspective on Access Charge Reform*, April 30, 1993, p.34.

[18] Briere, Daniel and Finn, Christoper, "CAPitalizing on Local Access," *Network World*, September 6, 1993.

Such discount plans are standard pricing practice in nearly every industry we have studied:

> "Steel manufacturers grant the automobile companies substantially lower prices than they offer other industrial buyers. They do so because auto manufacturers use such large volumes they could easily operate their own mill or send negotiators around the world to secure better prices... Xerox gives volume discounts based on a buyer's total purchases of copiers, typewriters, or printers. Digital Equipment Corporation gives discounts for multiple purchases of a single model, but in addition gives discounts based on a buyer's total expenditure on all products from the company."[19]

Similarly, discount pricing, including term and volume discounts, are competitive necessities in a telecommunications environment where there is little product differentiation between different suppliers. Any regulations which inhibit the use of such discounts impedes competition and prevents customers from obtaining the lowest possible price for the services they purchase.

24. Finally, the Commission should not limit upward pricing flexibility so long as the LECs' prices comply with their respective price caps. In particular, the Commission should not impose limits on LECs' ability to subsequently increase a price after a price decrease. Such restrictions create a disincentive for reducing prices in the first place. Especially in dynamic markets such as telecommunications services, the best information about what customers want and what they are willing to pay comes from the market itself. By raising and lowering prices, by offering services in various configurations and packages, and by observing and measuring the results, LECs can gain the valuable information they need to serve their customers well and compete with unregulated firms who have almost complete flexibility in responding to different market conditions.

5. Eliminate the earnings sharing provision of the price cap formula

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[19] Thomas T. Naglle and Reed K. Holden The Strategy and Tactics of Pricing A Guide to Profitable Decision Making, New Jersey Prentice Hall, 1995, p. 219.

25. While a price cap plan with a sharing requirement is better than traditional rate of return regulation, sharing reduces the incentives for efficiency, investment and innovation. Sharing is also contrary to competitive parity, since competitors are not profit-constrained, while the LEC is. Moreover, under sharing, it is likely that the Commission will continue to regulate the rate base by prescribing depreciation rates, implicitly forcing the LECs to artificially overstate their earnings for sharing purposes, which increases LECs' investment risk and reduces incentives for LEC investment. Regardless of the level of competition faced by LECs, sharing reduces economic efficiency and should be eliminated. While the benefits of pure price cap regulation are not contingent on the presence of competition, rapidly emerging or significant levels of competition increase the advantages of pure price caps over sharing plans. This explains why at least 19 states have already adopted pure price caps plans with no sharing requirement as the proper regulatory framework for the transition to full competition. Similar plans are currently under consideration in additional states, and the numbers will undoubtedly continue to grow.

C. REMOVAL OF REMAINING SERVICES FROM PRICE REGULATION

26. Because "competition is the best regulator," most economists favor eliminating price regulation as soon as actual or potential competition limits the exercise of market power. In determining whether an industry is suitable for deregulation, economists generally do not require that an industry has the characteristics of a perfectly competitive market. They recognize that many industries perform well despite a highly concentrated market structure, and that even industries with a "dominant" firm are not likely to be improved by imposing industry regulation. Regulation imposes particularly severe costs for industries that are characterized by rapid technological change because it takes time for regulators to search for and adopt policy changes.

Hence, in addressing the removal of LEC services from price cap regulation, we explain why the Commission should take a forward-looking approach and adopt standards that allow removal as soon as there is evidence that LEC services in a relevant market are vulnerable to significant competition.

27. Market statistics serve only as a guide to investigate the extent of market power, which must be assessed by evaluating the factors described below in their specific market circumstances. In making this assessment, the Commission should not lose sight of the substantial costs of regulation. The test for removing constraints on LEC pricing should not be proof of a complete absence of market power. Instead, price cap regulation of a service should be eliminated as soon as there is enough actual or potential competition in a given market so that market outcomes are likely to be superior to regulated outcomes.

28. Moreover, in making the determination to remove a service from price cap regulation, the Commission should err on the side of the market, for two reasons. First, by waiting for even more competition to materialize, the Commission risks denying the benefits of that competition to consumers that enter into long term relationships with suppliers in a regulated environment. Those consumers would be better off if the LEC and alternative providers could compete for their demands. Second, the decision to ease regulatory constraints does not have to be permanent. The Commission could re-impose regulations if market forces prove inadequate. Accordingly, the Commission should use this proceeding as an opportunity to set basic rules for the removal of services from price cap regulation as soon as there is a demonstration of a competitive alternative.

1. LECs need flexibility to define the scope of competitive alternatives

29. Given the dynamics of technology and market demand in interstate access services, as well as shifting cross-elasticities among services, LECs should be allowed reasonable latitude to

present evidence that is relevant to defining the product, geographic and customer scope of their markets for the purposes of demonstrating competition and seeking regulatory relief. It is critical that LECs retain the flexibility to tailor competitive showings to the developing marketplace.

30. The relevant scope of services to be removed from regulation could be defined by product, geography, customer characteristics, and/or some combination of the three. It is a set of product offerings in a geographic area for which a hypothetical monopoly supplier of those products would be able to raise price by a significant amount for a significant period of time to a significant group of customers. For example, some services may be competitive throughout a LEC's service area, while others in a more limited geographic area, and still others for a limited subset of customers. For example, businesses with more than a certain number of lines may have a competitive alternative for a number of services, while customers with fewer lines may not have the same alternatives over the same service group. Regardless, so long as a showing of a competitive alternative is made for a given portion of the market, price regulation should be removed for that portion.

2. The use of addressability in assessing competition in relevant markets

31. Having determined the scope of services to be removed from price caps, the Commission must also establish the criteria for evaluating the presence of a competitive alternative. We strongly urge the Commission to base the decision on measures of competition that are directly related to the likelihood that a LEC can raise the price or lower output of a service. For example, if a ten percent price increase would likely result in the loss of more than ten percent of a LEC's traffic, the price increase would not be profitable. In many markets, a few customers may account for more than two thirds of a LEC's total traffic. These customers can turn to alternative providers, and would do so in response to any appreciable price increase or reduction in service

quality by the LEC. Moreover, price increases may result in the reduction of overall demand for a service, further reducing revenues. The LEC is unlikely to raise price or lower output significantly in these markets, without regard to its current market share.

32. One metric for assessing competition is "addressability," which captures the ability of a LEC to raise prices or lower output to particular customers or service areas. A market is addressable when customers representing enough volume have available one or more alternative providers, so that a price increase by the LEC would be unprofitable. The alternative provider's service should be available at a price that is comparable to the price being paid to the LEC. An alternative carrier with facilities that pass by or are in close proximity to a customer would be an example.

33. The addressability concept is similar to that of the "uncommitted entrant" in the 1992 DOJ/FTC Horizontal Merger Guidelines. An uncommitted entrant is a firm that is not an actual supplier in a relevant market, but has capacity in place that can be used to serve demand in that market with little additional sunk expenditures. The Horizontal Merger Guidelines treat an uncommitted entrant as if it were an actual supplier in the estimation of market shares. As an example, consider a market in which firm A has the capacity to serve 80% of market demand and firms B, and C, each have the capacity to serve 10%. Suppose there is another firm, an uncommitted entrant, with the capacity to supply 100% of market demand. Under the Horizontal Merger Guidelines, rather than use historic market share, the forward looking division of the market would be calculated as 40% for firm A, 5% for firms B, and C, and 50% for the uncommitted entrant.

34. While there is no magic number on which to base a removal of price controls, we propose that a 25 percent test be applied in the following way. If more than 25 percent of a relevant

market defined by the LEC is addressable, and consumers are willing and able to switch suppliers at relatively low cost, there should be a strong presumption that the public interest would be served by the removal of price controls in that market. This means that the LEC would have to raise prices at least 25% to recover the loss of those customers -- an action that would spur further competitive losses. The Commission, of course, should be able to rebut this presumption. However, such rebuttal should be based on actual market evidence that competition is not sufficient to protect consumer interests, relative to the regulated baseline. If less than 25 percent of a relevant market is addressable, the burden should be on the LEC to show that the removal of price controls would be in the public interest. The LEC might be able to meet this burden by showing that barriers to the entry of new competitors are low, or that there is a history of increasing competition as revealed by declining prices and that this trend is likely to continue.

35. A LEC seeking to remove a service from price cap regulation should also be allowed to present other indicators of competition, including evidence of:

- the rate at which entry and addition of capacity is occurring; the size, resources and customer relationships of actual and potential competitors;
- the degree of vertical integration of actual and potential competitors and their ability to offer a wide range of access, exchange, interexchange and/or enhanced services;
- reductions in entry barriers due to technological innovations (e.g., upgrading cable networks to provide access services; provision of access services by wireless carriers at prices competitive to wireline carriers);
- non-price (service) competition, especially in the case of differentiated services;
- the presence of large, sophisticated buyers with low costs of switching suppliers, who are able to play one supplier against another, and can induce bidding contests to erode prices.

3. Market share is the wrong measure for assessing competitive alternatives

36. In contrast to addressability, market share is not an accurate measure of competitive alternatives. Market share is a backward looking measure and focuses on past competitive losses, rather than forward looking competitive alternatives. Most fundamentally, it is the availability of competitive alternatives, not the number of customers who have signed up for a competitor's services that controls market power. In addition, market share data can mask the true competitive situation under any of the following conditions, all of which apply to LECs' interstate access services:

a. **If markets are defined too narrowly or too broadly**, market shares may overstate the ability of a firm to raise price or lower output. This is particularly important in telecommunications where rapid changes in technology make market boundaries difficult to define and where customers may substitute alternative types of services that provide similar functions (such as special access for switched access). For markets defined too broadly, the concern is that general market share statistics may mask individual markets where a competitive alternative is present.

b. **A large market share does not connote market power when other firms can and will enter the market** in response to higher prices, lower output, or degradation of service. CAPs have demonstrated an ability to enter and compete for customers in many markets. Often, such entry requires little or no sunk investment, because new competitors can offer services by packaging existing LEC offerings or because facilities-based competitors are already established in neighboring markets.

c. **A large market share may not permit a firm to raise price or lower output if customers have significant buying power.** Large customers, [such as the big three facilities-based interexchange carriers,] can switch suppliers and have devastating consequences on a supplier's profitability. In these circumstances, even a firm that has a very large market share may have little power to price above its long run incremental cost of service. The large customer can turn to an alternative provider, and the mere threat of a switch is enough to discipline LEC pricing across the board. In many circumstances, the customer can sponsor the entry of a CAP if existing suppliers are not an acceptable alternate source. Moreover, if regulators wait until the switch is made, the benefit of the reclassification is lost because the LEC has been prevented from competing for the customer's demand.

d. **In markets where buyers enter into private negotiations for supply or self supply, market share may not correctly measure actual market presence.** A large buyer may enter into a supply arrangement that is not known to market regulators. Substantial volumes of traffic are unreported, resulting in significant "reporting bias" in

the estimation of market shares. Even if market shares are known at present, buyers could have private deals in the making that would drastically alter existing competitive relationships. To count only those services purchased by IXCs from either LECs or CAPs dramatically overstates the market share of LECs. Moreover, CAPs and IXCs have very strong incentives to keep such information private, for it has great strategic value in the regulatory process.

37. In summary, if the Commission wants to promote competition and allow customers to enjoy the full benefits of competition, it should allow LECs to use addressability and other indicators of competitive alternatives when seeking to remove a service from price cap regulation. Unnecessary restrictions on pricing flexibility should be removed and rules and procedures that delay the introduction of new services should be eliminated.

AFFIDAVIT OF RICHARD J. GILBERT

I, Richard J. Gilbert, being duly sworn, depose and say that the foregoing testimony is true and correct to the best of my knowledge and belief.

Richard J. Gilbert

Subscribed and sworn to before me this 7th day of December, 1995.

Kathy A. Stephan
Notary Public

My Commission Expires

4-11-97

KATHY A. STEPHAN
Comm. # 991298
NOTARY PUBLIC - CALIFORNIA
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My Comm. Expires Apr. 11, 1997

AFFIDAVIT OF ROBERT G. HARRIS

I, Robert G. Harris, being duly sworn, depose and say that the foregoing testimony is true and correct to the best of my knowledge and belief.

Robert G. Harris

Subscribed and sworn to before me this 7th day of December, 1995.

Kathy A. Stephan
Notary Public

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President, *Industrial Organization Society*, 1993-1994
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Co-Director, Program on Workable Energy Regulation, 1990-1993.

Review Panel, National Science Foundation, Economics Program, 1985

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Conference Organizer: Post-Chicago Economics Conference, Washington, D.C., May 26-27, 1994.

Conference Organizer: International Comparisons of Electricity Regulation, Toulouse, May 1993.
Conference Organizer: Economics of Energy Conservation, Berkeley, June 1992.

Conference Organizer: Telecommunications Policy Research Conference, 1988, 1989

Conference Organizer: Developments in Electricity Regulation, Berkeley, June 1987.

Session Organizer: 1987 Meeting of the Econometrics Society, 1994 and 1984 Meetings of the American Economic Association, 1983 Meetings of ORSA/TIMS Associations.

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PUBLICATIONS

ARTICLES

"Defining the Intersection of Intellectual Property and the Antitrust Laws: The 1995 Antitrust Guidelines for the Licensing of Intellectual Property," **Antitrust**, vol. 9, issue 3, Summer, 1995.

"Regulating Complementary Products: A Comparative Institutional Analysis," with Michael Riordan. **Rand Journal of Economics**, vol. 26, no. 2, Summer, 1995, pp. 243-256.

"Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets," with Steven Sunshine, **Antitrust Law Journal**. v. 63, no. 2, Winter 1995. pp. 569-602.

"The Dynamic Efficiency of Regulatory Constitutions," with David Newbery, **Rand Journal of Economics**, vol. 25, no. 4, Winter, 1994, pp. 538-554.

"A Review and Analysis of Utility Conservation Incentive Programs, with Steven Stoft, **The Yale Journal on Regulation**, Winter, 1994, pp. 1-42.

"Coordination in the Wholesale Market: Where does it Work?," with Edward Kahn and Matthew White, **The Electricity Journal**, vol. 6, no. 8, October 1993, pp. 51-59.

"Uncle Sam at the Gas Pump: The Causes and Consequences of Gasoline Distribution Regulations," **Regulation**, vol. 16, no. 2, 1993, pp. 63-75.

"Alternative Entry Paths: The Build or Buy Decision," with David Newbery, **Journal of Economics, Management, and Strategy**, Spring, 1992, pp. 129-150.

"Product Line Rivalry with Brand Differentiation," with Carmen Matutes, **The Journal of Industrial Economics**. September, 1993, pp. 223-240.

"Introduction to Symposium on Compatibility: Incentives and Market Structure," **The Journal of Industrial Economics**, March 1992, pp. 1-8.

"Legal and Economic Issues in the Commercialization of New Technology," **Journal of Institutional and Theoretical Economics**, March 1991. pp. 155-181.

"Multiproduct Competition," with Carmen Matutes, **Annales d'Economie et de Statistique**. vol. 18. April/June 1990. pp. 151-163.

"Optimal Patent Length and Breadth," with C. Shapiro, **Rand Journal of Economics**, vol. 21. no. 1, Spring 1990, pp. 106-112.

"The Role of Potential Competition in Industrial Organization," **Journal of Economic Perspectives**, vol. 3, No. 3, Summer 1989, pp. 107-127. Reprinted in Bonanno, G. and D. Brandolini (eds.), **Industrial Structure in the New Industrial Economics**, Clarendon Press, Oxford, 1990, pp. 38-67.

"Investment and Coordination in Oligopolistic Industries," with M. Lieberman, **Rand Journal of Economics**, vol. 18, no. 1, Spring 1987, pp. 17-33.

"Comment on Levin, R., A. Klevorick, R. Nelson, and S. Winter, 'Appropriating the Returns from Industrial Research and Development,'" **Brookings Papers on Economic Activity**, vol. 3, 1987, pp. 821-824.

"Investing Under Regulatory Uncertainty: What to do When the Rules Change," with H. Chao and S. Peck, **Energy Systems and Policy**, vol. 9, no. 4, 1986, pp. 385-396.

"Efficient Pricing During Oil Supply Disruptions," with K. Mork, **Energy Journal**, vol. 7, no. 2, April 1986, pp. 51-68.

"Entry Deterrence and the Free Rider Problem," with X. Vives, **Review of Economic Studies**. vol. LIII(1), no. 172, January 1986, pp. 71-84.

"Competition with Lumpy Investment," with R. Harris, **Rand Journal of Economics**, vol. 15. no. 2, Summer 1984, pp. 197-212.

"Will Oil Markets Tighten Again? A Survey of Policies to Manage Possible Oil Supply Disruptions," with K. Mork, **Journal of Policy Modelling**, vol. 6. no. 1, 1984, pp. 111-142.

"Customer and Investor Evaluations of Power Technologies: Conflicts and Common Grounds," with H. Chao and S. Peck, **Public Utilities Fortnightly**, vol. 113. no. 9, April 26, 1984, pp. 36-41.

"Preemptive Patenting and the Persistence of Monopoly: Reply," with D. Newbery, **American Economic Review**, vol. 74, no. 1, March 1984, pp. 251-253.

"Uncertain Innovation and the Persistence of Monopoly: Comment," with D. Newbery, **American Economic Review**, vol. 74, no. 1, March 1984, pp. 238-242.

"Strategic Considerations in Invention and Innovation: The Case of Natural Resources, with P. Dasgupta and J. Stiglitz, **Econometrica**, vol. 51, no. 5, September 1983, pp. 1439-1448. Reprinted in Binmore, K. and P. Dasgupta (eds.), **Economic Organizations as Games**, Basil Blackwell.

"Preemption, Leapfrogging and Competition in Patent Races," with D. Fudenberg, J. Stiglitz, and J. Tirole, **European Economic Review**, vol. 22, no. 1, June 1983, pp. 3-32.

"Incentives for Technical Change under Alternative Market Structures: The Case of Natural Resources," with P. Dasgupta and J. Stiglitz, **Review of Economic Studies**, vol. 49(4), no. 158, October 1982, pp. 567-582.

"Preemptive Patenting and the Persistence of Monopoly," with D. Newbery, **American Economic Review**, vol. 72, no. 2, June 1982, pp. 514-526.

"Investment Decisions with Economies of Scale and Learning," with R. Harris, **American Economic Review**, Papers and Proceedings, vol. 71, no. 2, May 1981, pp. 172-177.

"Reducing Uranium Resource Uncertainty: Is it Worth the Cost?" with R. Richels, **Resources and Energy**, vol. 3, 1981, pp. 13-37.

"Optimal Depletion of an Uncertain Stock," **Review of Economic Studies**, vol. 46, no. 142, January 1979, pp. 47-58.

"An Overview of the Economic Theory of Uncertainty and Its Implications for Energy Supply," with D. Newbery and J. Stiglitz. **Electric Power Research Institute Technical Report**, January 1978.

"Dominant Firm Pricing with Exhaustible Resources," **Bell Journal of Economics**, Autumn, vol. 9, no. 2, 1978, pp. 385-395.

"Factor Price Stabilization with Flexible Production," **Annals of Economic and Social Measurement**, vol. 5, no. 5, 1978, pp. 521-533.

"The Effects of Risk on Prices and Quantities of Energy Supplies," with J. Stiglitz, **Electric Power Research Institute Technical Report**, in four volumes, May 1978.

"Potential Competition and the Monopoly Price of an Exhaustible Resource," with S. Goldman, **Proceedings of the Lawrence Symposium on Systems and Decision Sciences**, October 1977, pp. 205-207; also published in **Journal of Economic Theory**, vol. 17, no. 2, April 1978, pp. 319-331.

"Resource Extraction with Differential Information," **American Economic Review**, Papers and Proceedings, February 1977, pp. 250-254.

"LSA Operation of Large Volume Bulk GaAs Samples," **IEEE Transactions on Electron Devices**, vol. Ed-14, no. 9, September 1967.