

**REPORT OF DENNIS CARLTON
REGARDING ICANN'S PROPOSED MECHANISM FOR
INTRODUCING NEW gTLDS**

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I. INTRODUCTION

A. QUALIFICATIONS

1. I am the Katherine Dusak Miller Professor of Economics at the University of Chicago Booth School of Business. I received my A.B. in Applied Mathematics and Economics from Harvard University and my M.S. in Operations Research and Ph.D. in Economics from the Massachusetts Institute of Technology. I have served on the faculties of the Law School and the Department of Economics at The University of Chicago and the Department of Economics at the Massachusetts Institute of Technology.

2. I specialize in the economics of industrial organization, which is the study of individual markets and includes the study of antitrust and regulatory issues. I am co-author of the book Modern Industrial Organization, a leading text in the field of industrial organization, and I also have published numerous articles in academic journals and books. In addition, I am Co-Editor of the Journal of Law and Economics, a leading journal that publishes research applying economic analysis to industrial organization and legal matters, and serve, or have served, as an editor of a variety of scholarly journals.

3. In addition to my academic experience, I am a Senior Managing Director of Compass Lexecon, a consulting firm that specializes in the application of economics to legal and regulatory issues. From October 2006 through January 2008, I served as Deputy Assistant Attorney General for Economic Analysis, Antitrust Division, U.S.

Department of Justice, the most senior position in the Antitrust Division held by an economist. I also served as a Commissioner of the Antitrust Modernization Commission, created by the U.S. Congress in 2002 to evaluate U.S. antitrust laws. I have provided expert testimony before various state and federal courts, the U.S. Congress, a variety of state and federal regulatory agencies and foreign tribunals and have served as a consultant to several government agencies including the Department of Justice and the Federal Trade Commission. My curriculum vita is attached as Appendix I to this report.

4. I have been asked by ICANN to analyze from an economic perspective ICANN's anticipated introduction of new generic top level domain names (gTLDs), and to identify and address the benefits and costs associated with ICANN's proposal. In doing so I evaluate various concerns that have been raised by the Antitrust Division of the U.S. Departments of Justice (DOJ), the National Telecommunications Information Agency (NTIA) of the U.S. Department of Commerce, and comments of third parties submitted to ICANN either in response to its proposal to introduce new gTLDs or in response to my previous two preliminary reports.¹ In conjunction with this analysis, I also address whether price caps that limit prices and future increases in prices charged by registries of these new gTLDs would be necessary to achieve the potential competitive benefits of the new gTLDs.

1. See letters from Deborah A. Garza to Meredith A. Baker dated December 3, 2008 ("DOJ letter") and from Meredith A. Baker to Peter Dengate-Thrush dated December 18, 2008 ("NTIA letter") The NTIA letter also requests information about the effect of new gTLDs on the stability and security of the Domain Name System, which are not addressed in this report. (http://www.ntia.doc.gov/reportsarchive_2007_2008.html) For comments received by ICANN see <http://forum.icann.org/lists/competition-pricing-prelim> and <http://forum.icann.org/lists/gtld-guide>.

5. This report combines and updates my two preliminary reports that address ICANN’s proposed mechanism for introducing new gTLDs.² This report also addresses in part certain comments made in response to my preliminary reports.

B. OVERVIEW AND SUMMARY

6. I conclude that ICANN’s proposed framework for introducing new gTLDs is likely to facilitate entry and create new competition to the major gTLDs such as *.com*, *.net*, and *.org*. Like other actions that remove artificial restrictions on entry, the likely effect of ICANN’s proposal is to increase output, lower price and increase innovation. This conclusion is based on the fundamental principles that competition promotes consumer welfare and restrictions on entry impede competition.

7. The DOJ, NTIA and a variety of other parties have expressed concerns that the introduction of new gTLDs could harm consumer welfare by creating confusion among consumers and imposing costs of trademark holders by necessitating inefficient “defensive” registration of domain names in new gTLDs. While entry generally promotes consumer welfare, proper account also must be taken for property rights that protect firms’ investments in establishing a reputation and brand name. If such property rights are not protected, rivals have an incentive to “free ride” on the reputation created by rivals by imitating trademarks or adopting very similar marks thereby potentially creating consumer confusion. In the absence of alternative mechanisms for protecting trademarks, the expansion in the number of gTLDs could impose costs on trademark

2. Preliminary Report of Dennis Carlton Regarding the Impact of New gTLDs on Consumer Welfare, March 2009, and Preliminary Analysis of Dennis Carlton Regarding Price Caps for New gTLD Internet Registries, March 2009.

holders by creating an incentive for them to undertake “defensive” registrations that serve no purpose other than protecting their intellectual property.

8. This possibility, and the harm to consumer welfare that results, is recognized by existing trademark law and in economic analyses of intellectual property. But to the extent that the introduction of new gTLDs gives rise to intellectual property concerns, they can be addressed through existing dispute resolution mechanisms and appropriately-designed modifications of ICANN procedures for protecting intellectual property. Given the availability of these alternative mechanisms for resolving trademark-related disputes, the draconian remedy of restricting entry would be likely to harm consumer welfare compared to approaches based on these alternatives.

9. DOJ, NTIA and other commenters suggest that action on ICANN’s proposal should be delayed until ICANN completes the economic study it authorized in 2006 to address whether the domain registration market is one economic market or whether each TLD operates as a separate market. While this remains an interesting question deserving of analysis, evaluation of the impact of ICANN’s gTLD proposal on consumer welfare does not depend on the answer to this question. Indeed, even if new gTLDs do not compete with *.com* and the other major TLDs for existing registrants, it is likely that consumers would nonetheless realize significant benefits from new gTLDs due to increased competition for new registrants and increased innovation that would likely be fostered by entry.

10. I also conclude that price caps or ceilings on prices charged by operators of new gTLD registries are not necessary to ensure that consumers benefit from new gTLDs. Proponents of price caps suggest that caps on prices charged for registrations on new gTLDs is necessary because trademark holders could be charged high prices to

protect their trademarks and due to concerns that registrants for new gTLDs could face high prices due to their high costs of switching to other registries.

11. However, the ability of ICANN to protect trademark holders through existing dispute resolution mechanisms and appropriately-designed modifications of ICANN procedures for protecting intellectual property implies that price caps are not necessary to protect trademark holders. In addition, the fact that registrants for new gTLDs face switching costs also does not provide a rationale for imposing price caps. The rates charged by new gTLDs will face competition from existing registries and other entrants, and operators of new gTLD registries that attempt to act opportunistically by subsequently raising prices face significant risk of harming their reputation and the loss of future customers. Further, the imposition of price caps for new gTLDs may inhibit the development and marketplace acceptance of new gTLDs by limiting the pricing flexibility of entrants to the provision of new registry services without generating significant benefits to registrants of the new gTLDs.

II. BACKGROUND ON ICANN'S PROPOSAL

A. ECONOMICS OF THE DOMAIN NAME SYSTEM

12. Despite the introduction of several new gTLDs in recent years, Internet activity today continues to be dominated by a small number of registries. For example, the *.com* TLD today has more than 80 million registered domain names while *.net* and *.org* respectively have roughly 12 million and 7 million registered domain names.³ While a handful of new gTLDs have been introduced in recent years, these have achieved only limited success in attracting registrants and Internet activity. For example, *.info* and *.biz*,

3. ICANN Registry Operator Monthly Reports January 2009.
(<http://www.icann.org/en/tlds/monthly-reports/>)

both introduced in 2001, have attracted roughly 5 million and 2 million domain names respectively.⁴

13. Currently, all agreements between ICANN and the registries operating unsponsored gTLDs include price maximums and limits on permissible future price increases that can be charged to registrars.⁵ Registrars, in turn, charge rates to registrants that are not regulated by ICANN. Registrars typically deal with multiple registries and offer a variety of additional services to registrants such as web site hosting and design.

14. Registrants that subscribe to a particular Internet domain name face costs when switching registries because the TLD is a component of the domain name which, by definition, cannot be ported across registries. That is, if the registrant that operates the website *cars.com* wants to switch to the *.net* registry, then it must adopt *cars.net* (if available) or adopt another *.net* domain name. Switching costs faced by registrants may create incentives for registries and registrars to act opportunistically by raising prices. However, ex ante competition to attract new registrants, as well as harm to the reputation of the registry and/or registrar, limits their ability to engage in such conduct.

15. An increase in the number of gTLDs increases the number of alternatives available to consumers, and thus offers the potential for increased competition, reduced prices, and increased output. The availability of new gTLDs also offers increased opportunities for registries and registrars to develop innovative services or business models that could provide significant opportunities for increases in consumer welfare.

4. Id.

5. See, e.g., Section 7.3 of *.com* Registry Agreement between ICANN and VeriSign, dated March 1, 2006. Unsponsored gTLDs (*.com*, *.biz*, *.info*, *.name*, *.net*, *.org*, *.pro*) have price caps; all sponsored gTLDs (*.aero*, *.asia*, *.cat*, *.coop*, *.jobs*, *.mobi*, *.museum*, *.tel*, *.travel*), which in most cases are smaller than the unsponsored gTLDs, have no price caps.

B. ICANN'S PROPOSED PROCEDURES FOR DEPLOYING NEW GTLDS

16. ICANN has proposed a framework for authorizing new gTLDs. ICANN's draft Guidebook for applicants details the various phases of the ICANN's review process and the requirements that need to be met for approval.⁶ ICANN will evaluate both the technical and financial capabilities of the applicant, the effect of the proposed gTLD on consumer confusion, and the effects of the proposed gTLD on Internet stability.⁷

17. Objections to gTLD applications can be filed by various parties including existing TLD registries, other applicants, holders of intellectual property rights (such as trademarks) and others.⁸ Objections can be made on a limited number of grounds including string confusion, legal rights (e.g. trademark infringement), morality and public order, and community objection.

18. ICANN has also initiated a process to address the concerns of trademark holders related to the introduction of new gTLDs. ICANN formed the Implementation Recommendation Team ("IRT") which has issued a report, discussed in more detail below, that contains recommendations relating to new trademark protection mechanisms to alleviate these concerns.

6. See ICANN, New gTLD Program: Second Draft Applicant Guidebook, February 18, 2009 ("Draft Guidebook"), (<http://icann.org/en/topics/new-gtlds/comments-2-en.htm>).

7. Draft Guidebook, p. 2-2.

8. A party that objects to an application must pay a dispute filing fee, which is expected to be between \$1,000 and \$5,000. At that time, the applicant has 30 days to respond (and pay the same fee). Both parties will then submit advanced payment to cover the dispute resolution proceedings, with payment refunded to the prevailing party (Draft Guidebook, p. 1-24 to 1-25).

C. SUMMARY OF CONCERNS ABOUT ICANN’S PROPOSAL TO EXPAND gTLDs.

19. The DOJ, NTIA and various other parties have expressed concerns that the introduction of new gTLDs could harm consumers and/or trademark holders. Broadly summarized, these comments reflect the view that the introduction of new gTLDs will harm consumers (registrants) by creating confusion and by imposing significant costs on trademark holders by forcing them to establish “defensive” registrations with the new gTLDs to protect their trademarks and existing domain names. Comments by the DOJ and other parties also claim that the introduction of new gTLDs might not result in increased competition that would lower prices or improve service to registrants.⁹

20. For example, the Association of National Advertisers states that new gTLDs will generate higher “costs of brand management and create new opportunities for others to infringe, phish, and engage in other deceptive practices. As a result, brand owners and consumers will be net losers.”¹⁰ Similarly, the U.S. Chamber of Commerce concludes that, “the proposed gTLD program [...] will compel businesses to invest millions of dollars in defensive domain registrations and litigation [...]”¹¹ The Kende

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9. AT&T expresses similar concerns in their economic report that responds to my two preliminary reports. See Michael Kende “Assessment of ICANN Preliminary Reports on Competition and Pricing”, April 17 2009 (“Kende Report”) submitted on behalf of AT&T. I am preparing a separate report that addresses aspects of the Kende Report.
10. ANA letter, p. 1. (<http://forum.icann.org/lists/gtld-guide/mail2.html>) “Phishing” is “a computing scam where the perpetrators try to get sensitive personal information by sending users to fake, but legitimate looking websites.” (Source: <http://onlinebusiness.about.com/od/onlinebusinessglossary/g/phishing.htm> accessed on February 17, 2008)
11. U.S. Chamber of Commerce letter, p.1. (<http://forum.icann.org/lists/gtld-guide/index.html>)

Report claims “that the proposed introduction of new gTLDs could bring significant additional costs and resource burdens.”¹²

21. The DOJ concludes that “the need of many registrants to purchase domains in many or most gTLDs allows each gTLD registry operator to impose costs on registrants that purchase domains simply because a gTLD exists. [...] In light of these findings, we believe that the introduction of new gTLDs under the RFP could impose substantial additional domain registration costs on many consumers and that many new gTLD registry operators may have market power over registrants.”¹³ The Kende Report also suggests regulating registry prices as registries of new gTLDs could extract high payments from trademark owners because “defensive registrations are much less price sensitive than basic new registrations”.¹⁴

22. In addition, both the NTIA and DOJ also express concerns regarding ICANN’s proposed application and review process itself. Due to concerns that even new gTLDs have market power over its registrants, both DOJ and NTIA recommend ICANN use competitive bidding in assigning new TLDs, with applicants submitting bids that specify maximum prices and permissible price increases.¹⁵ The DOJ and NTIA further recommend that, in instances in which competitive bidding may not be effective, ICANN incorporate provisions directly into their agreement with new registries, such as price restrictions or requirements of long-term contracts with users, to prevent the exercise of

12. Kende Report, p.11.

13. DOJ letter, p. 3.

14. Kende Report, p.12

15. DOJ letter, p.7 and NTIA letter, p.2.

market power.¹⁶ Finally, the DOJ suggests that ICANN require periodic competitive bidding for renewal of registry agreements.¹⁷

III. CONSUMERS ARE LIKELY TO BENEFIT FROM THE INTRODUCTION OF NEW GTLDS.

23. The comments by NTIA, DOJ, and others appropriately focus on the impact of new gTLDs on consumer welfare, but I believe come to the wrong conclusion.¹⁸ This section shows that, given the availability of alternative mechanisms to address concerns about consumer confusion and defensive registrations, which are discussed below, ICANN's plan to introduce new gTLDs is likely to benefit consumers by facilitating entry which would be expected both to bring new services to consumers and mitigate market power associated with *.com* and other major TLDs and to increase innovation. As a result, the proposal by DOJ, NTIA and others to delay or even preclude deployment of new gTLDs is likely inconsistent with consumer interests. I conclude that such output restrictions are unnecessary and that the concerns motivating these restrictions can be addressed without resorting to draconian restrictions on entry, which essentially would freeze the number of TLDs less than fifteen years after the first commercial development of the Internet.

16. I understand that the current proposed agreement between ICANN and new gTLD registries contains a requirement for registries to offer a 10-year registration option to registrants.

17. DOJ letter, p.7 and NTIA letter, p.2.

18. DOJ letter, p. 2, "...ICANN's general approach to new gTLDs should be revised to give greater consideration to consumer interests. ICANN should more carefully weigh potential consumer harms against potential consumer benefits..."

A. POLICIES THAT FOSTER ENTRY HELP ADDRESS CONCERNS ABOUT MARKET POWER ASSOCIATED WITH .COM, AND OTHER MAJOR TLDS

24. The DOJ and others have expressed concern that *.com* and other gTLDs possess market power.¹⁹ To the extent they do, however, ICANN’s proposal to expand the number of TLDs available could serve to limit any such concern. As the Horizontal Merger Guidelines note, entry has the potential to “counteract the competitive effects of concern.”²⁰ More generally, entry is recognized to play a central role in maintaining competitive markets.²¹ Hence, to the extent that *.com* and other TLDs have any market power today, expansion of the number of TLDs could constrain it in the future.

25. DOJ claims that “... the creation of additional gTLDs is unlikely to constrain the exercise of market power by existing TLDs...”²² The DOJ, however, seems to focus on the effect of new TLDs on existing registrants, not on their impact on competition for new registrants. The DOJ, for example, speculates that “the network effects that make *.com* registrations so valuable to consumers will be difficult for other TLDs to overcome.”²³ However, any market power associated with *.com* will attract entrants with strategies built around bringing new registrants to the new gTLDs. Restricting the opportunity for entrants to compete for such profits necessarily has the effect of protecting and preserving the profits of the *.com* registry and its registrars.

26. Both economic theory and empirical evidence indicate the elimination of entry barriers is likely to have a number of beneficial effects on consumer welfare,

19. See, e.g., DOJ letter, p. 3 and Kende report p17.

20. Horizontal Merger Guidelines of the U.S. Department of Justice and Federal Trade Commission, p. 25.

21. See Carlton, *Modern Industrial Organization*, 4th ed., pp. 77-82.

22. DOJ letter, p. 1.

23. DOJ letter, p. 2.

including lower prices, expanded output, and increased innovation. The benefits of entry are the increased set of alternatives available to consumers and, more generally, the increased the elasticity of demand faced by existing firms creating an incentive for them to reduce their price. Consumer welfare is enhanced because product variety increases and output expands, resulting in an increase in consumer surplus. An empirical analysis of the effect of entry of new gTLDs, such as *.info* and *.biz*, on output and pricing would likely contribute to our understanding of the effects of entry on consumer welfare, but, as explained below, even if such a study indicated that this entry did not result in a reduction in *.com* registrations or fees, this would not lead to the conclusion that entry was not beneficial.²⁴

27. The DOJ suggests that new gTLDs may not provide substantial competition for *.com* and other existing TLDs, stressing the ubiquity of *.com* and the fact that that *existing* registrants face significant costs of switching to another TLD. Even if this is the case, this logic does not extend to competition between *.com* and new gTLDs to attract *new* registrants. The increase in the number of alternatives available to new registrants provides an incentive for registries for both new and existing gTLDs to reduce prices, improve service quality, and offer innovative services as they compete for new registrants. Note that this benefit holds even if *.com* pricing continues to be regulated through price caps because competition has the potential for inducing registries of regulated TLDs to reduce prices below these caps and to develop new and improved services.

24. The data on registrations and price necessary to perform such a study are maintained by registries, not by ICANN.

28. Furthermore, even if entry of new gTLDs did not affect the prices charged by .com and other existing TLDs, entry would still be likely to increase consumer welfare, which NTIA and DOJ appear to ignore. When registrants select a new gTLD instead of an existing one, they reveal that they are better off due to the expansion in the number of available alternatives. That is, the expansion in the number of available alternatives (including both TLDs and the second-level names) alone is itself likely to increase consumer welfare.

29. Removing entry barriers also is likely to foster innovation. In the absence of competition from new gTLDs, registries and registrars that serve .com and other major TLDs face limited incentives to develop new technologies and/or improved services that may help attract new customers. However, absent restriction on new gTLDs, potential new entrants will be motivated to develop new technologies and methods as a way to overcome .com's first mover advantage. This, in turn, increases the incentives to innovate faced by registrars of .com and other incumbent registries as they strive to sign up new registrants.²⁵

30. A variety of innovations are likely to be facilitated by expansion of the number of gTLDs. For example:

- A gTLD dedicated to serving the financial services industry might require registrants to provide secure transactions. The certification provided in the gTLD name thus provides valuable information to consumers who desire secure financial transactions over the Internet.

25. See Carlton and Perloff, *Modern Industrial Organization*, 4th ed. p. 564.

- A new gTLD may offer International Domain Names so that a URL (e.g., <http://www.google.com>) can be presented in the language of the region, facilitating the provision of products by registrars in multi-language services.
- New gTLDs are expected to focus efforts at serving high targeted markets, such as the customers and suppliers of a given firm while others, perhaps, will focus on serving a variety of registrants in a given geographic area.²⁶

31. As these examples suggests, many of the benefits of new gTLDs can be realized even if the new gTLD would not compete today on price with existing TLDs. For example, expansion in the number of gTLDs that fostered increased innovation or simply expanded aggregate Internet registrations and utilization would generate improvements in consumer welfare even if the new gTLDs operated in antitrust markets that are distinct from *.com*. Of course, potential consumer confusion could be reduced to a minimum by having only a single gTLD (*.com*), but it is unlikely that this would be in consumers' interest. I discuss this issue in more detail below.

32. DOJ expressed concern that “some new gTLDs envisioned by the RFP likely would have market power...”²⁷ However, even if true, this fact alone again does not provide a basis for restricting entry. Even if certain new gTLDs possessed some market power, allowing their entry would still enhance consumer welfare, just as entry which results in the creation of a duopoly from a monopoly enhances consumer welfare even though both duopolists typically will have market power. To illustrate this point,

26. Connecting.NYC Inc. letter to ICANN (<http://forum.icann.org/lists/gtld-guide/index.html>).

27. DOJ letter, p.1.

imagine an industry with several differentiated products, each of which has some market power. It is inconceivable that anyone would find it generally desirable to restrict entry into such an industry based on the view that entry will fail to erode the market power of existing products.

B. NEW gTLDs ARE LIKELY TO BENEFIT CONSUMERS EVEN IF THEY DO NOT COMPETE DIRECTLY WITH .COM.

33. New gTLDs also can enhance consumer welfare by providing information to Internet users that facilitates navigation of the Internet, even if the new gTLDs have limited substitutability with *.com*. This is due to the likelihood that new gTLDs will be designed to serve consumer needs that *.com* does not meet well. For example, because domain names contain information content that is of value to consumers, some new gTLDs may facilitate consumers' Internet navigation and search by more rapidly directing them to websites with the desired content. For example, company-specific TLDs (e.g., *.Ford*) may facilitate the ability of Ford customers to obtain product information as well as the interaction of suppliers and dealers with Ford. Similarly, new generic TLDs, like *.cars*, may facilitate the ability of consumers to obtain both generic information about cars as well as the ability to access the websites of car manufacturers, suppliers, and other car consumers that use this gTLD to host their websites.

C. EVALUATION OF ICANN'S PROPOSAL DOES NOT REQUIRE DETAILED STUDY OF SCOPE OF COMPETITION AMONG TLDs.

34. As noted above, both the DOJ and NTIA recommend that ICANN should postpone the introduction of new gTLDs until it studies the scope of competition among TLDs along the lines that the ICANN Board proposed in 2006.²⁸ At that time, ICANN

28. See DOJ letter, p. 6 and NTIA letter, p. 1.

proposed to analyze, among other things: (i) whether each TLD functions as a distinct economic market; (ii) the effects of switching costs involved in moving from one TLD to another; and (iii) the effect of the existing TLD structure on the pricing by entrants.

35. While these issues are of economic interest, analysis of these questions is not necessary for evaluating ICANN's gTLD proposal. Even if *.com* (or any other TLD) today exercises market power, there is no basis to conclude that new gTLDs would not enhance consumer welfare by creating new products and fostering innovation, and would likely promote future competition with *.com* and other TLDs. In addition, the concerns about consumer confusion, cybersquatting and the potential for new gTLDs to motivate new defensive registrations also arise whether existing TLDs constitute distinct antitrust markets or whether they are appropriately considered to be part of a broader market.

D. REQUIRING PROOF OF COMPETITIVE BENEFITS BEFORE AUTHORIZING ENTRY IS LIKELY TO HARM CONSUMER WELFARE.

36. Parties that have commented on ICANN's proposal, including DOJ and NITA, suggest that due to the presence of potential costs to trademark holders and others posed by new gTLDs, the competitive benefits of new gTLDs should be proven before ICANN authorizes their use.²⁹ For example, NTIA states that "[i]t is unclear that the threshold question of whether the potential consumer benefits outweigh the potential costs has been adequately addressed and determined."³⁰ This approach is inconsistent with the widely-held view, described above, that the entry benefits consumers by expanding output and lowering price.

29. See, e.g., DOJ letter, p. 2, NTIA letter, p. 1 and comment submitted by AT&T to ICANN on December 15, 2008 (<http://forum.icann.org/lists/gtld-guide/>).

30. NTIA letter, p. 1.

37. Restricting ICANN's ability to expand the number of gTLDs is economically efficient only if costs from new gTLDs, including increased consumer confusion and/or higher costs of monitoring and enforcing trademarks, exceeds the potential benefits to consumers from new gTLDs, which likely include lower prices for domain names, increased output, and increased innovation. As noted above, many of these benefits of new gTLDs and domains established on those gTLDs can be realized even if the new gTLDs do not compete with existing TLDs.

38. Requiring entrants to justify entry on a cost/benefit basis, however, is likely to result in significant consumer harm because the competitive benefit of new business methods or technologies facilitated by entry can be very hard to predict *a priori*. Economic literature shows that innovations are a principal source of the growth in GNP and consumer welfare over time. Most notably, Robert Solow, who was awarded the 1987 Nobel Prize in Economics for his work on the sources of economic growth, noted in his Nobel Prize lecture that “the rate of growth...depends entirely on the rate of technological process.”³¹ Following in this tradition, in their well-known book, *Innovation and Growth in the Global Economy*, Gene Grossman and Elhanan Helpman describe innovation as “the engine of long-run growth.”³²

39. Economic literature also stresses that innovations and new products generate large increases in consumer welfare, while regulatory policies that limit or delay entry and the spread of innovation can substantially reduce welfare. As part of his extensive research on the consumer welfare gains generated by new goods, Jerry

31. Robert M. Solow, Nobel Prize Lecture, December 8, 1987.

32. Gene Grossman and Elhanan Helpman, 1993, *Innovation and Growth in the Global Economy*, p. 18.

Hausman has found that “the introduction of cellular telephone services has led to gains in consumer welfare which now exceed \$25 billion per year,” and that the consumer welfare cost of the regulatory delay of this introduction was close to \$100 billion.³³ In their volume “The Economics of New Goods,” Timothy Bresnahan and Robert Gordon review the economic literature and conclude, “[c]learly, new goods are at the heart of economic progress.”³⁴ In his 2002 paper on consumer welfare gains resulting from the introduction of the minivan, Amil Petrin notes that “...large improvements in consumers’ standard of living arise from competition as firms cannibalize each other’s profits by seeking new goods that give them some temporary market power.”³⁵

40. As this suggests, restrictions on entry are likely to promote consumer welfare under only very unusual circumstances. The imposition of such restrictions, however, is likely to benefit existing market participants by limiting competition from firms offering innovative services and new business models. Actions that protect any market power that .com and other gTLDs may possess are unlikely to benefit consumers.

IV. CONCERNS EXPRESSED ABOUT TRADEMARK PROTECTION DO NOT SUPPORT RESTRICTIONS ON ENTRY.

41. As noted above, the DOJ and others argue that trademark holders will perceive the need to register domain names with new gTLD registries solely for defensive purposes, in order to avoid costs associated with improper use by others of the their trade name.³⁶ That is, the DOJ and others argue that entry should be restricted because such competition may increase trademark holders’ costs of protecting their

33. Jerry Hausman, 1998, “New Products and Price Indices,” NBER Website, http://www.nber.org/reporter/fall98/hausman_fall98.html.

34. Timothy Bresnahan and Robert Gordon, 1997, *The Economics of New Goods*, p. 1.

35. Amil Petrin, 2002, “Quantifying the Benefits of New Products: The Case of the Minivan,” *Journal of Political Economy*, p. 705.

36. See, e.g. DOJ letter, p. 5.

intellectual property. This section shows that while costs associated with defending trademarks are real, other mechanisms other than preventing entry are available to address these concerns and that these alternatives can preserve the benefits of increased competition resulting from entry.

A. THE ECONOMIC RATIONALE FOR TRADEMARK PROTECTION DOES NOT JUSTIFY RESTRICTING ENTRY OF NEW GTLDS.

42. Domain names help reduce the costs of searching for information available on the Internet and registrants select domain names to help attract consumers to their sites.³⁷ Thus, registrants face concerns that other similarly-named sites may create confusion, raise search costs faced by consumers, free ride on the registrant's reputation, and harm the registrant's ability to attract traffic.

43. As this suggests, the economic function of domain names is related to the economic function of trademarks, which also protect the trademark holder's intellectual property by preventing confusion created by rivals' efforts to free ride on the trademark holder's reputation. Similarly, registrants have a significant interest in protecting their domain names from imitation and free riding by others that attempt to utilize a trade name that is protected or that is confusingly similar to a protected trademark.

44. In analyzing the economic function of trademarks, William Landes and Richard Posner explain that:

...a trademark is a word, symbol, or other signifier used to distinguish a good or service produced by one firm from the goods or services of other firms. To perform its naming function a trademark or brand name...must not be duplicated. To allow another maker of decaffeinated coffee to sell its coffee under the name "Sanka" would destroy the benefit of the

37. Improvements in search engines could provide another valuable method by which consumers can identify and find websites.

name...If the law does not prevent it, free riding may destroy the information capital embodied in a trademark, and the prospect of free riding may therefore eliminate the incentive to develop a valuable trademark in the first place.³⁸

45. “Generic” terms, however, generally cannot be trademarked.³⁹ As defined by Landes and Posner, “[a] generic name or term is by definition the name not of a brand but of an entire product: ‘airplane’ and ‘computer’ are examples.”⁴⁰ The lack of legal protection for generic terms is consistent with principles of economic efficiency because granting trademarks for such terms to one firm can raise search costs faced by consumers and hinder competition from other firms. Granting legal protection for generic terms also serves no purpose in protecting incentives for firms to invest in creating a reputation and information capital in the term. As Landes and Posner explain:

... if a single firm is given the exclusive right to use the word or words that identify an entire product, as distinct from an individual brand of the product, competition with other firms that make the same product will be impaired. Thus, if a particular manufacturer of personal computers could not use the terms “personal computer” or “PC” in its advertising or labeling because another firm had the exclusive rights to these terms, it might have to describe its product as “a machine capable of doing word processing and high-speed calculations and other data manipulations, using a central processing unit,” etc...Because it is harder to recall long than short phrases, a lengthy description may well convey less usable information about the firm’s product than a single word or a short phrase, so search costs will rise.⁴¹

46. Internet domain names can be based both on trademarks (e.g., *Ford.com*) and generic terms (*cars.com*), and the new gTLDs that would be permitted under

38. W. Landes and R. Posner, *The Economic Structure of Intellectual Property Law*, Belknap Press of Harvard University Press (2003), pp. 166-168.

39. Landes and Posner, Chapter 7, p. 190. There are exceptions to this general statement. For example, a term can be generic in connection with some goods (and thus not be protected) but can be trademarked for its use in connection with other goods. For example, the word “apple” is generic when applied to fruit but can be trademarked when applied to computers.

40. Landes and Posner, pp. 190-91.

41. Landes and Posner, p. 175.

ICANN's proposal also may include both trademarks (*.Ford*) and generic terms (*.cars*). Economic evaluation of ICANN's proposal raises distinct issues for gTLDs that use generic terms and trademarks and reflects the competing interest of protecting intellectual property of trademark holders and promoting the unrestricted use of generic terms.

47. Trademark protection extends to domain names so, for example, only Ford has the ability to use and/or prevent others from using domain names such as *Ford.com* and, similarly, register *.Ford* as a gTLD.⁴² Congress enacted the Anti-Cybersquatting Consumer Protection Act in 1999 to clarify the role of trademarks in domain names and to prevent "cybersquatting," (i.e., attempts by firms to acquire domain names, including those involving trademarks, for the purpose of reselling them to trademark holders). ICANN also has established mechanisms for resolving domain name disputes that arise in the existing gTLDs; for example, in 1999 it established the its Uniform Dispute Resolution Policy in 1999 which set procedures for resolving disputes over domain names.⁴³ As discussed further below, ICANN has also initiated a process to address the concerns of trademark holders and improve the mechanisms for resolving disputes about the use of trademarks in domain names.

48. Nonetheless, as various comments on ICANN's gTLD proposal emphasize, trademark holders still expend effort to monitor unauthorized use of their marks and to enforce their property rights. Many trademark holders are concerned that the introduction of new gTLDs will require additional costs related to monitoring and enforcing the use of these trademarks, including entering into "defensive" registrations

42. Anti-Cybersquatting Consumer Protection Act, November 1999.

43. Under these procedures, an objector files a complaint with an ICANN-approved dispute resolution service provider which follows ICANN-specified policies and procedures for addressing the complaint.

that serve no efficiency-enhancing purpose and are undertaken only to protect the trademark holder's intellectual property.⁴⁴ At the same time, however, it is important to note that registrants that use generic terms in domain names also have a private interest to restrict competition by limiting the use of these terms by rivals in domain names and gTLDs, although there is limited potential benefit in terms of reduced monitoring and enforcement costs in such circumstances from limiting the use of generic terms.

49. Indeed, a significant potential benefit of the introduction of new gTLDs would be to facilitate expansion in the use of generic terms in domain names. As discussed above, the use of such terms can promote consumer welfare by reducing search costs faced by Internet users. For example, the establishment of *.cars* as a gTLD is likely to facilitate the ability of Internet users to identify information related to automobiles and is likely to help registrants in attracting Internet visitors.

B. ENTRY RESTRICTIONS ARE LIKELY TO BE AN INEFFICIENT MECHANISM FOR PROTECTING TRADEMARKS.

50. While protecting trademarks and intellectual property promote consumer welfare, economic efficiency requires that trademark holders be protected at the minimum possible cost. Entry restrictions are unlikely to be the most efficient way of protecting trademark holders.

51. Mechanisms currently exist for protecting the use of trademarks in domain names. As mentioned previously, in addition to trademark law, ICANN maintains the UPRP for resolving claims that a registrant owns a domain name that infringes an existing trademark. While a large number of disputes are routinely resolved under these

44. See, e.g., comments submitted by Microsoft and US Telecom to ICANN, December 15, 2008 (<http://forum.icann.org/lists/gtld-guide/>).

procedures, and there may be dissatisfaction with these rules by trademark holders, entry restrictions are an extreme approach to addressing trademark concerns when alternative approaches, such as modifying existing dispute resolution mechanisms, may also help achieve these goals while preserving the benefits of entry to consumers.

52. For example, the economic literature shows that frivolous requests for gTLDs and/or frivolous challenges of new names can be deterred by requiring the party that loses a challenge to bear the legal cost of both parties. Under such “loser pays” rules, a non-trademark holder that attempted to obtain a domain name or a gTLD based on a trademark would need to pay the legal fees of the trademark holder and related administrative fees if the trademark holder successfully challenges the domain name or gTLD. Such a rule would deter frivolous attempts by non-trademark holders to obtain domain names that are based on trademark terms or are confusingly similar to such terms as well as the need for defensive registrations.⁴⁵ Under a more extreme version of the “loser pays” rule, parties with domain names found to violate a trademark can be assessed a penalty.⁴⁶

53. In addition, ICANN has undertaken a process to evaluate concerns of trademark holders by eliciting recommendations for improving mechanisms for protecting trademark holders’ property that help prevent the unauthorized use of trademarks in domain names. In March 2009, ICANN formed the IRT whose purpose is to consider and recommend proposals to help protect the legal rights of trademark owners

45. J. Hughes and E. Snyder, “Litigation and Settlement Under the English and American Rules: Theory and Evidence,” 38 J. Law and Econ. 225 (1995).

46. To ensure that firms have sufficient funds to pay penalties, ICANN could require that a bond be posted at the time a dispute is filed or a domain is registered.

focusing on, but not limited to, issues arising with respect to the introduction of new gTLDs.⁴⁷

54. The IRT recently has issued a report which proposes new mechanisms for protecting trademark holders. These include: creating a centralized intellectual property clearinghouse to support new gTLD registries; instituting a mechanism for blocking registration of domain names with certain globally protected trademarks (those contained in the Globally Protected Marks List) in both the top and second level domain name space; and creating a venue for expedited proceedings for blatant trademark infringement and abuse. The IRT's recommendations to the ICANN Board are currently under review, and further public comment is anticipated.

55. Finally, the expansion in the number of TLDs under ICANN's proposal would appear to raise no new issues relating to enforcing and monitoring trademarks that do not arise under the existing domain name system. For example, consider Ford's attempt to protect its domain name *Ford.com*. There are already numerous alternative names it maintains and monitors, including *Fordvehicles.com*, *Lincoln.com*, etc. It is unclear how much the introduction of a new gTLD – say, *.cars* designed for sites related to car – would further increase the required effort and associated costs of monitoring use of Ford marks. The introduction of Ford trademarks in the *.cars* gTLD raises the same concern as in other gTLDs and thus appears to raise no new issues relating to the identification or monitoring of trademarks in domain names.

47. IRT Report (<http://www.icann.org/en/announcements/announcement-4-29may09-en.htm>)

C. OPPONENTS APPEAR TO OVERSTATE THE MAGNITUDE OF THE “DEFENSIVE REGISTRATION” CONCERNS.

56. While concerns regarding the impact of gTLDs on the need for “defensive registrations” merit close attention, relatively little is known about the extent of such registrations. AT&T’s economic report claims to document the extent of “defensive registrations” but appears to overstate the magnitude of such concerns. More specifically, the Kende Report presents data from MarkMonitor for five “representative” firms, suggesting that well over 99 percent of the registrations of these firms are “defensive.” Dr. Kende defines defensive registrations as those which “redirect traffic to a core registration” and claims that these serve no purpose other than to “prevent a cybersquatter from registering them.”⁴⁸

57. However, many registrations that “redirect traffic” to other sites serve productive purposes of attracting and retaining Internet traffic, not merely to prevent cybersquatting. Dr. Kende fails to distinguish between these alternative types of “defensive” registrations.⁴⁹ For example, the following types of registrations that direct traffic to other sites would help attract traffic and would not be maintained simply to prevent cybersquatting:

48. Kende Report, p.7. More fully, Dr. Kende defines defensive registrations as follows: “Defensive Registration: These registrations are not unique, in that they do not resolve, or they redirect traffic back to a core registration, or do not contain unique content – for instance registrations that contain typos of a trademarked name. These are registered to prevent a cybersquatter from registering them instead, or are recovered from cybersquatters who registered them first.”

49. Dr. Kende has not produced the data or survey forms that provide the basis of his analysis. As a result, it is unclear whether survey respondents consider all registrations that merely redirect traffic to other domains as unproductive “defensive” investments or whether this is Dr. Kende’s interpretation.

- Registrations involving trademark names that direct traffic to the website of a corporate parent;
- Registrations involving trademark names no longer in active use;
- Registrations involving trademark names not currently used that may be used in the future;
- Registrations involving common misspellings that redirect traffic to the core site.

58. To take just one small example, my own firm – Compass Lexecon – currently maintains several dozen registrations in addition to *compasslexecon.com*. These include *compass.com* and *lexecon.com*, which were the registrations maintained by the two companies that merged to form Compass Lexecon.⁵⁰ These domains do not currently host content but instead route traffic to *compasslexecon.com*. Maintaining these registrations prevents the potential loss of traffic generated by individuals who may not be aware of the firm’s name change. However, these would be considered unproductive “defensive registrations” under the standard adopted by Dr. Kende.

59. There are a myriad of reasons that firms maintain “defensive” registrations that have little to do with trademark protections.⁵¹ There is no doubt that some registrations are made to prevent trademark abuse. However, Dr. Kende’s failure to distinguish “defensive registrations” designed to prevent cybersquatting alone from those that help attract and maintain Internet traffic (while redirecting it to another site) in

50. In addition, Compass Lexecon maintains a variety of .cc registrations and related registrations that direct traffic to the *compasslexecon.com* site.

51. To cite one additional example, firms may register a variety of “reverse zone” domain names for monitoring the source of Internet traffic. These would be classified as “defensive” by Dr. Kende but are wholly unrelated to trademark protection.

summarizing the MarkMonitor data exaggerates the adverse consequences of ICANN's gTLD proposal.

60. In addition, the relatively limited success of new TLDs such as *.info* and *.biz* suggests that defensive registrations are less important than suggested by AT&T and other commenters. Since their introduction in 2001, *.info* has attracted 5 million registrants and *.biz* has attracted 2 million, far below the roughly 80 million registrants using *.com*.⁵² While some of the registrations for domain names under the new gTLDs may have been made for defensive purposes, the limited number of registrations for new gTLDs indicates that the vast majority of *.com* registrants did not find a compelling reason to undertake defensive registrations in the new gTLDs.

V. PRICE CAPS ARE UNLIKELY TO GENERATE SIGNIFICANT CONSUMER BENEFITS.

61. Various parties have suggested that new gTLDs be subject to price caps similar to those faced by *.com* and other major non-sponsored TLDs such as *.net*, *.org*, *.info*, *.biz* and others.⁵³ The two main concerns motivating this proposal are: (i) that trademark owners' can be charged supracompetitive prices for defensive registrations, and (ii) that incumbent registrants can be charged supracompetitive prices as a result of costs they face from switching to another registry. This section shows that both of these concerns are misplaced.

A. THE AVAILABILITY OF ALTERNATIVE MECHANISMS OF PROTECTING TRADEMARK HOLDERS IMPLIES THAT PRICE CAPS ARE NOT NECESSARY TO PROTECT CONSUMERS.

62. DOJ and other suggest that price caps on new gTLDs are appropriate because new gTLDs will be able to charge supracompetitive prices because the demand

52. ICANN Registry Operator Monthly Reports, January 2009.

53. See e.g. NTIA Letter, p.2 and DOJ Letter p.7

for defensive registrations is likely to be “highly inelastic.”⁵⁴ However, the demand for such registrations is likely to be highly inelastic only if dispute mechanisms for enforcing property rights are ineffective.

63. As discussed above, mechanisms are already in place for resolving disputes, and ICANN has been actively engaged in proceedings designed to modify and improve these mechanisms. In the presence of appropriately designed proposals to protect trademarks, there is no reason to expect that new gTLDs will be able to charge excessive prices, and no need to impose price caps. As discussed in more detail below, the imposition of price caps is likely to discourage investment in new gTLDs and discourage experimentation with new business models with the potential to challenge *.com* and other major TLDs for new registrants.

B. SWITCHING COSTS CREATE INCENTIVES FOR “EX ANTE” COMPETITION AMONG SUPPLIERS.

64. Registrants that adopt a particular Internet domain name face costs from switching registries because the use of the TLD in the domain name prevents Internet addresses from being ported across registries. That is, the holder of a domain name that wants to switch registries must, at a minimum, adopt a new TLD. Switching costs arise for a variety of products and industries and the existence of such costs can make customers, to some degree, beholden to their suppliers. This can create an incentive for registry operators to act opportunistically by raising prices after a registrant obtains a new domain name above levels registrars might reasonably expect at the time they obtain their domain name. Proponents of incorporating price caps for registry services into registry

54. Kende Report, p. 12.

contracts might argue that such caps eliminate the risk of such opportunistic behavior by registries.

65. However, competition among suppliers to attract new customers in markets characterized by switching costs limits or eliminates the suppliers' incentive and ability to act opportunistically. For example, a supplier that imposes unexpected or unreasonable price increases will quickly harm its reputation making it more difficult to continue to attract new customers. Therefore, even in the absence of price caps, competition can reduce or eliminate the incentive for suppliers to act opportunistically.

66. The economic literature recognizes the role of "ex ante" competition in discouraging opportunistic behavior by suppliers of products that embody switching costs. For example, a leading academic study of switching costs notes:

The monopoly power that firms gain over their respective market segments leads to vigorous competition for market share before consumers have attached themselves to suppliers.⁵⁵

67. The economic literature further recognizes that a firm that acts opportunistically in dealing with customers facing switching costs is likely to suffer harm to its reputation, which limits its ability to attract new customers in the long-run:

... every seller has "captive" buyers in the short run. We should not worry about slight degrees of monopoly power; the free market will take care of them faster than antitrust law could do. The seller who exploits its "monopoly" over replacement parts will find himself without many purchasers of his original equipment in the next period.⁵⁶

55. Klemperer, Paul. "Markets with Consumer Switching Costs" *Quarterly Journal of Economics* 102 (1987), 375-394, p. 377. I reached similar conclusions in my own analysis of the *Kodak* case. Carlton, Dennis. "A General Analysis of Exclusionary Conduct and Refusal to Deal – Why *Aspen* and *Kodak* are Misguided," *Antitrust Law Journal* 68 (2001), 659-683, p. 679.

56. Posner, Richard. *Antitrust Law*, 2nd Edition. Chicago: University of Chicago Press, 2001, p. 230.

68. This sentiment is also echoed by Carl Shapiro (1995), the current Deputy Assistant Attorney General in the Antitrust Division of the U.S. Department of Justice, in his analysis of the U.S. Supreme Court's decision in *Eastman Kodak Co. v. Image Technical Services, Inc.*⁵⁷ This case involved claims that Kodak violated antitrust laws by limiting its customers' ability to obtain replacement parts from firms other than Kodak. Shapiro concludes that suppliers in growing markets face the strongest incentives to preserve their reputation and thus to avoid opportunistic behavior.⁵⁸ This is because, in a growing market, an opportunistic firm risks greater future losses than do similar firms in stable or declining markets. Thus, the rationale for imposing price caps is weakest in rapidly growing industries.

69. Ex ante competition serves to protect both uninformed consumers, which face greater risk of opportunistic price increases, as well as better informed consumers because both sets of consumers pay the same prices. In addition, other contractual mechanisms can be negotiated to avoid opportunistic behavior by suppliers. For example, firms and customers may enter into long-term contracts with renewal provisions that specify a supplier's ability to change prices over time.

C. COMPETITION AMONG EXISTING AND NEW TLD REGISTRIES LIMITS CONCERNS ABOUT OPPORTUNISTIC BEHAVIOR.

70. As early as 1998, the Federal Trade Commission ("FTC") concluded that the existence of switching costs faced by holders of domain names did not raise a significant impediment to the privatization of the Internet Domain Name System. In

57. Shapiro, Carl. "Aftermarkets and Consumer Welfare: Making Sense of *Kodak*," *Antitrust Law Journal* 63 (1994), 483-511.

58. Shapiro (1994), p 490.

response to the National Telecommunications and Information Administration's request for comments on this issue, the FTC concluded:

It would appear plausible that the absence of domain name portability across registries could impose a switching cost on users who change registries... It is theoretically possible, therefore, that a supplier could raise the future prices to locked-in customers...

The economic analysis of markets with switching costs has identified a number of factors that, in appropriate circumstances, can diminish the ability and the incentive of a supplier to act opportunistically with respect to its locked-in customers....

Overall, we would conclude that while the possibility of supplier opportunism exists, the potential benefits to customers from enhanced competition – such as possible price reductions and quality improvements – argue in favor of [assignment of registries to for-profit firms].⁵⁹

71. Today, competition among a variety of TLDs reduces concerns about opportunistic behavior by new gTLD registries that may result from switching costs faced by registrants of new domain names. First, new gTLD registries face competition from a wide variety of alternatives, including the major existing TLDs (.com, .net, .org), less established existing TLDs (e.g., info, .biz), country-code TLDs, sponsored TLDs (such as .museum, .aero), and other new gTLD entrants. The existence of these alternatives implies that new gTLDs are unlikely to be successful in attracting a significant number of new registrants if they engage in opportunistic behavior that harms their reputation. Under these circumstances, price caps are not necessary to protect registrants using the new gTLD registries.

72. Concerns about opportunistic behavior by registry operators are further limited to the extent that new gTLDs provide services using existing registrars. It would

59. Comment of the Staffs of the Bureaus of Economics and Competition of the FTC – In the Matter of Improvement of Technical Management of Internet Names and Addresses” March 23, 1998, p. 3-4.

be expected that registrars' on-going involvement in the provision of domain-name related services leaves them well informed about potentially opportunistic behavior by registry operators and in a position to shift potential customers away from new gTLDs that act in this manner.

73. The fact that the existing major TLDs are currently subject to price caps further constrains the ability of new gTLD registry operators to charge non-competitive prices. More specifically, the current agreements between the U.S. Department of Commerce, ICANN, and VeriSign cap the price increases that VeriSign can charge registrars for the .com and .net TLDs. Several other non-sponsored TLDs (such as .info and .biz) are also subject to price caps. While the appropriateness of these price caps may be debatable, the existence of the caps limits the prices that new gTLDs can charge by capping the price that the major registry operators can charge.

74. While the major TLDs are subject to price caps, a number of the new sponsored TLDs, such as *.museum*, *.travel*, and *.tel*, are not. I am unaware of any complaints from registrars or end-users that obtain services from these new sponsored TLDs that their registries have acted opportunistically by raising prices significantly to existing customers. This provides further evidence that price caps are not necessary to protect registrants from opportunistic behavior by new gTLD registries.

75. Finally, the continuing growth of Internet services further reduces concerns about opportunistic behavior by operators of the new gTLD registries. As noted above, incentives for opportunistic behavior are lower in rapidly growing industries. The number of registered domain names as well as aggregate Internet usage has grown dramatically in recent years and is expected to continue its rapid growth. In addition, the

number of Internet users in the U.S. has grown from roughly 31 million in 1997, to 90 million in 2000 and to more than 183 million in 2007.⁶⁰ The Internet is projected to continue this growth in the future. For example, total IP traffic is projected to increase six-fold from 2007 to 2012.⁶¹ Under these circumstances, operators of new gTLD registries that acted opportunistically would face the loss of significant future business.

VI. CONCLUSION

76. The benefits of free entry are well-recognized, and the introduction of new gTLDs is likely to benefit consumers by subjecting *.com* and other gTLDs to increased competition, widening choice available to consumers, and facilitating innovation. At the same time, claims that the introduction of new gTLDs will necessitate widespread defensive registrations appear to be exaggerated and are inconsistent with the oft-noted observation that there have been a limited number of registrations on gTLDs introduced in recent years. Existing legal framework and ICANN-established procedures provide mechanisms for protecting trademarks and addressing concerns about consumer confusion. If necessary, various additional mechanisms could be created by ICANN to protect against abuse of existing trademarks. The draconian remedy of precluding entry as means of preventing the possibility of a need for defensive registrations is unlikely to be an efficient mechanism for dealing with these costs because it deprives consumers of the benefits of entry.

77. In addition, there is no economic rationale for imposing price caps on registries of these new gTLDs. The existing and proposed ICANN procedures that are

60. Statistical Abstract of the United States 2007: Internet Usage and Online Services (<http://www.census.gov>)

61. See “Cisco Visual Networking Index – Forecast and Methodology, 2007-12” available at http://newsroom.cisco.com/dlls/2008/prod_061608b.html

designed to protect the rights of trademark holders reduce the need both for defensive registrations as well as price caps to protect trademark holders. Apart from concerns about protecting trademark holders, there are a variety of market mechanisms that protect consumers who face switching costs, such as holders of domain names of new gTLD registries. In the absence of price caps, operators of new gTLD registries that attempt to act opportunistically by raising prices to registrars after registrants sign up for domain names face significant risk of harming their reputation and the loss of future customers. These risks are heightened by the availability of domain names from a wide variety of alternative registries, by the fact that prices charged by the major registries are already subject to price caps, and by the expected continued growth of the Internet. At the same time, requiring new gTLDs to cap their prices limits their flexibility in attempting to attract new customers, conflicting with ICANN's well-considered goal of fostering competition in the provision of registry services by facilitating the introduction of new gTLDs.

78. In sum, given ICANN's ability and incentive to modify existing procedures and adopt new ones that protect registrants' the property rights, it would be a mistake at this time to address this concern through the draconian remedy of a ban on all new TLDs.

FIELDS OF SPECIALIZATION

Theoretical and Applied Microeconomics
Industrial Organization

ACADEMIC HONORS AND FELLOWSHIPS

Keynote Speaker, Japanese Symposium on Competition, sponsored by Japan Fair Trade Commission, 2009
Recipient of Inaugural Robert F. Lanzilotti Prize, awarded by the International Industrial Organization Society for Best Paper in Antitrust Economics, 2008
Keynote Address to Israel Antitrust Conference, 2008
Lewis Bernstein Memorial Antitrust Lecture, Washington, D.C., 2006
Distinguished Visitor, University of Melbourne, April 2005
Milton Handler Lecture, New York, 2004
Keynote Address to the International Competition Network, Mexico, 2004
Alexander Brody Distinguished Lecture, Yeshiva University, 2000
Ph.D. Thesis chosen to appear in the Garland Series of Outstanding Dissertations in Economics
Recipient of the 1977 P.W.S. Andrews Memorial Prize Essay, best essay in the field of Industrial Organization by a scholar under the age of thirty
National Science Foundation Grant, 1977 - 1985
Recipient of Post-doctoral Grant from the Lincoln Foundation, 1975
National Science Foundation Fellowship, 1972 - 1975
Phi Beta Kappa, 1971
John Harvard Award, 1970
Detur Book Prize, 1969
Edwards Whitacker Award, 1969
M.I.T., National Scholar Award, 1968

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Co-editor, Journal of Law and Economics, 1980 - present
Visiting Committee, MIT, Department of Economics, 1995 - present
Member, Advisory Board, Economics Research Network, 1996 - present
Member, Advisory Board of Antitrust and Regulation Abstracts, Social Science Research Network, 1998 - present
Advisory Board, Massachusetts Institute of Technology, Department of Economics, 1999 - present
Co-Editor, Competition Policy International (CPI), 2004 – present
Advisory Board, Journal of Competition Law and Economics 2004- present
Deputy Assistant Attorney General for Economic Analysis, Antitrust Division, U.S. Department of Justice, 2006 - 2008
Presidential Appointment to the Antitrust Modernization Commission, March 17, 2004 - 2007
Invited Panelist at Public Hearing on the Retail Banking Sector Inquiry: Payment Cards, before the European Commission in Brussels, Belgium, July 17, 2006.
Consultant on Merger Guidelines to the FTC, 2003
Professor, George Mason Institute for Judges, October 2001
Chairman, FTC Round Table on Empirical Industrial Organization (September 11, 2001)
Participant in the Round Table on the Economics of Mergers Between Large ILECS before the Federal Communications Commission, February 5, 1999

Member, Steering Committee, Social Science Research Council, Program in Applied Economics, 1997 - 1999
Participant in roundtable discussions on "The Role of Classical Market Power in Joint Venture Analysis," before the Federal Trade Commission, November 19, 1997 and March 17, 1998.
Participant in meetings with Committee of the Federal Reserve on Payment Systems, June 5, 1997
Associate Editor, *Regional Science and Urban Economics*, 1987 - 1997
Resident Scholar, Board of Governors of the Federal Reserve System, Summer, 1995
Accreditation Committee, Graduate School of Business, Stanford University, 1995
Associate Editor, *The International Journal of Industrial Organization*, 1991 - 1995
Editorial Board, *Intellectual Property Fraud Reporter*, 1990 - 1995
Consultant on Merger Guidelines to the U.S. Department of Justice, 1991 - 1992
Member, Advisory Committee to the Bureau of the Census, 1987 - 1990
National Bureau of Economic Research, Research Associate
Member, American Economics Association, Econometrics Society

BOOKS

Market Behavior Under Uncertainty, Ph.D. Thesis, Massachusetts Institute of Technology (September 1975); Garland Publishing (1984).

Modern Industrial Organization, Scott, Foresman & Co., co-authored with Jeffrey Perloff, first edition (1990), (Chapter 17 of first edition reprinted as "The Economics of Information" for the University of Connecticut, Food Marketing Policy Center (1989)), second edition (1994), translated into Chinese, French, Hungarian and Italian; Addison Wesley Longman, third edition (2000), fourth edition (2005), translated into Chinese (2009).

RESEARCH PAPERS

"The Equilibrium Analysis of Alternative Housing Allowance Payments," (with Joseph Ferreira) Chapter 6 of Analysis of a Direct Housing Allowance Program, The Joint Center for Urban Studies of M.I.T. and Harvard University, (July 1975).

"Theories of Vertical Integration," presented at Fourth Annual Telecommunications Conference. Appears in a volume of Proceedings of the Fourth Annual Telecommunications Conference, Office of Telecommunications Policy, (April 1976).

"Uncertainty, Production Lags, and Pricing," American Economic Review, (February 1977).

"Selecting Subsidy Strategies for Housing Allowance Programs," (with Joseph Ferreira) Journal of Urban Economics, (July 1977).

"Peak Load Pricing With Stochastic Demand," American Economic Review, (December 1977). (Reprinted in Economic Regulation edited by P.L. Joskow, Edward Elgar Publishing Limited, 1998 and Reprinted in The Economics of Public Utilities edited by Ray Rees, Professor of Economics at the University of Munich, Germany, 2005.)

"The Distribution of Permanent Income," Income Distribution and Economic Inequality, edited by Zvi Griliches, et al. (Halsted Press, 1978).

- "Vertical Integration--An Overview," in Congressional Record Hearings on the Communications Act of 1978. Bill H.R. 13105, (August 3, 1978).
- "Market Behavior with Demand Uncertainty and Price Inflexibility," American Economic Review, (September 1978).
- "Vertical Integration in Competitive Markets Under Uncertainty," Journal of Industrial Economics, (March 1979). Awarded the P.W.S. Memorial Prize for the best essay in the field of Industrial Organization by a scholar under the age of thirty.
- "Valuing Market Benefits and Costs in Related Output and Input Markets," American Economic Review, (September 1979).
- "Contracts, Price Rigidity and Market Equilibrium," Journal of Political Economy, (October 1979).
- "Why New Firms Locate Where They Do: An Econometric Model," in Studies in Regional Economics, edited by W. Wheaton, (Urban Institute, 1980).
- "Benefits and Costs of Airline Mergers: A Case Study," (with W. Landes and R. Posner) Bell Journal of Economics, (Spring 1980). (Reprinted in "Air Transport" in Classics In Transport Analysis series, edited by Kenneth Button and Peter Nijkamp, 2001.)
- "The Limitations of Pigouvian Taxes as a Long Run Remedy for Externalities," (with G. Loury) Quarterly Journal of Economics, (November 1980).
- "The Law and Economics of Rights in Valuable Information: A Comment," Journal of Legal Studies, (December 1980).
- "Price Discrimination: Vertical Integration and Divestiture in Natural Resources Markets," (with J. Perloff) Resources and Energy, (March 1981).
- "The Spatial Effects of a Tax on Housing and Land," Regional Science and Urban Economics, (November 1981).
- "Comments on Weicher," Journal of Law and Economics, (December 1981).
- Comment, in Sherwin Rosen ed. Studies in Labor Markets, University of Chicago Press, (1981).
- "Planning and Market Structure," in The Economics of Information and Uncertainty, edited by J.J. McCall, University of Chicago Press, (1982).
- "The Disruptive Effect of Inflation on the Organization of Markets," in Robert Hall, ed. The Economics of Inflation, University of Chicago Press, (1982).
- "The Need for Coordination Among Firms With Special Reference to Network Industries," (with J. M. Klammer) University of Chicago Law Review, (Spring 1983).
- "A Reexamination of Delivered Pricing," Journal of Law and Economics, (April 1983).
- "Futures Trading, Market Interrelationships, and Industry Structure," American Journal of Agricultural Economics, (May 1983).

- "The Regulation of Insider Trading," (with D. Fischel), Stanford Law Review, (May 1983), reprinted in J. Macey ed., Classics in Corporate Law and Economics, Edward Elgar Publishing (2008).
- "The Location and Employment Choices of New Firms: An Econometric Model with Discrete and Continuous Endogenous Variables," The Review of Economics and Statistics, (August 1983).
- "Economic Goals and Remedies of the AT&T Modified Final Judgment," (with W. Lavey), Georgetown Law Review, (August 1983).
- "Equilibrium Fluctuations When Price and Delivery Lags Clear the Market," Bell Journal of Economics, (Autumn 1983).
- "Energy and Location," Energy Costs, Urban Development, and Housing, Brookings Institution, (1984).
- "Futures Markets: Their Purpose, Their History, Their Growth, Their Successes and Failures," Journal of Futures Markets, (September 1984). (Reprinted in Futures Markets edited by A.G. Malliaris and W.F. Mullady, Edward Elgar Publishing Limited, 1995; and in Classic Futures: Lessons from the Past for the Electronics Age, edited by Lester Telser, Risk Books, 2000.)
- "The Economics of Gray-Market Imports," (with C. DeMuth), written for the Coalition to Preserve the Integrity of American Trademarks (COPIAT), (May 1985).
- "The Limitation of Pigouvian Taxes As A Long Run Remedy for Externalities: Extension of Results," (with G. Loury) Quarterly Journal of Economics, (August 1986).
- "The Rigidity of Prices," American Economic Review, (September 1986).
- "The Theory and The Facts of How Markets Clear: Is Industrial Organization Valuable for Understanding Macroeconomics?" in Handbook of Industrial Organization, eds. Schmalensee and Willig, (1989).
- "Market Power and Mergers in Durable Good Industries," (with R. Gertner), Journal of Law and Economics, (October 1989).
- "Comments on Vertical Integration and Market Foreclosure," Brookings Papers on Economic Activity: Microeconomics, (1990).
- Book Review of Tirole's "The Theory of Industrial Organization", Journal of Political Economy, (June 1990).
- "The Genesis of Inflation and the Costs of Disinflation: Comment," Journal of Money, Credit & Banking, (August 1991, Part 2).
- "The Theory of Allocation and its Implications for Marketing and Industrial Structure: Why Rationing is Efficient," Journal of Law and Economics, (October 1991).
- "The Economics of Cooperation and Competition in Electronic Services Network Industries," in Economics of Electronic Service Networks, Wildman Steven ed., Praeger Press, (1992).
- "Merger Policy and Market Definition Under the EC Merger Regulation," (with W. D. Bishop). Conference on Antitrust in a Global Economy, Fordham Corporate Law Institute, (1994).

- "The Antitrust Economics of Credit Card Networks," (with A. Frankel) Antitrust Law Journal, (Winter 1995).
- "Economic Organization and Conflict," Journal of Institutional and Theoretical Economics, (March 1995).
- "Antitrust and Higher Education: Was There a Conspiracy to Restrict Financial Aid?" (with G. Bamberger and R. Epstein) The Rand Journal of Economics, (Vol. 26, No. 1, Spring 1995, pp. 131-147).
- "The Competitive Effects of Line-of-business Restrictions in Telecommunications," (with K. Arrow and H. Sider), Managerial and Decision Economics, (Vol. 16, pp. 301-321, 1995). (Reprinted in Deregulating Telecommunications - The Baby Bells Case for Competition, edited by Richard S. Higgins and Paul H. Rubin, John Wiley & Sons Ltd., 1995.)
- "The Antitrust Economics of Credit Card Networks: Reply to Evans and Schmalensee," (with A. Frankel), Antitrust Law Journal, (Spring 1995).
- "Antitrust and Payment Technologies," (with A. Frankel), Review, Federal Reserve Bank of St. Louis (November/December 1995).
- "Antitrust Policy Toward Mergers When Firms Innovate: Should Antitrust Recognize the Doctrine of Innovation Markets?" Testimony before the Federal Trade Commission Hearings on Global and Innovation-based Competition (October, 1995).
- "You Keep on Knocking But You Can't Come In: Evaluating Restrictions on Access to Input Joint Ventures," (with S. Salop), Harvard Journal of Law & Technology, (Volume 9, Summer, 1996). (Reprinted in e-Commerce Antitrust & Trade Practices, Practising Law Institute, 2001.)
- "Comments on Causes and Consequences of Airline Fare Wars," Brookings Papers on Economic Activity: Microeconomics, (1996).
- "A Critical Assessment of the Role of Imperfect Competition in Macroeconomics," in Market Behavior and Macro Economic Modeling, Brakman, Van Ees, & Kuipers (eds.), MacMillan Press (1997).
- "Price Rigidity," Business Cycles and Depressions, David Glasner ed., Garland Publishing, Inc., (1997).
- "Communication Among Competitors: Game Theory and Antitrust," (with R. Gertner and A. Rosenfield), George Mason Law Review, (1997). (Reprinted in e-Commerce Antitrust & Trade Practices, Practising Law Institute, 2001.)
- "Comments on Born and Viscusi," Brookings Papers on Economic Activity: Microeconomics, (1998).
- "Antitrust and Higher Education: MIT Financial Aid (1993)," (with G. Bamberger), The Antitrust Revolution, in eds. J. Kwoka and L. White, (Oxford University Press, 3rd edition 1999).
- "Market Power and Vertical Restraints in Retailing: An Analysis of FTC v. Toys 'R' Us," (with H. Sider), The Role of the Academic Economist in Litigation Support, edited by Daniel Slottje, North Holland, (1999).

- "The Economics of Religion, Jewish Survival and Jewish Attitudes Toward Competition on Torah Education," (with A. Weiss), Journal of Legal Studies, (2001). (Reprinted in Essential Readings on Jewish Identities, Lifestyles and Beliefs, edited by Stanford M. Lyman, Gordian Knot Books, 2003).
- "A General Analysis of Exclusionary Conduct and Refusal to Deal -- Why Aspen and Kodak are Misguided," Antitrust Law Journal, (2001). (Reprinted in e-Commerce Antitrust & Trade Practices, Practising Law Institute, 2001.)
- "The Lessons from Microsoft," Business Economics, (January 2001).
- "Lessons from Halacha About Competition and Teaching," (with A. Weiss), Center for Business Ethics Social Responsibility, <http://besr.org/library/competition.html>, (March 2001).
- "The Choice of Organizational Form in Gasoline Retailing and The Costs of Laws Limiting that Choice," (with A. Blass), Journal of Law and Economics, (October 2001). Reprinted in Franchise Contracting and Organization, edited by Francine Lafontaine, Elgar Publishing, (2005).
- "Should The Merger Guidelines Be Scrapped? Introduction to a Debate," in Symposium On The Antitrust Analysis Of Mergers: Merger Guidelines vs. Five Forces, 33 U. WEST L.A. L. REV. (2001).
- "Free Riding and Sales Strategies for the Internet," (with J. Chevalier), The Journal of Industrial Economics, (December 2001).
- "The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries," (with M. Waldman), The Rand Journal (Vol. 33, No. 2, Summer 2002). (Reprinted in B. Klein and A. Lerner eds. Economics of Antitrust Law, Edward Elgar Publishing Ltd, 2008, and Recent Developments in Monopoly and Competition Policy, The International Library of Critical Writings in Economics, edited by George Norman, Edward Elgar Publishing Ltd, 2008.)
- "The Competitive Effects of Fannie Mae," (with D. Gross and R. Stillman) in Housing Matters: Issues in American Housing Policy, Fannie Mae (January 2002, reprinted 2004).
- "Intellectual Property, Antitrust and Strategic Behavior," (with R. Gertner), in eds. Adam Jaffee and Joshua Lerner, Innovation Policy and the Economy, Volume 3, MIT Press (2003).
- "Airline Networks and Fares," (with G. Bamberger), Handbook of Airline Economics, 2nd ed., Darryl Jenkins, ed., McGraw Hill (2003).
- "Contracts that Lessen Competition -- What is Section 27 for, and How Has it Been Used?" (with David Goddard), in Mark N. Berry and Lewis T. Evans eds., Competition Law at the Turn of the Century: A New Zealand Perspective, Victoria University Press (2003).
- Interview, Economists' Roundtable, Antitrust Magazine, (Spring 2003).
- "The Relevance for Antitrust Policy of Theoretical and Empirical Advances in Industrial Organization," (Fall 2003), George Mason Law Review.
- "The Control of Externalities in Sports Leagues: An Analysis of Restrictions in the National Hockey League," (with A. Frankel and E. Landes), Journal of Political Economy, (February 2004).

"An Empirical Investigation of the Competitive Effects of Domestic Airline Alliances," (with G. Bamberger and L. Neumann), Journal of Law and Economics, Vol. 47, No. 1, (April 2004, pp. 195-222).

"Why Barriers to Entry are Barriers to Understanding," American Economic Review, (May 2004).

"Using Economics to Improve Antitrust Policy," Milton Handler Lecture, Columbia Business Law Review, (June 2004).

"The Proper Role for Antitrust in an International Setting," (Keynote address: Second Annual Conference of the International Competition Network (ICN), Merida City, Mexico (June 25, 2003), appears as Appendix to "Using Economics to Improve Antitrust Policy", Columbia Business Law Review (June 2004).

"Econometric Analysis of Telephone Mergers," (with H. Sider) pp. 373-395 in American Bar Association, Econometrics: Legal, Practical, and Technical Issues, (2005).

"How Economics Can Improve Antitrust Doctrine Towards Tie-in Sales," (with M. Waldman), Competition Policy International, (Spring 2005).

Preface to: "Law and Economics of the Mexican Competition Laws," by Francisco Gonzalez de Cossio (2005).

"Transaction Costs, Externalities and "Two-Sided" Payment Markets," (with A. Frankel), Columbia Business Law Review, No. 3, Vol. (2005).

"Predation and the Entry and Exit of Low-Fare Carriers," (with G. Bamberger), in Advances in Airline Economics: Competition Policy and Antitrust, Darin Lee, ed., (2006).

"Why Tie An Essential Good," (with Michael Waldman), in Hahn R. ed., Antitrust Policy and Vertical Restraints, AEI-Brookings, (July 2006).

"Market Definition: Use and Abuse," Competition Policy International (Spring 2007)

Interview with Deputy Assistant Attorney General, The Antitrust Source (February 2007)

Separate Statement of Dennis W. Carlton, in The Report of the Antitrust Modernization Commission, (April 2007)

"Does Antitrust Need to be Modernized?," Journal of Economic Perspectives (Summer 2007)

"The Year in Review: Economics at the Antitrust Division 2006-2007" (with K. Heyer), Review of Industrial Organization, (2007).

"Economic Analysis of Competition Practices in the EU and the U.S.: A View from Chief Economists," (with M. Salinger), Competition Policy International (Autumn 2007).

"Mergers," Palgrave Dictionary, (with J. M. Perloff), (2008).

"Antitrust and Regulation," (with R. Picker) in N. Rose ed., Economics of Deregulation, NBER, (forthcoming).

- "Tying," (with M. Waldman), in W. Collins ed. Issues in Competition Law and Policy, American Bar Association, (2008).
- "Barriers to Entry," in W. Collins ed. Issues in Competition Law and Policy, American Bar Association, (2008).
- "Product Variety and Demand Uncertainty: Why Mark-ups Vary with Quality," (with James D. Dana Jr.), Journal of Industrial Economics (2008)
- "Regulation, Antitrust, and Trinko," (With H. Sider), in eds. J. Kwoka and L. White, The Antitrust Revolution, (2008).
- "Proposal for a Market-Based Solution to Airport Delays," (with W. Whalen, K. Heyer and O. Richard), Regulation (2008).
- "Should 'Price Squeeze' Be A Recognized Form of Anticompetitive Conduct?," Journal of Competition Law and Economics (2008).
- "Safe Harbors for Quantity Discounts and Bundling," (with M. Waldman), George Mason Law Review (2008).
- "The Need to Measure the Effect of Merger Policy and How to Do It," Antitrust, (condensed version of subsequent paper), (Summer 2008).
- "Why We Need to Measure the Effect of Merger Policy and How to Do It," Competition Policy International (Spring 2009).
- "Appropriate Antitrust Policy Towards Single-Firm Conduct: Extraction vs. Extension" (with K. Heyer)," Antitrust, (condensed version of subsequent paper), (Summer 2008).
- "Extraction vs. Extension: the Basis for Formulating Antitrust Policy Towards Single-Firm Conduct" (with K. Heyer), Competition Policy International, (Autumn, 2008).
- "Assessing the Anticompetitive Effects of Multiproduct Pricing," (with P. Greenlee and M. Waldman), Antitrust Bulletin, (Fall, 2008).
- "Competition, Monopoly, and Aftermarkets," (with M. Waldman), Journal of Law, Economics and Organization, (April 2009).
- "Competition Policy: Beware of Using It to Harm Competition," Fair Trade, Japan, (April 2009).
- "How to Measure The Effectiveness of US Merger Policy," <http://voxeu.org/index.php?q=node/3344>, (2009).

UNPUBLISHED PAPERS

- "Modeling the Housing Allowance Program," M.A. Thesis, Massachusetts Institute of Technology (September 1974).

"The Cost of Eliminating a Futures Market and The Effect of Inflation on Market Interrelationships," (1984).

"The Empirical Importance of Delivery Lags as an Explanation of Demand," (1984).

"Statistical Supplement to The Antitrust Economics of Credit Card Networks: Reply to Evans and Schmalensee Comment, 63 Antitrust Law Journal 903 (1995)," (with Alan Frankel), (May 1997).

"Tying, Upgrades, And Switching Costs In Durable-Goods Markets," (with Michael Waldman), NBER Working Paper 11407, (2005).

"Antitrust and Not for Profits," (with G. David), mimeo (2005).

"Why Tie a Product Consumers Do Not Use?," (with J. Gans and M. Waldman), NBER Working Paper 13339, Recipient of Inaugural Robert F. Lanzilotti Prize, awarded by the International Industrial Organization Society for Best Paper in Antitrust Economics, (2008).

"Mergers in Regulated Industries: Electricity," Department of Justice, Antitrust Division, Economic Group Paper, 07-16, (2007).

EXPERT TESTIMONIAL EXPERIENCE

Testimony of Dennis W. Carlton in Re: "Vertical Integration--An Overview, "Congressional Record Hearings on the Communications Act of 1978: Proceedings before the House on Bill H.R. 13105, August 3, 1978.

Testimony of Dennis W. Carlton in Re: Competitive Effects of the Proposed North Central-Southern Airline Merger: Proceedings before the Civil Aeronautics Board, Docket No. 33136, Exhibit NC/SO-T-7, October 13, 1978 and October 9, 1979 (with William M. Landes and Richard A. Posner).

Testimony of Dennis W. Carlton in Re: McNeilab, Inc.: Proceedings before the United States Department of Justice, Drug Enforcement Administration, Docket No. 78-13, March 13, 1980 and May 1980 (Oral).

Testimony of Dennis W. Carlton in Re: Acco Industries, Inc. v. Kresl Power Equipment, Inc.: In the U.S. Court of Appeals For the Seventh Circuit, Docket No. 80-2024, March 29, 1980.

Deposition, Testimony, and Rebuttal Testimony of Dennis W. Carlton in Re: Ethyl Corporation: Proceedings before the Federal Trade Commission, Docket No. 9128, November 10 & 11, 1980 (Deposition), November 13 & 14, 1980 (Testimony), February 20, 1981 (Rebuttal).

Deposition of Dennis W. Carlton in Re: Independence Tube Corporation v. Copperweld Corporation, Regal Tube Company, The Yoder Company v. David F. Grohne (counter-defendant): In the U.S. District Court for the Northern District of Illinois, Eastern Division, No. 76 C 4201, January 24, 1981.

Affidavit of Dennis W. Carlton in Re: Ellis Banking Corporation, Ellis First National Bank of Bradenton, and Ellis First Security Bank v. Barnett Banks of Florida, Inc., Barnett Bank of Manatee County,

and Westside National Bank of Manatee County: In the U.S. District Court for the Middle District of Florida, Tampa Division, No. 81-693-Civ-T-H, July 28, 1981.

Deposition and Economic Report of Dennis W. Carlton in Re: Schneider Industrial Sales and Service Company, William Schneider and Mary Emily Schneider v. Acco Industries, Inc.: In the U.S. District Court for the District of New Jersey, April 19, 1982.

Deposition and Testimony of Dennis W. Carlton in Re: City of Batavia, et al. v. Commonwealth Edison Company: Proceedings before the U.S. District Court, Northern District of Illinois, Eastern Division, No. 76 C 4388, May 17, 18 & 25, 1982 (Deposition), July 22, 1982 (Testimony).

Deposition of Dennis W. Carlton in Re: M. K. Metals Inc., et al. v. National Steel Corporation: In the U.S. District Court for the Northern District of Illinois, Eastern Division, No. 79 C 1661, September 15, 1983.

Declaration and Deposition of Dennis W. Carlton in Re: Carter Hawley Hale Stores, Inc. v. The Limited, Inc., et al.: In the U.S. District Court, Central District California, No. CV 84 22000 AWT (JRX), April 21, 1984 (Declaration), April 23, 1984 (Deposition).

Verified Statements and Testimony of Dennis W. Carlton in Re: Denver & Rio Grande Western Railroad v. Santa Fe Southern Pacific Corporation et al: Proceedings before the Interstate Commerce Commission, Docket No. 30400, August 28, 1984, November 14, 1984, and May 22, 1985, (Statements), and January 30, 1985 and June 19, 1985, (Testimony).

Affidavit of Dennis W. Carlton in Re: United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company: In the United States District Court for the District of Columbia, December 19, 1984 (with William M. Landes).

Statement of Carlton in Re: To the National Telecommunications Information Administration (NTIA) Request for Comments in Connection with the Comprehensive Study of the Structure and Regulation of the U.S. Telecommunications Industry, March 29, 1985 (with DeMuth, Landes, and Rosenfield).

Deposition and Affidavit of Dennis W. Carlton in Re: L&W Industries, Inc. v. American Standard, Inc.: In the U.S. District Court, Eastern District of Wisconsin, Civil Action No. 81-C-1409, May 14, 1985 (Deposition), August 30, 1985 (Affidavit).

Testimony of Dennis W. Carlton in Re: E. I. Du Pont De Nemours and Company's Thebaine Import Application: Proceedings before the U.S. Department of Justice, Drug Enforcement Administration, Docket No. 84-51, May 31, 1985.

Testimony of Dennis W. Carlton in Re: Joint Application of Pan American World Airways, Inc. and United Airlines, Inc., Pacific Division Transfer Case: Proceedings before the U.S. Department of Transportation, Docket No. 43065, August 7, 1985 (with William M. Landes and Sam Peltzman).

Deposition of Dennis W. Carlton in Re: General Motors "THM 200" Transmission Litigation: Proceedings before the U.S. District Court, Northern District of Illinois, Eastern Division, No. 79 C 1249, 80 C 2151 and 85 C 4805, July 2, 1986.

Affidavit of Dennis W. Carlton in Re: Norwest Bank Fire Case: Proceedings before the U.S. District Court, Fourth Judicial District, State of Minnesota, Court File No. 83-08122, August 28, 1986.

Affidavit of Dennis W. Carlton in Re: Policy and Rules Concerning Rates for Dominant Carriers: Before the Federal Communications Commission, Washington, D.C., Docket No. 87-313, October 16, 1987.

Deposition of Dennis W. Carlton in Re: Research Institute for Medicine and Chemistry, Inc. v. Wisconsin Alumni Research Foundation: In the U.S. District Court, Western District of Wisconsin, Case No. 85-C-1060-D, October 20 & 21, 1986.

Affidavit and Deposition of Dennis W. Carlton in Re: United States Football League, et al. v. National Football League, et al.: In the U.S. District Court, Southern District of New York, 84 Civ. 7484 (PKL), November 24, 1986 (Affidavit), February 26, 1986 and December 4, 1986 (Deposition).

Verified Statements of Dennis W. Carlton in Re: Coal Trading Corporation, et al. v. The Baltimore and Ohio Railroad Co., et al.: Before the Interstate Commerce Commission, ICC Docket No. 38301S, December 16, 1986 and September 8, 1987.

Testimony of Dennis W. Carlton in Re: The Application of Pacific Bell, a Corporation, for Authority to Increase Certain Intrastate Rates and Charges Applicable to Telephone Services Furnished within the State of California, California Public Utilities Commission, Application No. 85-01-034, December 19, 1986 and January 22 & 28, 1987.

Deposition of Dennis W. Carlton in Re: John H. Torphy v. Touche Ross & Co., et al.: In the Circuit Court Dane County, State of Wisconsin, Case No. 82-CV-4033, August 25, 1987.

Deposition of Dennis W. Carlton in Re: Martin Exploration Management Company, et al. v. Panhandle Eastern Corporation, et al.: In the U.S. District Court for the District of Colorado, Civil Action No. 86-Z-804, May 5, 6 & 18, 1988.

Deposition of Dennis W. Carlton in Re: The Dow Chemical Company v. Halliburton Company and The Dow Chemical Company v. Mississippi Power & Light Company: In the U.S. District Court for the Northern District of Mississippi Greenville Division, No. GC-78-31-GD-D and No. GC-78-32-GD-D, June 16, 1988.

Statements and Testimony of Dennis W. Carlton in Re: Trailer Train Company et al., Approval of Pooling of Car Service With Respect to Flat Cars: Before the Interstate Commerce Commission, Finance Docket No. 27590. (Sub-No. 1), July 7 & 14, 1988 (Statements), July 25 & 26, 1988 (Testimony).

Testimony of Dennis W. Carlton in Re: Pontarelli Limousine, Inc. v. City of Chicago, Finance Docket No. 83-C-6716, September 25 & 26, 1989.

Deposition of Dennis W. Carlton in Re: Great Northern Nekoosa Corporation v. Georgia-Pacific Corporation: Before the United States District Court District of Connecticut, Civ. Action No. B-89-607-WWE, December 28, 1989 and January 15, 1990.

Testimony of Dennis W. Carlton in Re: The Matter of the Physicians and Surgeons Medical Malpractice Insurance Rates of St. Paul Fire & Marine Insurance Company: Before the State of Minnesota Office of Administrative Hearings for the Commissioner of Commerce, O.A.H. Docket No. 0-1004-3412-2, January 1990.

- Deposition of Dennis W. Carlton in Re: Dale A. Ervin, et al. v. Amoco Oil Company, et al.: In the District Court, City and County of Denver, State of Colorado, No. 88-CV-11994, September 5, 1990.
- Reply Affidavit of Dennis W. Carlton in Re: United States of American v. Western Electric Company Inc. and American Telephone and Telegraph Company: In the United States District Court for the District of Columbia, Civil Action No. 82-0192, January 10, 1991 (with George J. Stigler).
- Testimony of Dennis W. Carlton in Re: Westreco, Inc. v. Commissioner of Internal Revenue: In the United States Tax Court, Washington, D.C. 20217, Docket No. 24078-88, January 29, 1991.
- Deposition, Testimony, and Rebuttal Testimony of Dennis W. Carlton in Re: In the Matter of Marathon Oil Company and Phillips Petroleum Company: Before the Department of Revenue, State of Alaska, Case No. 89314, April 23 & 24, 1991 (Deposition), March 28, 1991 (Expert Report), June 19, 1991 (Testimony), July 22, 1991 (Rebuttal Testimony), October 3 & 4, 1991 (Oral).
- Deposition of Dennis W. Carlton in Re: Martin Exploration Management Company, et al. v. Panhandle Eastern Pipeline Corporation, et al.: In the U.S. District Court for the District of Colorado, Civil Action No. 91-N-110, February 5, 1992.
- Deposition, Affidavit and Testimony of Dennis W. Carlton in Re: United States of America v. Brown University, et al.: In the U.S. District Court For the Eastern District of Pennsylvania, Civil Action No. 91-CV-3274, February 18 & 19, 1992 (Deposition), April 28, 1992 (Affidavit), July 8 & 9, 1992 (Testimony).
- Deposition of Dennis W. Carlton in Re: United States of America, People of The State of California, et al. v. J. B. Stringfellow, Jr., et al.: In the United States District Court Central District of California, No. CIV 83-2501 JMI, March 10 & 11, 1992.
- Affidavit of Dennis W. Carlton in Re: SCFC ILC, Inc. d/b/a MountainWest Financial v. Visa U.S.A., Inc.: In the U.S. District Court for the District of Utah, Central Division, Civil No. 2:91-cv-047B, June 25, 1992.
- Deposition and Testimony of Dennis W. Carlton in Re: Adcom, Incorporated, Cutrone Communications, Incorporated, Great Southern Communications Incorporated, Nola Communications Incorporated and Conrad Communications, Incorporated v. Nokia Corporation, Nokia-Mobira Oy, Nokia-Mobira, Incorporated, Nokia, Incorporated, Nokia Data Communications and Cue Paging Corporation: In the United States District Court for the Eastern District of Louisiana, Civil Action Number 90-4088, November 3 & 4, 1992 (Deposition), February 9 & 10, 1993 (Testimony).
- Statement, Supplemental Statement and Deposition of Dennis W. Carlton in Re: City of Dillingham, et al. v. Western Pioneer, Inc., et al., and City of Nome v. Western Pioneer, Inc., et al.: In the United States District Court for the District of Alaska, No. A89-014 Civil (Consolidated for Pre-Trial Proceedings with No. N89-004 Civil), November 6, 1992 (Statement and Supplemental Statement), November 24, 1992 (Deposition).

- Verified Statement of Dennis W. Carlton in Re: Kansas City Southern Industries, Inc., The Kansas City Southern Railway Company and K&M Newco, Inc. -- Control -- MidSouth Corporation, MidSouth Rail Corporation, MidLouisiana Rail Corporation, SouthRail Corporation and TennRail Corporation, Before the Interstate Commerce Commission, Finance Docket No. 32167, May 1993.
- Verified Statements and Deposition of Dennis W. Carlton in Re: Union Pacific Corporation, Union Pacific Railroad Company and Missouri Pacific Railroad Company -- Control -- Chicago and North Western Holdings Corp. and Chicago and Northwestern Transportation Company: Before the Interstate Commerce Commission, Finance Docket No. 32133, May 24, 1993, June 21, 1993, and November 24, 1993 (Statements), March 17, 1994 and July 26, 1994 (Deposition).
- Verified Statement of Dennis W. Carlton in Re: Application of TTX Company and Certain Common Carriers by Railroad For Approval of Amendment of Pooling Agreement and Car Contract Extending Their Terms, Before the Interstate Commerce Commission, Finance Docket No. 27590 (Sub-No. 2), November 19, 1993.
- Deposition of Dennis W. Carlton in Re: Merck & Co., Inc. v. Alcon Laboratories, Inc., In the United States District Court for the District of Delaware, No. C.A. 92-691, December 14, 1993.
- Deposition and Affidavit of Dennis W. Carlton in Re: Northwest Airlines, Inc. v. American Airlines, Inc., Before the United States District Court, District of Minnesota, Fourth Division, C.V. No. 4-91-539, February 22 & 23, 1994, May 16 & 17, 1995, and July 8, 1997 (Deposition); and February 20, 1995 and May 9, 1996 (Affidavit).
- Testimony of Dennis W. Carlton in Re: Florida Power & Light Company: Before the Federal Energy Regulatory Commission, Docket Nos. ER93-465-000, ER93-507-000, ER-93-922-000, and EL94-12-000, April 5, 1994, October 19, 1994, and June 22, 1995.
- Testimony of Dennis W. Carlton in Re: The Matter of Touchfax Information Systems Inc. and Landis & Gyr Communications: Before the American Arbitration Association, No. 13-T-133-00260-93, May 10, 1994.
- Affidavit and Declaration of Dennis W. Carlton in Re: United States of America v. Western Electric Company, Inc., and American Telephone and Telegraph Company: Before the United States District Court for the District of Columbia, Civil Action No. 82-0192, February 28, 1994 (Affidavit with Kenneth J. Arrow), May 30, 1995 (Declaration with Kenneth J. Arrow).
- Affidavit and Testimony of Dennis W. Carlton in Re: Leonard R. Kahn v. Emerson Electric Co., a Missouri corporation; Hazeltine Corporation, a Delaware corporation; and Motorola, Inc., a Delaware corporation; John Doe corporations 1-x; and John Does 1-x, individually; Before the United States District Court, for the Eastern District of New York, 92 Civ. 3063 (ADS), October 20, 1994 (Affidavit with Alan S. Frankel), May 22, 1995 (Testimony with Alan S. Frankel).
- Deposition and Testimony of Dennis W. Carlton in Re: Federal Trade Commission v. B.A.T. Industries P.L.C., Brown and Williamson Tobacco Corporation; American Brands, Inc.; and American Tobacco Company, Before the United States District Court, Southern District of New York, C.V. No. 94 Civ. 7849, November 20, 1994 (Deposition), December 14, 1994 (Testimony).
- Affidavit, Supplemental Affidavit and Deposition of Dennis W. Carlton in Re: Weatherford Roofing Company v. Employers National Insurance Company and Employers Casualty Company et al: In the United States District Court for the District of Dallas County, Texas, 116th Judicial District,

No. 91-05637, May 5, 1995 (Affidavit), May 9-10 & June 1, 1995 (Deposition), October 20, 1995 (Supplemental Affidavit).

Affidavit of Dennis W. Carlton in Re: Airline Travel Agency Commission Antitrust Litigation: In the United States District Court for the District of Minnesota, No. 4-95-107, June 14, 1995.

Declaration of Dennis W. Carlton in Re: Donnelly Corporation v. Gentex Corporation: In the United States District Court for the Western District of Michigan, Southern Division, Case No. 1:93 CV 530, October 20, 1995.

Testimony of Dennis W. Carlton in Re: Hearings on Global and Innovation-based Competition, before the Federal Trade Commission October 25, 1995.

Report and Deposition of Dennis W. Carlton in Re: Brand Name Prescription Drugs Antitrust Litigation, In the United States District Court for the Northern District of Illinois, Eastern Division, MDL No. 997, November 20, 1995 (Report), December 18 & 19, 1995 (Deposition).

Expert Report and Deposition of Dennis W. Carlton in Re: Johnson Matthey v. General Motors (Antitrust Counterclaim), District Court for the Eastern District of Wisconsin, No. 93 C 0931, January 9, 1996 (Expert Report), February 14, 1996 (Deposition).

Brief of Evidence, Summary of Evidence, and Testimony of Dennis W. Carlton on Behalf of Defendants in Re: Shell (Petroleum Mining) Company Limited and Todd Petroleum Mining Company Limited v. Kapuni Gas Contracts Limited and Natural Gas Corporation of New Zealand Limited, In the High Court of New Zealand, Auckland Registry, Commercial List, CL 5/94, April 2, 1996 (Brief of Evidence), July 18, 1996 (Summary of Evidence), July 18-19, 1996 (Testimony).

Expert Report, Deposition, and Testimony of Dennis W. Carlton in Re: The Matter of the Arbitration Between Sprint Communications Company L.P. and Network 2000 Communications Corporation, Arbitration Case Number 57 181 0013 94, July 15, 1996 (Expert Report with H. Sider), August 12, 1996 (Deposition), September 27, 1996 (Testimony).

Testimony, Prepared Statement and Affidavit of Dennis W. Carlton on behalf of Sacramento Municipal Utility District in Re: Pacific Gas & Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company: Before the Federal Energy Regulatory Commission Technical Conference on Market Power & Transmission Pricing, Docket Nos. ER96-1663-000, EC96-19-000, EL96-48-000, September 12, 1996 (Testimony and Prepared Statement), January 16, 1997 (Affidavit with G. Bamberger).

Declaration of Dennis W. Carlton in Re: United States of America v. International Business Machines: In the United States District Court for the Southern District of New York, Civil Action No. 72-344 (AGS), November 12, 1996.

Expert Report, Affidavit Rebuttal and Deposition of Dennis W. Carlton in Re: Bell Atlantic Corporation and DSC Communications Corporation v. AT&T Corporation and Lucent Technologies Inc., Civil Action No. 5-96CV45, December 4, 1996 (Expert Report with R.E. Olley and D.S. Sibley), January 10, 1997 (Affidavit Rebuttal with R.E. Olley and D.S. Sibley), January 21, 1997 (Deposition).

Affidavit of Dennis W. Carlton in Re: Advanta Corp., Advanta National Bank U.S.A., and Advanta National Bank v. Visa U.S.A., Inc. and Mastercard International, Inc.: In the United States

District Court for the Eastern District of Pennsylvania, Civil Action No. 96-CV-7940, January 21, 1997.

Deposition, Testimony, and Surrebuttal Testimony of Dennis W. Carlton in Re: In the Matter of Toys "R" Us, Inc.: In the United States of America Before the Federal Trade Commission, File No. 9278, March 16, 1997 (Deposition), April 16 and 25, 1997 (Testimony), June 3, 1997 (Surrebuttal Testimony).

Deposition of Dennis W. Carlton in Re: In the Matter of Theresa Aguilar, et al vs. Atlantic Richfield Corporation et al: In the Superior Court of the State of California In and For the County of San Diego, File No. 700810, September 30, 1997 (Deposition).

Report of Dennis W. Carlton in Re: Few Ready Mix Concrete Co., v. Transit Mix Concrete & Materials Co., et al: In the United States District Court for the Eastern District of Texas Lufkin Division, No. 9:96-CV-86, October 31, 1997 (with W. J. Lynk).

Verified Statement, Depositions, Verified Reply Statement, and Verified Rebuttal Statement of Dennis W. Carlton in Re: CF Industries, Inc. v. Koch Pipeline Company, L.P.: In the United States of America Before the Department of Transportation Surface Transportation Board, No. 41685, November 7, 1997 (Verified Statement), December 19, 1997 (Deposition), January 8, 1998 (Verified Reply Statement), February 3, 1998 (Deposition), February 20, 1998 (Verified Rebuttal Statement).

Expert Witness Report, Deposition and Affidavits of Dennis W. Carlton in Re: Industrial Silicon Antitrust Litigation: In the United States District Court for the Western District of Pennsylvania, No. 95-2104, January 9, 1998 (Expert Witness Report), February 10-11, 1998 (Deposition), April 8, 1998 (Affidavit), June 29, 1998 (Affidavit).

Declaration, Affidavit (NY), Affidavit (FL) and Second Declaration of Dennis W. Carlton in Re: Applications of WorldCom, Inc. and MCI Communications Corporation for Transfer of Control of MCI Communications Corporation to WorldCom, Inc.: Before the Federal Communications Commission, CC Docket No. 97-211, January 25, 1998 (with H. Sider); Before the New York State Public Service Commission, No. 97-C-1804, February 16, 1998 (Affidavit with H. Sider); Before the Florida Public Service Commission, No. 971375-TP, February 27, 1998 (Affidavit with H. Sider); Before the Federal Communications Commission, CC Docket No. 97-211, March 19, 1998 (Second Declaration with H. Sider).

Expert Report and Deposition of Dennis W. Carlton in Re: Bepco, Inc., et al v. AlliedSignal Inc. and AlliedSignal Truck Brake System Co.: In the United States District Court for the Middle District of North Carolina, Winston-Salem Division, No. 6:96CV00274, February 3, 1998 (Expert Report), March 3, 1998 (Deposition).

Affidavit, Reports, Reply Affidavit, Reply Report, Prepared Statements and Testimony of Dennis W. Carlton in Re: The Merger of SBC Communications Inc. with Ameritech Corporation: Before the Federal Communications Commission, CC Docket No. 98-141, July 20, 1998 (Affidavit and Report), November 12, 1998 (Reply Affidavit and Reply Report), February 5, 1999 (Prepared Statements and Testimony as a Participant in the Round Table on the Economics of Mergers Between Large ILECS), April 13, 1999 (Report to the FCC on Supplemental Analysis of the Katz/Salop Hypothesis).

Report and Supplemental Report of Dennis W. Carlton in Re: Riverside Pipeline Company v. Panhandle Eastern Pipeline Company: In the U.S. District Court for the Western District of

Missouri, No. 97-0642-CV-W-4, September 20, 1998 (Report with H. Sider), January 7, 1999 (Supplemental Report).

Statement of Dennis W. Carlton in Re: Enforcement Policy Regarding Unfair Exclusionary Conduct in the Air Transportation Industry: Before the Department of Transportation, Office of the Secretary, Washington, D.C., Docket No. OST-98-3713, September 24, 1998 (with G. Bamberger).

Report and Deposition of Dennis W. Carlton in Re: The Procter & Gamble Company, et al. vs. Amway Corporation, et al.: In the U.S. District Court for the Southern District of Texas, Houston Division, January 8, 1999 (Report), February 9, 1999 (Deposition).

Responsive Direct Testimony, Prepared Answering Testimony (OK), Prepared Answering Testimony and Exhibits (FERC) of Dennis W. Carlton for Intervenor Oklahoma Gas and Electric Company in Re: Joint Application of American Electric Power Company, Inc., Public Service Company of Oklahoma and Central and South West Corporation Regarding Proposed Merger: Before the Corporation Commission of the State of Oklahoma, Cause No. PUD 980000444, March 29, 1999 (with G. Bamberger); United States of American Before the Federal Energy Regulatory Commission FERC Docket Nos. ER98-40-000, ER98-2770-000, ER98-2786-000, April 27, 1999 (with G. Bamberger).

Report and Declaration of Dennis W. Carlton in Re: Telnet Communications, Inc., et al. v. WorldCom, Inc., et al.: In the United States District Court for the Southern District of Texas, Houston Division, No. H-98-2020, March 30, 1999 (Report), April 28, 1999 (Declaration).

Expert Report, Deposition and Supplemental Report of Dennis W. Carlton in Re: United States of America vs. American Society of Composers, Authors and Publishers in the Matter of the Application of Turner Broadcasting Systems Inc. for the Determination of Reasonable License Fees: Before the United States District Court, Southern District of New York, Civ. 13-95 (WCC) (Referred to Magistrate Judge Dolinger), April 15, 1999 (Expert Report), July 28-29 and August 5, 1999 (Deposition), December 16, 1999 (Supplemental Report).

Declaration, Deposition and Reply Declaration of Dennis W. Carlton in Re: Visa Check/MasterMoney Antitrust Litigation: Before the United States District Court, Eastern District of New York, No. CV 96-5238 (JB) RLM), April 15, 1999 (Declaration), May 25, 1999 and June 1, 1999 (Deposition), August 1, 1999 (Reply Declaration).

Report and Deposition of Dennis W. Carlton in Re: Zeneca Limited, Zeneca Holdings Inc., and Zeneca Inc. v. Rhone-Poulenc Inc. and Rhone-Poulenc AG Company: In the United States District Court for the District of Delaware, No. 97-652-GMS, May 17, 1999 (Report), June 16, 1999 (Deposition).

Affidavit and Reply Affidavit of Dennis W. Carlton in Re: Andersen Consulting Business Unit Member Firms v. Arthur Andersen Business Unit Member Firms and Andersen Worldwide Societe Cooperative: Before the International Court of Arbitration of the International Chamber of Commerce, No. 9797/CK, June 2, 1999 (Affidavit), September 13, 1999 (Reply Affidavit).

Affidavit, Report, Rebuttal Report, Reply Report, Rebuttal Report and Testimony of Dennis W. Carlton in Re: The Commissioner of Competition and Superior Propane Inc. and ICG Propane Inc.: Before The Competition Tribunal, No. CT-98/2, August 17, 1999 (Affidavit and Report), September 14, 1999 (Rebuttal Report with G. Bamberger), September 19, 1999 (Reply Report with G. Bamberger), September 27, 1999 (Rebuttal Report to Professor Michael Ward with G. Bamberger), December 13-14, 1999 (Testimony with G. Bamberger).

- Declaration of Dennis W. Carlton in Re: Merger of Qwest Communications International Inc. and U S WEST, Inc.: Before the Federal Communications Commission, CC Docket No. 99-272, October 18, 1999 (with Hal Sider).
- Prepared Direct Testimony, Deposition and Cross-Examination of Dr. Dennis W. Carlton on behalf of Sierra Pacific Power Company in Re: United States of America Before the Federal Energy Regulatory Commission: Docket Nos. ER99-28-001, ER99-28-003, EL99-38-002 and ER99-945-002, November 17, 1999 (Prepared Direct Testimony), January 10, 2000 (Deposition), April 26 and May 1, 2000 (Cross-Examination).
- Expert Report and Deposition of Dennis W. Carlton in Re: United States of America v. Northwest Airlines Corporation and Continental Airlines, Inc.: In the United States District Court for the Eastern District of Michigan, Southern Division, Civil Action No. 98-74611, January 27, 2000 (Expert Report), June 7, 2000 (Deposition).
- Declaration and Ex Parte Declaration of Dennis W. Carlton in Re: Joint Applications of MCI WorldCom, Inc., and Sprint Corporation for Consent to Transfer Control: Before the Federal Communications Commission, CC Docket No. 99-333, February 18, 2000 (Declaration with H. Sider), May 10, 2000 (Ex Parte Declaration with H. Sider).
- Testimony, Rebuttal Testimony and Cross-Examination of Dennis W. Carlton on behalf of Sacramento Municipal Utility District in Re: Application of Pacific Gas and Electric Company to Market Value Hydroelectric Generating Plants and Related Assets Pursuant to Public Utilities Code Sections 367(b) and 851: Before the Public Utilities Commission of the State of California, application No. 99-09-053, March 2, 2000 (Testimony), March 16, 2000 (Rebuttal Testimony), May 9, 2000 (Cross-Examination).
- Affidavit, Deposition and Reply Affidavit of Dennis W. Carlton in Re: Gregory F. Daniel, M.D., et al., v. American Board of Emergency Medicine, et al: In the United States District Court for the Western District of New York, Civil Action No. 90-CV-1086A, March 3, 2000 (Affidavit), April 17 and 18, 2000 (Deposition), July 12, 2000 (Reply Affidavit).
- Expert Report, Reply Expert Report, Deposition and Supplemental Report of Dennis W. Carlton in Re: CSX Transportation, Inc. V. Qwest Communications International, Inc.: In the United States District Court for the Middle District of Florida, Jacksonville Division, Civil Action No. 99-412-CIV-J-21C, July 19, 2000 (Expert Report), October 11, 2000 (Reply Expert Report), January 10-11, 2001 (Deposition), July 18, 2001 (Supplemental Report).
- Reply Declaration of Dennis W. Carlton in Re: Joint Application of Northpoint Communications and Verizon Communications for Authority to Transfer Control of Blanket Authorization to Provide Domestic Interstate Telecommunications Services as a Non-Dominant Carrier: Before the Federal Communications Commission, Washington DC, Docket No. 00-157, October 17, 2000 (Reply Declaration with H. Sider).
- Declaration and Reply Declaration of Dennis W. Carlton in Re: In the Matter of Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities: Before the Federal Communications Commission, Washington DC, Docket No. 00-195, December 1, 2000 (Declaration with K. Arrow and G. Becker), January 10, 2001 (Reply Declaration with K. Arrow and G. Becker).
- Report, Rebuttal Report, Deposition, Testimony, and Supplemental Report of Dennis W. Carlton in Re: Rambus Inc. v. Infineon Technologies AG, Infineon Technologies North America Corp.,

Infineon Technologies, Inc., Infineon Technologies Holding North America Corp., and Infineon Technologies Corp.: In the United States District Court for the Eastern District of Virginia, Richmond Division, Civil Action No. 3:00CV524, December 20, 2000 (Report), January 19, 2001 (Rebuttal Report), February 6, 2001 (Deposition), May 3, 2001 (Testimony), February 13, 2004 (Supplemental Report).

Reports, Rebuttal Reports, Deposition and Declaration of Dennis W. Carlton in Re: Micron Technology, Inc. v. Rambus Inc.: In the United States District Court for the District of Delaware, Civil Action No. 00-792, March 28, 2001 (Report), April 13, 2001 (Rebuttal Report), April 18, 2001 (Deposition), and August 17, 2001 (Report), September 17, 2001 (Rebuttal Report), Declaration (October 1, 2001).

Expert Report, Deposition and Testimony of Dennis W. Carlton in Re: Amgen Inc. v. Ortho Pharmaceutical Corp.: Endispute Arbitration, Chicago, Illinois, August 31, 2001 (Expert Report), November 27-28, 2001 (Deposition), May 9-10, 2002 (Testimony).

Testimony of Dennis W. Carlton in Re: Empirical Industrial Organization Roundtable: Before the Federal Trade Commission, Matter No. P015602 (September 11, 2001).

Expert Report of Dennis W. Carlton in Re: Artemio Del Serrone, et al. v. Philip Morris Companies, Inc., et al.: In the Circuit Court for the County of Wayne, State of Michigan, No. 00-004035 CZ, December 19, 2001.

Expert Report and Deposition of Dennis W. Carlton in Re: Cigarette Price-Fixing Litigation and related cases, Holiday Wholesale Grocery Company, et al. v. Philip Morris Incorporated, et al.: In the United States District Court for the Northern District of Georgia, Atlanta Division, No. 1:00-CV-0447-JOF, MDL No. 1342, December 19, 2001 (Expert Report), January 23, 2002 (Deposition).

Expert Report and Deposition of Dennis W. Carlton in Re: Flat Glass Antitrust Litigation: In the United States District Court for the Western District of Pennsylvania, No. 97-550, MDL NO. 1200, December 20, 2001 (Expert Report), February 4-6, 2002 (Deposition).

Expert Report, Supplemental Expert Report, and Deposition of Dennis W. Carlton in Re: Symbol Technologies et al v. Lemelson Medical et al and Cognex Corporation v. Lemelson Medical et al: In the United States District Court, District of Nevada, CV-S-01-701-PMP (RJJ) and CV-S-01-702-PMP (RJJ), December 14, 2001 (Expert Report), May 7, 2002 (Supplemental Expert Report), October 3, 2002 (Deposition).

Declaration and Reply Declaration of Dennis W. Carlton in Re: Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services: Before the Federal Communications Commission, Washington DC, CC Docket No. 01-337, FCC 01-360, March 1, 2002 (Declaration with H. Sider), April 22, 2002 (Reply Declaration with H. Sider and G. Bamberger).

Declaration, Deposition, Reply Declaration, and Preliminary Injunction Hearing Testimony of Dennis W. Carlton in Re: Sun Microsystems Inc. v. Microsoft Corporation: In the United States District Court, Northern District of California, San Jose Division, Civil Action No. C 02-01150 RMW (PVT), March 8, 2002 (Declaration), June 27, 2002 (Deposition), August 9, 2002 (Reply Declaration); In the United States District Court for the District of Maryland, Northern Division, MDL No. 1332, December 4, 2002 (Preliminary Injunction Hearing Testimony).

Declaration of Dennis W. Carlton in Re: In the Matter of Applications for Consent to the Transfer of Control of Licenses, Comcast Corporation and AT&T Corp., Transferors, to AT&T Comcast

Corporation, Transferee: Before the Federal Communications Commission, Washington, D.C., MB Docket No. 02-70, April 26, 2002

Declaration of Dennis W. Carlton In Re Shirley Robinson, et al., v. Bell Atlantic Corporation d/b/a Verizon Communications, et al., United States District Court Eastern District of Kentucky, Lexington Division, Case No. 01-98, August 30, 2002 (with R. Gertner).

Expert Report and Deposition of Dennis W. Carlton in Re: Duramed Pharmaceuticals, Inc. v. Wyeth-Ayerst Laboratories, Inc.: In the United States District Court, Southern District of Ohio, Western Division at Cincinnati, Civil Action No. C-1-00-735, August 19, 2002 (Expert Report), September 24, 2002 (Deposition).

Affidavit of Dennis W. Carlton in Re: USG Corporation, a Delaware Corporation, et al. In the United States Bankruptcy Court for the District of Delaware, Case No. 01-2094 (RJN), August 20, 2002 (Affidavit).

Expert Report, Expert Rebuttal Report, and Deposition of Dennis W. Carlton in Re: Sarah Futch Hall, d/b/a Travel Specialist, et al., on behalf of themselves and all others similarly situated v. United Airlines, Inc., et al.: In the United States District Court for the Eastern District of North Carolina Southern Division, No. 7:00-CV-123-BR(1), October 4, 2002 (Expert Report), November 13, 2002 (Expert Rebuttal Report), November 21, 2002 (Deposition).

Initial Report and Deposition of Dennis W. Carlton in Re: Sunrise International Leasing Corp., v. Sun Microsystems Inc.: In the United States District Court for the District of Minnesota, Civil Action No. 01-CV-1057 (JMR/FLN), March 27, 2003 (Initial Report with H. Sider), July 30, 2003 (Discovery Deposition).

Declaration and Reply Declaration of Dennis W. Carlton Before the Federal Communications Commission, Washington DC, in Re: Matter of Section 272(f) (1) Sunset of the BOC Separate Affiliate and Related Requirements, 2000 Biennial Regulatory Review Separate Affiliate Requirements of Section 64.1903 of the Commission's Rules, WC Docket No. 02-112, CC Docket No. 00-175, June 30, 2003 (Declaration with H. Sider and A. Shampine), July 28, 2003 (Reply Declaration with H. Sider and A. Shampine).

Economic Analysis, Response and Economic Analysis of Dennis W. Carlton, "Economic Analysis of the News Corporation/DIRECTV Transaction," submitted to the Federal Communications Commission, MB Docket No. 03-124, July 1, 2003 (Economic Analysis with J. Halpern and G. Bamberger); September 8, 2003 (Response with J. Halpern and G. Bamberger); October 2, 2003 (Economic Analysis to DOJ with J. Halpern and G. Bamberger).

Supplemental Declarations of Dennis W. Carlton in Re: Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services: Before the Federal Communications Commission, Washington DC, CC Docket No. 01-337, FCC 01-360, July 11, 2003 (with H. Sider), September 3, 2003 (with H. Sider).

Expert Report and Deposition of Dennis W. Carlton In Re: D. Lamar DeLoach, et al. v. Philip Morris Companies, Inc., et al. (R.J. Reynolds Tobacco Co.), In the United States District Court for the Middle District of North Carolina, Greensboro Division, Case No. 00-CV-1235, October 2, 2003 (Expert Report), October 30, 2003 (Deposition).

Report of Dennis W. Carlton on behalf of Verizon, November 18, 2003 (with K. Arrow, G. Becker, and R. Solow).

- Report and Deposition of Dennis W. Carlton In Re: Francis Ferko and Russell Vaughn as Shareholders of Speedway Motorsports, Inc. v. (NASCAR) National Association for Stock Car Auto Racing, Inc., International Speedway Corporation, and Speedway Motorsports, Inc.; In the United States District Court Eastern District of Texas Sherman Division, Case No. 4:02cv50, Honorable Richard A. Schell, December 15, 2003 (Report), January 21-22, 2004 (Deposition).
- Declaration, Deposition, and Rebuttal Declaration of Dennis W. Carlton In Re: CSC Holdings, Inc. v. Yankees Entertainment and Sports Network, LLC., before the American Arbitration Association, Arbitration Proceeding, Case No 13 181 02839 03, January 23, 2004 (Declaration), February 5, 2004 (Deposition), February 24, 2004 (Rebuttal Declaration).
- Expert Report, Deposition, Expert Report, Deposition and Testimony of Dennis W. Carlton In Re: Jamsports and Entertainment, LLC v. Paradama Productions, Inc., d/b/a AMA Pro Racing, Clear Channel Communications, Inc., SFX Entertainment, Inc., d/b/a Clear Channel Entertainment SFX Motor Sports, Inc., d/b/a Clear Channel Entertainment-Motor Sports, In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 02 C 2298, March 8, 2004 (Expert Report), April 19 and 20, 2004 (Deposition), September 28, 2004 (Expert Report), October 4, 2004 (Deposition), March 11, 14, 2005 (Trial Testimony).
- Affidavit in Reply, Second Affidavit, and Testimony of Dennis W. Carlton In Re: The Matter of an Appeal from Determinations of the Commerce Commission Between Air New Zealand Limited Between Qantas Airways Limited and The Commerce Commission, In the High Court of New Zealand Auckland Registry Commercial List Under The Commerce Act 1986, CIV 2003 404 6590, June 7, 2004 (Affidavit), July 6, 2004 (Second Affidavit), July 13-16, 2004 (Testimony).
- Expert Report and Deposition of Dennis W. Carlton in Re: J.B.D.L. Corp. d/b/a Beckett Apothecary, et al., v. Wyeth-Ayerst Laboratories, Inc., et al., Civil Action No. C-1-01-704. CVS Meridian, Inc., and Rite Aid Corp., v. Wyeth, Civil Action No. C-1-03-781, in the United States District Court for the Southern District of Ohio Western Division, July 7, 2004 (Expert Report), September 3, 2004 (Deposition).
- Declaration of Dennis W. Carlton on behalf of Bellsouth Telecommunications, Inc., in the matter of AT&T Corp., v. Bellsouth Telecommunications, Inc., before the Federal Communications Commission, Washington, DC 20554, July 20, 2004 (with H. Sider).
- Expert Report, Sur-Reply Expert Report, Deposition, Affidavit and Supplemental Report of Dennis W. Carlton in Re: Flat Glass Antitrust Litigation: In the United States District Court for the Western District of Pennsylvania, Master Docket MISC No. 97-550, relates to Jeld-Wen, Inc. Docket No. 2-99-875, July 6, 2004 (Expert Report), September 9, 2004 (Sur-Reply Expert Report), November 1-2, 2004 (Deposition), July 20, 2005 (Affidavit), August 16, 2005 (Supplemental Report).
- Expert Report, Declaration and Deposition of Dennis W. Carlton (T-Mobile, Sprint PCS, AT&T Wireless, Cingular, Verizon Wireless Reports) in Re: Wireless Telephone Services Antitrust Litigation: In the United States District Court Southern District of New York, 02 Civ. 2637, December 20, 2004 (Expert Report), February 9, 2005 (Deposition).
- Declaration, Testimony, Reply Declaration/Rebuttal, Joint Applicants' Statement, Ex Parte, Rebuttal Testimony and Rejoinder Testimony of Dennis W. Carlton in Re: In the Matter of the Proposed Merger of AT&T Corp.,(AT&T) and SBC Communications Inc. (SBC), Before the FCC, February 21, 2005_(Declaration with H. Sider);Before the New Jersey Public Utility Commission, May 4,

2005 (Testimony with H. Sider); Before the FCC, May 9, 2005 (Reply Declaration/Rebuttal with H. Sider); Before the Pennsylvania Utility Commission, May 12, 2005 (Joint Applicants' Statement with H. Sider); Before the FCC, June 28, 2005 (Ex Parte with H. Sider); Before the Pennsylvania Public Utility Commission, July 15, 2005 (Rebuttal Testimony with H. Sider); Before the Pennsylvania Public Utility Commission, August 5, 2005 (Rejoinder Testimony with H. Sider).

Expert Report of Dennis W. Carlton in Re: In the matter of Echostar Satellite, L.L.C., v. Fox Television Holdings, Inc., Fox/UTV Holdings, Inc., News Corporation: Before the American Arbitration Association, Case No. 71 472 E 00690 04, March 2, 2005 (with G. Bamberger).

Declaration, Reply Declaration, Proprietary Report and Redacted Reports of Dennis W. Carlton in Re: In the matter of Verizon Communications Inc., and MCI, Inc., Applications for Approval of Transfer of Control, Before the FCC (Federal Communications Commission), Washington, DC 20554, WC Docket No. 05-75, March 10, 2005 (Declaration with G. Bamberger and A. Shampine), May 24, 2005 (Reply Declaration with A. Shampine), August 5, 2005 (Proprietary and Redacted Report with G. Bamberger and A. Shampine), September 9, 2005 (Redacted Report with G. Bamberger and A. Shampine).

Expert Report, Deposition, Affidavit, Supplemental Report and Testimony of Dennis W. Carlton in Re: Celanese Ltd., et al. v. JO Tankers AS, et al., April 8, 2005 (Expert Report); and May 6, 2005 (Deposition); June 10, 2005 (Affidavit); October 10, 2005 (Supplemental Report), November 9-10, 2005 (Testimony).

Affidavit of Dennis W. Carlton in Re: In the matter of Beatrice C. Romero vs. Philip Morris Price Fixing Allegations: In the United States First District Court State of New Mexico County of Rio Arriba, April 15, 2005.

Deposition, Expert Reports, Written Direct Examination, Deposition and Trial Testimony of Dennis W. Carlton in Re: United States of America v. Philip Morris USA Inc. (f/k/a Philip Morris Incorporated), et al., In the United States Court for the District of Columbia, Civil Action No. 99-CV- 2496 (GK), September 10, 2002 (Deposition); April 29, 2005 (Expert Report); May 3, 2005 (Written District Examination); May 10, 2002 (Expert Report); May 23, 2005 (Written Direct Examination); May 23, 2005 (Deposition), June 2, 2005 (Trial Testimony).

Deposition and Expert Submission of Dennis W. Carlton in Re: 2003 NPM Adjustment Proceeding pursuant to Master Settlement Agreement, November 22, 2005 (Deposition), October 10, 2005 (Expert Submission), January 30, 2006 (Expert Final Submission).

Declaration of Dennis W. Carlton in Re: Covad Communications, et.al. v. Bell Atlantic, et. al., Civil Action No.:1:99-CV-01046, June 10, 2005 (Declaration).

Joint Report by Dennis W. Carlton and Alan S. Frankel In the Matter of the Decision of the Office of Fair Trading dated 6 September 2005 No. CA 98/05/05 of 6 September 2005 in Case CP/0090/00/S, Competition Appeal Tribunal (U.K.), February 27, 2006 (Report).

Expert Report and Deposition of Dennis W. Carlton in Re: Fresh Del Monte Pineapples Antitrust Litigation In the United States District Court for the Southern District of New York, Civil Action No. 03-CV-10230 (RMB), February 3, 2006 (Expert Report); February 22, 2006 (Deposition).

- Expert Report of Dennis W. Carlton in Re: Marjorie Ferrell, et al., v. Wyeth-Ayerst Laboratories, Inc., et al. In the United States District Court for the Southern District of Ohio, Civil Action No. C-1-01-447, May 3, 2006 (Expert Report).
- Declaration of Dennis W. Carlton (with Hal Sider) in Re: AT&T Corporation and BellSouth Corporation., Application for Approval of Transfer of Control. in the Federal Communications Commission, WC Docket 06-74, March 29, 2006 (Declaration), June 19, 2006 (Reply Declaration), August 21, 2006 (Declaration).
- Declaration of Dennis W. Carlton in Re: Wireless Telephone Services Antitrust Litigation, Michael Freeland, et al., on behalf of himself and others, v. AT&T Corporation, et al. In the United States District Court, Southern District of New York, Master File 02 Civ. 2637 (DLC) and Separate File 04 Civ. 8653 (DLC), May 5, 2006 (Declaration).
- Declaration, Deposition, Direct Testimony and Rebuttal Testimony of Dennis W. Carlton in Re: Certain Baseband Processor Chips and Chipsets, Transmitter and Receiver (Radio) Chips, Power Control Chips, and Products Containing Same, Including Cellular Telephone Handsets. In the United States International Trade Commission, May 19, 2006 (Declaration), June 1, 2006 (Deposition), June 5, 2006 (Direct Testimony), June 7, 2006 (Rebuttal Testimony) July 10, 2006 (Live Testimony).
- Expert Report, Supplemental Expert Report, Second Supplemental Expert Report, Reply Expert Report, Deposition, Statement, and Testimony of Dennis W. Carlton in Re: Verizon Services Corp., Verizon Communications Inc., MCI Communications Corp., and Verizon Business Global LLC vs. Cox Fibernet Virginia, Inc., Cox Virginia Telecom, Inc., Cox Communications Hampton Roads, LLC, CoxCom, Inc., and Cox Communications, Inc., in the US District Court for the Eastern District of Virginia, Case No. 1:08-cv-157 CMH-TRJ, May 30, 2008 (Expert Report), June 13, 2008 (Supp. Expert Report), July 2, 2008 (Second Supp. Expert Report), July 14, 2008 (Expert Report in Reply to Expert Report of Michael C. Keeley), July 29, 2008 (Deposition), September 17, 2008 (Statement), September 18, 22, and 29, 2008 (Testimony).
- Declaration, and Reply Declaration of Dennis W. Carlton (with A. Shampine and H. Sider) in Re: Verizon Wireless and ALLTELL Holdings LLC, in the Federal Communications Commission, WT Docket 08-95, June 13, 2008 (Declaration), August 19, 2008 (Reply Declaration).
- Initial Submission and Final Submission of Dennis W. Carlton in Re: 2006 NPM Adjustment Proceeding pursuant to Master Settlement Agreement, October 6, 2008 (Initial Submission Expert Report), January 16, 2009 (Final Submission Expert Report).
- Expert Report of Dennis W. Carlton in Re: Rosemary D'Augusta et. al. v Northwest Airlines Corp and Delta Air Lines, Inc., in the US District Court for the Northern District of California, Civil Action No. :3:08-CV-3007 VRW, October 17, 2008 (Expert Report)
- Declaration of Dennis W. Carlton in Re: Vibo Corp Inc. v Jack Conway in the US District Court Western District of Kentucky, Case No. 03:08-CV-571-JBC, December 1, 2008 (Declaration).
- Expert Report, and Supplemental Expert Report of Dennis W. Carlton and Mark Israel in Re: Toys "R" Us-Delaware, Inc., and Geoffrey, Inc. v Chase Bank USA, N.A., for the American Arbitration Association New York, New York, No. 13-148-02432-08, February 27, 2009 (Expert Report), March 23, 2009 (Supplemental Expert Report).