

other carriers: $s = n/(n + a)$ where a is the number of outbound minutes sent by the alliance partner). In such a case, keeping n unchanged but increasing s (“minute inflation”) or decreasing N_i (call turnaround) increases T more than in a case where n and s were initially small.

Thus, the dangers to the U.S. from such a strategy are greatest when the foreign carrier integrates or affiliates with a *smaller* rather than a larger U.S. carrier. The reason is that the role of gaming the ISP is to maximize the extent of profit diversion from U.S. carriers. This is in contrast to the “innocent” case where the motive is to enter the market for purposes of reducing the assumed double marginalization (see first few paragraphs of Section I). In such a case, one would expect the foreign carrier to affiliate with a larger rather than a smaller U.S. carrier, because doing so allows it to offer a price reduction directly to more subscribers. Thus, affiliating with a small U.S. carrier may superficially appear pro-competitive, but in fact carries a greater risk that the underlying motivation may be to game the ISP at the expense of U.S. interests.

E. U.S. Carriers Lack Comparable Opportunities to Bypass the ISP in Less Competitive Foreign Markets

It is sometimes asked whether U.S. carriers do not have similar ability to game the ISP process at the foreign end and whether such ability would negate the above concerns. The answer to both questions is no.

First, U.S. carriers do lack comparable bypass opportunities in many foreign markets, because such markets are often far less open to competition and to entry by U.S. carriers than is the U.S. market today, and certainly less open than the U.S. market will become if the FCC adopts the basic rules outlined in its *Foreign Participation NPRM*. For example, consider the case of Mexico. International Simple Resale is prohibited in Mexico. In addition, only Telmex is permitted to negotiate settlement rates with foreign

carriers for switched traffic, a restriction which significantly weakens their bargaining position towards Telmex.

Moreover, many foreign markets do not offer the highly discounted, competitive wholesale rates available to a foreign carrier in the U.S. market if it wishes to pursue switched resale. This is for the simple reason that many foreign countries are dominated by one carrier, hence alternative competitive providers of transport facilities are absent.

Second, even if U.S. carriers had comparable bypass opportunities—which they do not—it is far from obvious that global welfare would be enhanced by having carriers engaging in rent seeking behavior aimed at gaming the ISP. Thus, safeguards to prevent such gaming would still be appropriate.

F. Potential Harm Is Substantial

It has also been asked whether the potential harm is significant. To address this, I have performed illustrative simulations of the increased settlement payments that would be made by non-alliance U.S. carriers at their current level of outbound minutes if a dominant foreign carrier was able to game the ISP through call turnaround or call inflation.

EXAMPLE: I consider the impact on total settlement payments made to Mexico by carriers except Sprint if the new Sprint/Telmex alliance were to engage in call turnaround or call inflation. (The simulations use the formula for L in Section II.B: $L = (rts) + r(s - s^*)(N_i - t)$.) The base figures are from the 1996 Preliminary FCC 43.61 Report Data. There 948 million inbound minutes from Mexico (N_i) and 2,381 million outbound minutes (N_o). Shares of outbound minutes are: AT&T 58%, MCI 23%, Sprint 10%, WorldCom 4% and Others 5%. The settlement rate is $r = 39.5$ cents/minute.

Figure 1 in the Appendix shows the impact that call turnaround of various hypothetical percentages of inbound minutes (up to 25%) by the Sprint/Telmex alliance

would have on the settlement payments made by all carriers except Sprint. (It also shows separately the effect on the largest carrier, AT&T, and on “All” carriers, which includes Sprint; however, the effect on Sprint is inconsequential, because as explained below, Sprint can be made whole by its partner Telmex.) Turnaround of 10% of inbound minutes raises payments of all other carriers by approximately \$42 million. Turnaround of 20% raises payments by about \$84 million, and 25% by about \$105 million. These hypothetical turnaround percentage figures do not seem far fetched. (Figure 2 shows the resulting market shares of outbound minutes associated with various percentages of turnaround. For example, turnaround of 10% of all inbound minutes would cause Sprint’s market share of outbound minutes to increase from about 10% to only about 14%, because the initial ratio of total outbound to inbound minutes is about 2.4 to 1.)

Figure 3 shows the effect of call inflation that artificially augments Sprint’s share of outbound minutes, thereby diluting others’ share of credits for inbound minutes (e.g., through call re-origination schemes that were described in Section II.C). Inflating Sprint’s share of outbound minutes by 10% points causes settlement payments made by all other carriers to rise by over \$29 million, while a 20% inflation causes a rise of \$58 million. Figure 4 shows the resulting market shares of outbound minutes associated with various percentages of call inflation by Sprint.

Figure 5 shows the impact of call turnaround on U.S. carriers’ average cost (AC) and marginal costs (MC). As shown in Section II.A, the AC of termination is constant across all U.S. carriers (due to the proportionate return system) and equal to $r(1 - N_i/N_o)$. Thus, AC unambiguously increases due to call turnaround or call dilution—as these cause a deterioration of the ratio of inbound to outbound minutes, N_i/N_o . For a carrier with initial market share x , $MC = r[1 - (N_i/N_o)(1-x)]$. While in rare cases the MC for the largest carrier could fall slightly due to call turnaround (or call inflation), the more likely effect is for that carrier’s MC also to increase; and the MC of all other carriers necessarily

will increase. In Figure 5, corresponding to the figures for Mexico, marginal costs in fact rise for all carriers, including the largest AT&T.

Figure 6 shows the effects on AC and MC of call inflation. It illustrates the counter-intuitive possibility that the MC for AT&T, as the largest carrier, can decline with relatively low levels of turnaround. However, the effect is only slight, and is reversed as the percentage turnaround increases. More importantly, the MC of smaller carriers such as MCI (and others such as WorldCom, that are not shown) increase. An increase in marginal costs, of course, puts upward pressure on carriers' retail prices, and higher retail prices would harm consumers.

Mexico is perhaps the most worrisome country. However, since the increase settlement payments to Mexico alone can comfortably exceed \$100 million, similar calculations for all foreign monopoly countries put the total potential losses in the hundreds of millions. Moreover, these examples may understate the potential harm. This is because as telephone penetration increases in foreign countries, one can expect—absent gaming—an increase in the amount of calling in both directions. Therefore, a given percentage turnaround of calls, as applied to a larger base of incoming minutes, would cause a larger change in payments by U.S. carriers relative to a no-gaming situation. To the extent dominant foreign carrier entry into the U.S. market exacerbates such gaming, the opportunity costs to the U.S. in the future may be even higher than today, if settlement rates do not fall significantly in the interim.

The above calculations are performed assuming that the number of outbound minutes by non-alliance U.S. carriers does not drop. Of course, the increased settlement payments will be lower if these carriers' outbound minutes do drop, as indeed they are likely to do because of the increase in these carriers' costs. But this observation is not especially reassuring: the drop in these carriers' output, while mitigating carriers' losses,

harms consumers. The dominant foreign carrier would accept the reduction in U.S. outbound minutes as a small price to pay for substantial increase in its revenues on remaining outbound minutes, induced by the reduction in credits for inbound minutes.

We know that the foreign carrier typically would be willing to accept such a reduction because currently, the U.S. settlement rates with most foreign dominant carriers are below the levels that foreign carriers would prefer. For example, in the current round of negotiations with Telmex, Telmex requested a 25% *increase* in settlement rates, from 39.5 cents to around 50 cents. And less developed countries frequently ask for “non 50-50” splits, that would allow them higher settlement rates for terminating traffic in their home countries. Put another way, a foreign carrier’s price for termination is constrained below its preferred monopoly level—taking as given the state of IMTS competition among U.S. carriers. If it could, it therefore would raise this price despite the reduction in outbound minutes this would induce.

In short, I have argued that: (1) the likely harm to U.S. carriers is likely to be substantial at their initial level of outbound minutes; and (2) to the extent this harm is mitigated by reducing those minutes, consumers are likely to be harmed.

The above discussion does not incorporate the potential beneficial effect foreign entry might have, at least in the short term, if the alliance competes only by retail prices and not through gaming the ISP. The foreign carrier entering the U.S. market, whether as facilities based or through affiliation with a U.S. carrier, would have incentives to reduce the margin earned by its alliance partner and, especially, by other U.S. carriers if margins were above competitive levels as sometimes alleged, in order to stimulate outbound minutes and therefore termination payments. (In fact, given the proportionate return system, the alliance can gain by reducing retail price even if all carriers are originally pricing at marginal cost, because its increased share of outbound minutes dilutes others’ share of inbound.)

Such incentives to reduce “double marginalization,” discussed in Section I, would lead the foreign carrier to lower its retail price, an effect that benefits consumers. If the U.S. retail IMTS market were sufficiently non-competitive, the downward pressure on retail prices due to the foreign carrier’s desire to reduce double marginalization *might* outweigh the upward pressure due to its raising of other carriers’ costs. I believe that on balance the tradeoff is likely to be adverse.⁸ However, the more important point is this: the possibility that foreign carrier entry might be beneficial on balance should not deflect us from worrying about and acting to prevent possible gaming of the ISP, for one simple reason: one can design safeguards that preserve the beneficial potential of foreign entry while limiting the risks.

III. RESALE AND FACILITIES-BASED ENTRY POSE SIMILAR RISKS THAT CAN BE ADDRESSED VIA SIMPLE SAFEGUARDS

The risks that entry into the U.S. IMTS market by a dominant foreign carrier poses by exacerbating the scope for gaming the international settlements process on traffic between the U.S. and that foreign country are substantially the same whether such

⁸ This is because to the extent U.S. IMTS markets could become more competitive, added competition could be brought by players other than the dominant foreign carrier. Such entry also would reduce whatever supra-competitive retail margins might exist and thus retail prices, but without risking gaming of the ISP by the dominant foreign carrier on traffic to and from its country. Thus, allowing a dominant foreign carrier to offer service to its country from the U.S. could temporarily accelerate the reduction in U.S. IMTS margins that is likely to occur in any case; but in exchange for these short lived potential benefits, it risks a more permanent raising of other carriers’ costs from gaming of the ISP. The reason is that the foreign carrier’s monopoly in its country, and thus ability to game the ISP, is likely to erode rather slowly, especially in countries that have not made serious commitments (and not just paper commitments) to increasing domestic competition.

entry is “facilities based” or through switched resale.⁹ Comparable safeguards are therefore appropriate.

As I explained earlier, the dominant foreign carrier only needs the cooperation of a U.S. facilities based carrier to partake in schemes that enriches the foreign operator at the expense of other U.S. carriers and consumers. The bottleneck that is the source of the problem and permits gaming is not control of U.S. facilities, but at the foreign end. Since there are competing U.S. carriers vying to provide wholesale transport capacity, a foreign carrier will find no shortage of willing partners, especially ones whose initial market shares are low and therefore stand to lose less (hence also require less compensation) from behavior that reduces the credits for inbound minutes available to U.S. carriers. Moreover, the goal of market liberalization and increased competition is to permit the emergence of even more facilities providers. As wholesale markets in liberalizing countries become increasingly competitive, wholesale capacity to be used for resale will become ever more readily available to dominant foreign carriers—for good reasons or bad.

Therefore, the distinction between “facilities-based” entry and entry through resale, which already is quite strained, will become increasingly untenable. Consider for example the recently approved Sprint-Telmex joint venture. Had the venture been formed as a facilities-based carrier, it would have triggered certain safeguards, notably the requirement that the settlement rate with Mexico be immediately reduced to the proposed benchmark level as a condition for approving entry. But by structuring the relationship

⁹ The distinction between facilities-based entry and entry through reselling the services of another facilities-based carrier is important for certain issues. For example, it may affect the ability to detect and prevent network access discrimination. When a carrier that controls bottleneck facilities needed by others to provide services that compete with ones it offers, the bottleneck carrier may be better able to disguise or “justify” discrimination in the terms of access that it grants to competitors when it is providing the competing services through its own integrated facilities than when it is reselling the services of other carriers. Access discrimination as between different carriers may be more detectable and more difficult to rationalize than disparate treatment of other carriers as compared with one’s own retail operation. However, the distinction between facilities based entry and entry through resale is *not* material for the particular issue raised in this paper—gaming the ISP.

as a switched resale venture, even though wholly owned by Telmex and Sprint, the venture would escape this safeguard. This distinction is not meaningful economically, and according different regulatory treatment based on it is not warranted.

In principle, the cooperation of a U.S. facilities-based carrier (and any requisite offsetting compensation to that carrier) need not require a formal affiliate relationship. Much could potentially be achieved through private contracts. For this reason, policy makers should be on the lookout for behavior by dominant foreign carriers that involves gaming the ISP even absent formal affiliate relationships. However, it is reasonable to presume that an affiliate relationship offers certain advantages over other less formal relationships, or else the participants would not opt for it in the first place. But if an affiliate relationship is superior to arms' length contracting for pro-competitive purposes, as argued by carriers when petitioning for such authority, it stands to reason that such an affiliation can also be more conducive to anti-competitive purposes such as gaming the settlements process.

In particular, any offsetting financial transfers that may be necessary to compensate one party or another could be undertaken in a less detectable manner—and perhaps in a more lawful manner as well—through an affiliate than otherwise. I identified some such possibilities in Sections II.B and II.C. Another possibility worth mentioning here is that a joint venture formed for ostensibly legitimate purposes (and, indeed, gaming the ISP need not preclude the existence of legitimate purposes as well) could serve as a cover for disguising behavior such as call turnaround designed to game the ISP. A spike in the number of outbound minutes of Sprint, that in reality were due to increased call turnaround, might plausibly be “explained” instead as reflecting increased marketing and promotional efforts by STC to customers for the U.S.-Mexico route, more easily than could a comparable increase in Sprint’s traffic to Mexico absent an affiliation.

Disparities in the regulatory treatment of resale versus facilities-based entry therefore are not justified on grounds of differential competitive risks, at least as regards gaming the ISP (but also more generally, such as in their scope for anti-competitive pricing). A more lax regulatory treatment of resale than of facilities based entry will therefore inefficiently bias the mode of entry towards resale. Resale may be chosen even where facilities-based would be more efficient; e.g., a foreign carrier may prefer to invest in or acquire a U.S. carrier, but would instead opt for resale to escape the stronger safeguards. Avoiding such distortions requires comparable regulatory treatment of these entry modes.

The question has been raised whether safeguards against gaming the ISP really are necessary. In particular, it has been suggested that foreign markets will become more competitive with the implementation of the WTO commitments and that the FCC's Benchmarks policy is an adequate remedy in the interim. Regarding the advent of competition, we should not delude ourselves that the road will be easy. As in the U.S. local market, competition will take time. Regarding the FCC's Benchmarks policy, while the policy is laudable, its success cannot be taken for granted. Foreign carriers are already challenging it. Therefore, counting on the Benchmarks policy to address all ills—including prevention of gaming—may be quite risky.

Moreover, there is a sound economic basis for requiring as a condition for approving entry by a dominant foreign carrier—whether facilities-based or resale—that the settlement rate with that country should be reduced, and more rapidly than stipulated in the FCC's Benchmarks Order. The FCC's benchmarks policy is beneficial independently of foreign carrier entry—because lowering settlement rates towards true costs will permit a reduction in prices to consumers. Approving dominant foreign carrier entry calls for reductions beyond this stipulated path, for at least two reasons.

First, foreign entry allows the dominant foreign carrier additional profits, or it would not be seeking entry authority. Thus, additional concessions can be obtained in exchange for approving such entry, beyond those already required by the Benchmarks policy. If the concessions are in the form of a reduction in the settlement rate, or any other pro-competitive measure, they would benefit U.S. consumers.

Second, as demonstrated by the analysis in this paper, entry by a dominant foreign carrier exacerbates the dangers that it will game the settlements process in ways harmful to U.S. welfare. Reducing the settlement rate both diminishes the incentive to engage in such gaming, and mitigates the consequences of any such residual conduct.

Beyond this pro-consumer remedy of reducing settlement rates, one could think of relatively simple additional safeguards to limit the scope of entry for purposes of gaming the ISP, without limiting the pro-competitive potential of such entry.

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University of California, Los Angeles: M.A. in Economics, March 1978
London School of Economics: B.Sc. in Economics (1st Class Honors), August 1976

PROFESSIONAL EXPERIENCE

Georgetown University, Department of Economics

Professor, June 1993–present
Associate Professor, August 1987–May 1993
Assistant Professor, January 1983–July 1987 (part time in Fall 1982)

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Undergraduate Courses Taught:

Antitrust
Industrial Organization
International Economics
Macroeconomic Theory
Mergers & Corporate Control
Microeconomic Principles
Topics in Competition and Regulation

Graduate Courses Taught:

Industrial Organization
Macroeconomic Theory I
Macroeconomic Theory II
Monetary Policy
Microeconomics: special course in Pew
Freedom Fellows Program

Council of Economic Advisers, Executive Office of the President

Senior Economist, June 1995–May 1996 (part-time consultant April & May 1995 and June 1996).

Served as the senior economist principally responsible for antitrust, regulated industries, and other industrial organization matters. Work included: 1996 Telecommunications Act; competition in international satellite services; competition in the electric utility industry; reforming the patent and trademark office; intellectual property rights; international trade disputes; health care.

U.S. Department of Justice, Antitrust Division

Consultant, June 1996–present
Economist (part time), January 1983–May 1995
Economist (full time), October 1980–December 1982.

Regulatory

Analyzed competitive issues posed by Bell Company entry into long-distance telecommunications services and submitted affidavits on behalf of Justice Department to Federal Communications Commission.

Testimony

Presented expert testimony to courts in successful challenges of merger and of consent decree.

Mergers

Investigated mergers in several industries and helped to design appropriate relief.

Business Practices

Worked on vertical-restraints cases (tying, exclusive dealing, resale price maintenance, exclusive territorial arrangements) and horizontal-conduct cases (collusion and predation).

Legislation, Congressional Matters, Division Reports

Provided input to Antitrust Division's Merger Guidelines (1992) and Vertical Restraints Guidelines (1984). Helped draft Division comments on various Congressional legislation and responses to inquiries in several areas including price discrimination and dealer termination.

Cooperation with Foreign Competition Authorities

Interacted with competition officials from several countries and agencies. Helped comment on following documents: Canadian Fair Trade Commission's guidelines on predatory pricing, and on price discrimination; Japanese Fair Trade Commission's guidelines on distribution systems, on sole import distributorships, and on joint R&D; Korean Fair Trade Commission's guidelines on unfair trade practices in international agreements; OECD papers on predatory pricing, on competition policy and franchising, and on interaction between trade and competition policies.

Other Professional Experience

Senior Advisor, The Brattle Group, Economic, Environmental & Management Counsel, Cambridge, MA and Washington DC, November 1996-present.

OECD: Lecturer in Seminar on Vertical Restraints for competition officials from Czech Republic, Hungary, Poland, and Slovakia in Cracow, Poland, November 20-22, 1995.

Consultant in private antitrust and regulatory matters.

ILADES: Participated in designing and teaching a short course in industrial organization to policy makers and executives in Santiago, Chile, June 1994.

Pew Freedom Fellows Program: Taught short course in microeconomics to twenty Fellows from transition economies, annually, January 1993–present. (Fellows hold middle-level or upper-level positions in government and private business.)

Center for Economic Development, Slovakia: Academic Advisory Board.

World Bank: Consultant.

Abt Associates/USAID: Advised Government of Zimbabwe in Harare on formulating antitrust law, summer 1993 (consultant to Abt, work funded by USAID's Implementing Policy Change Project).

LANGUAGES

French, Hebrew, Romanian (speak and read all three fairly well; write French and Hebrew adequately)

HONORS

U.S. Department of Justice, Antitrust Division: Special Achievement Awards

Brookings Institution: Research Fellow, 1979-80

University of California, Los Angeles: Earhart Fellowship, 1977-78

University of California, Los Angeles: Regents Fellowship, 1976-77

London School of Economics: Premchand Prize in Monetary Economics, 1976.

PUBLICATIONS

Refereed Journals

"A Quality-Signaling Rationale for Aftermarket Tying," *Antitrust Law Journal*, vol. 64 (Winter 1996): 387-404 (with Gregory J. Werden).

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"Divisionalization and Entry Deterrence," *Quarterly Journal of Economics*, vol. 101 (May 1986): 307-321 (with Earl Thompson).

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"Contestable Markets: An Uprising in the Theory of Industry Structure: Comment," *American Economic Review*, vol. 73 (June 1983): 488-490 (with Robert Reynolds).

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"Telecommunications Reform in the United States: Promises and Pitfalls," in Paul J.J. Welfens and George Yarrow, Eds., *Telecommunications and Energy in Systemic Transformation*, Heidelberg and New York: Springer, 1997.

"Protecting Intellectual Property by Excluding Infringing Imports: An Economist's View of Section 337 of the U.S. Tariff Act," *Patent World*, Issue 25 (September 1990): 29-35.

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"Vertical Restraints," published in German by *Forschungsinstitut für Wirtschaftsverfassung und Wettbewerb* by E.V. Köln, Heft 5, 1984.

DISCUSSION PAPERS AND WORK IN PROGRESS

"Competition in International Satellite Services: Wither INTELSAT Restructuring?" November 1997.

"Competitive Concerns with Gaming of the International Settlements Process under Asymmetric Liberalization of International Telecommunications and Above-Cost Settlement Rates," Affidavit submitted on behalf of AT&T to FCC, in proceedings on *Rules and Policies on Foreign Participation in the U.S. Telecommunications Market*, November 18, 1997.

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"Towards Competition in International Satellite Services: Rethinking the Role of INTELSAT," paper distributed at OECD Ad Hoc Meeting of Experts on Competition in Satellite Services, Paris, June 1995 (with Joseph E. Stiglitz and Eric Wolff).

"Competitive Markets in Generation: Economic Theory and Public Policy," paper presented at conference on "Electric Utility Restructuring: Whither Competition?" organized by International Association for Energy Economics Los Angeles Chapter, and Micronomics Inc., Los Angeles, May 1995.

"Exclusive Dealing for Rent Extraction," mimeo, January 1994 (with Serge Moresi and Francis O'Toole).

"Option Values of Deposit Insurance and Market Values of Net Worth: Some Evidence for U.S. Banks," mimeo, December, 1992 (with Behzad Diba and Chia-Hsiang Guo).

"Do Sunk Costs Discourage or Encourage Collusion?" U.S. Department of Justice, Antitrust Division, EPO Discussion Paper 85-10 (September 1985).

"Signalling Equilibria Based on Sensible Beliefs: Limit Pricing Under Incomplete Information," U.S. Department of Justice, Antitrust Division, EPO Discussion Paper 84-4 (May 1984) (with Maxim Engers).

OTHER SCHOLARLY ACTIVITIES

Seminars Presented

Bellcore
Bureau of Competition Policy, Industry Canada
California State University, Hayward
Columbia University
ENSAE, Paris
Federal Trade Commission
Georgetown University
George Washington University
International Trade Commission
Johns Hopkins University
New York University
Pennsylvania State University

Simon Fraser University
Tulane University
U.S. Department of Justice
University of Alberta
University of British Columbia
University of Calgary
University of California, Davis
University of California, Los Angeles
University of Maryland
University of Montreal
University of Pennsylvania
University of Toronto
University of Virginia

Conferences: Speaker or Discussant

25th Annual Telecommunications Policy Research Conference, Washington DC, September 1997.
Telecommunications seminar series, Canadian Bureau of Competition, Ottawa, September 1997
Competition Policy Workshop, The World Bank, June 1997.
Economics of Interconnection Forum, Federal Communications Commission, Washington DC, May 1996
Authors' Symposium on Competition Policy and Intellectual Property Rights, Canadian Bureau of Competition, Aylmer, Quebec, May 1996
Electric Generation Association, Annual Meetings, West Palm Beach, April 1996
"Wheeling & Dealing: Opportunities and Challenges in the New Electric Industry," conference sponsored by the Center for Regulatory Studies, Illinois State University and the Institute of Government and Public Affairs, University of Illinois-Urbana, Chicago, April 1996
"New Social and Economic Approaches to a Multimedia World," OECD Symposium, Tokyo, March 1996
"Telecommunications and Energy Regulation in Transition Economies," Center for Economic Development, Bratislava, October 1995
"Electric Utility Restructuring: Whither Competition?" organized by International Association for Energy Economics Los Angeles Chapter, and Micronomics Inc., Los Angeles, May 1995.
"New Learning on Barriers to Entry in Competition Policy," Canadian Bureau of Competition, Ottawa, March 1995
Southeastern Economic Theory Meetings, Charlottesville, October 1994
EARIE Conference, Tel Aviv, September 1993
Midwest International Economics Meetings, Pittsburgh, October 1992
Latin American Econometric Society, Mexico City, September 1992
Conference on Industrial Organization, Carleton University, Ottawa, July 1991
Workshop on Strategic and Dynamic Aspects of International Trade, SUNY at Stony Brook, July 1991
AEI Conference on "Innovation, Intellectual Property and World Competition," Washington DC, September 1990
EARIE Conference, Lisbon, September 1990
Conference on "International Trade and Technology," Brussels and London, November 1989
EARIE Conference, Budapest, August 1989
Conference on Strategy and Market Structure, Dundee University, Dundee, August 1988
Conference on "Firm Ownership and Competition," Graduate School of Business, Stanford University, June 1987
EARIE Conference, Berlin, August 1986
AEA Annual Meetings, Dallas, December 1984

Referee for Professional Journals

American Economic Review
Canadian Journal of Economics
Economica
Economic Journal
International Economic Review
International Journal of Industrial Organization
Journal of Business
Journal of Business Economics
Journal of Economic Dynamics and Control
Journal of Economic Theory
Journal of Economics and Management Strategy
Journal of Industrial Economics
Journal of Political Economy
Managerial and Decision Economics
Quarterly Journal of Economics
Quarterly Review of Economics and Business
RAND Journal of Economics
Review of Industrial Organization
Review of International Economics
Scandinavian Journal of Economics

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Several economics departments (identities disclosed on request)

Regulatory

Analyzed competitive issues posed by Bell Company entry into long-distance telecommunications services and submitted affidavits on behalf of Justice Department to Federal Communications Commission.

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Center for Economic Development, Slovakia: Academic Advisory Board.

World Bank: Consultant.

Abt Associates/USAID: Advised Government of Zimbabwe in Harare on formulating antitrust law, summer 1993 (consultant to Abt, work funded by USAID's Implementing Policy Change Project).

LANGUAGES

French, Hebrew, Romanian (speak and read all three fairly well; write French and Hebrew adequately)

HONORS

U.S. Department of Justice, Antitrust Division: Special Achievement Awards
Brookings Institution: Research Fellow, 1979-80
University of California, Los Angeles: Earhart Fellowship, 1977-78
University of California, Los Angeles: Regents Fellowship, 1976-77
London School of Economics: Premchand Prize in Monetary Economics, 1976.

PUBLICATIONS

Refereed Journals

- "A Quality-Signaling Rationale for Aftermarket Tying," *Antitrust Law Journal*, vol. 64 (Winter 1996): 387-404 (with Gregory J. Werden).
- "The Non-Existence of Pairwise-Proof Equilibrium," *Economics Letters*, vol. 49 (1995): 251-259 (with R. Preston McAfee).
- "Equity as a Call Option on Assets: Some Tests for Failed Banks," *Economics Letters*, vol. 48 (1995): 389-397 (with Behzad Diba and Chia-Hsiang Guo).
- "Parallel Imports, Demand Dispersion, and International Price Discrimination," *Journal of International Economics*, vol. 37 (November 1994): 167-195 (with David Malueg).
- "Opportunism in Multilateral Vertical Contracting: Nondiscrimination, Exclusivity, and Uniformity," *American Economic Review*, vol. 84 (March 1994): 210-230 (with R. Preston McAfee).
- "Preemptive Investment, Toehold Entry, and the Mimicking Principle," *RAND Journal of Economics*, vol. 22 (Spring 1991): 1-13 (with David Malueg).
- "Patent Protection through Discriminatory Exclusion of Imports," *Review of Industrial Organization*, vol. 6 (No. 3, 1991): 231-246.
- "Third-Degree Price Discrimination and Output: Generalizing a Welfare Result," *American Economic Review*, vol. 80 (December 1990): 1259-1262.
Reprinted in *Readings in Microeconomic Theory*, Manfredi La Manna Ed., Dryden Press, 1997.
- "Investments in Oligopoly: Welfare Effects and Tests for Predation," *Oxford Economic Papers*, vol. 41 (October 1989): 698-719.
- "Entry Deterrence Externalities and Relative Firm Size," *International Journal of Industrial Organization*, vol. 6 (June 1988): 181-197 (with Michael Baumann).
- "The Competitive Effects of Vertical Agreements: Comment," *American Economic Review*, vol. 77 (December 1987): 1063-1068.

"The Nature and Scope of Contestability Theory," *Oxford Economic Papers*, vol. 38 Supplement (November 1986): 37-57.

This issue of the journal was published in parallel as *Strategic Behavior and Industrial Competition*, Morris et al. Eds., Oxford University Press, 1986.

"The Perverse Effects of the Robinson-Patman Act," *Antitrust Bulletin*, vol. 31 (Fall 1986): 733-757.

"Divisionalization and Entry Deterrence," *Quarterly Journal of Economics*, vol. 101 (May 1986): 307-321 (with Earl Thompson).

"Illinois Brick and the Deterrence of Antitrust Violations," *Hastings Law Journal*, vol. 35 (March 1984): 629-668 (with Gregory Werden).

"Contestable Markets: An Uprising in the Theory of Industry Structure: Comment," *American Economic Review*, vol. 73 (June 1983): 488-490 (with Robert Reynolds).

Monographs, Book Reviews, and Other Publications

"Telecommunications Reform in the United States: Promises and Pitfalls," in Paul J.J. Welfens and George Yarrow, Eds., *Telecommunications and Energy in Systemic Transformation*, Heidelberg and New York: Springer, 1997.

"Protecting Intellectual Property by Excluding Infringing Imports: An Economist's View of Section 337 of the U.S. Tariff Act," *Patent World*, Issue 25 (September 1990): 29-35.

Review Essay of: Jean Tirole, *The Theory of Industrial Organization*, MIT Press, 1988. *Managerial and Decision Economics*, Vol. 11 (May 1990): 131-139.

Book Review of: J. Stiglitz and F. Mathewson eds., *New Developments in the Analysis of Market Structure*, MIT Press, 1988. *Journal of Economic Literature*, Vol. 36 (March 1988): 133-135.

"Vertical Restraints," published in German by *Forschungsinstitut für Wirtschaftsverfassung und Wettbewerb* by E.V. Köln, Heft 5, 1984.

DISCUSSION PAPERS AND WORK IN PROGRESS

"Competition in International Satellite Services: Wither INTELSAT Restructuring?" November 1997.

"Competitive Concerns with Gaming of the International Settlements Process under Asymmetric Liberalization of International Telecommunications and Above-Cost Settlement Rates," Affidavit submitted on behalf of AT&T to FCC, in proceedings on *Rules and Policies on Foreign Participation in the U.S. Telecommunications Market*, November 18, 1997.

The 'Open Local Market Standard' for Authorizing BOC InterLATA Entry: Reply to BOC Criticisms," Supplemental Affidavit submitted on behalf of U.S. DOJ to FCC, along with DOJ's evaluation of following BOC application(s): BellSouth in South Carolina, November 4, 1997.

"Competitive Implications of Bell Operating Company Entry into Long-Distance Telecommunications Services," Affidavit submitted on behalf of U.S. Department of Justice (DOJ) to FCC, along with DOJ's evaluations of following BOC applications: SBC in Oklahoma,

May 16, 1997; Ameritech in Michigan, June 25, 1997; and BellSouth in South Carolina, November 4, 1997. Available on the Internet at: www.usdoj.gov/atr/statements/Affiw60.htm

"Towards Competition in International Satellite Services: Rethinking the Role of INTELSAT," paper distributed at OECD Ad Hoc Meeting of Experts on Competition in Satellite Services, Paris, June 1995 (with Joseph E. Stiglitz and Eric Wolff).

"Competitive Markets in Generation: Economic Theory and Public Policy," paper presented at conference on "Electric Utility Restructuring: Whither Competition?" organized by International Association for Energy Economics Los Angeles Chapter, and Micronomics Inc., Los Angeles, May 1995.

"Exclusive Dealing for Rent Extraction," mimeo, January 1994 (with Serge Moresi and Francis O'Toole).

"Option Values of Deposit Insurance and Market Values of Net Worth: Some Evidence for U.S. Banks," mimeo, December, 1992 (with Behzad Diba and Chia-Hsiang Guo).

"Do Sunk Costs Discourage or Encourage Collusion?" U.S. Department of Justice, Antitrust Division, EPO Discussion Paper 85-10 (September 1985).

"Signalling Equilibria Based on Sensible Beliefs: Limit Pricing Under Incomplete Information," U.S. Department of Justice, Antitrust Division, EPO Discussion Paper 84-4 (May 1984) (with Maxim Engers).

OTHER SCHOLARLY ACTIVITIES

Seminars Presented

Bellcore
Bureau of Competition Policy, Industry Canada
California State University, Hayward
Columbia University
ENSAE, Paris
Federal Trade Commission
Georgetown University
George Washington University
International Trade Commission
Johns Hopkins University
New York University
Pennsylvania State University
Simon Fraser University
Tulane University
U.S. Department of Justice
University of Alberta
University of British Columbia
University of Calgary
University of California, Davis
University of California, Los Angeles
University of Maryland
University of Montreal
University of Pennsylvania
University of Toronto

University of Virginia

Conferences: Speaker or Discussant

25th Annual Telecommunications Policy Research Conference, Washington DC, September 1997.
Telecommunications seminar series, Canadian Bureau of Competition, Ottawa, September 1997
Competition Policy Workshop, The World Bank, June 1997.
Economics of Interconnection Forum, Federal Communications Commission, Washington DC, May 1996
Authors' Symposium on Competition Policy and Intellectual Property Rights, Canadian Bureau of Competition, Aylmer, Quebec, May 1996
Electric Generation Association, Annual Meetings, West Palm Beach, April 1996
"Wheeling & Dealing: Opportunities and Challenges in the New Electric Industry," conference sponsored by the Center for Regulatory Studies, Illinois State University and the Institute of Government and Public Affairs, University of Illinois-Urbana, Chicago, April 1996
"New Social and Economic Approaches to a Multimedia World," OECD Symposium, Tokyo, March 1996
"Telecommunications and Energy Regulation in Transition Economies," Center for Economic Development, Bratislava, October 1995
"Electric Utility Restructuring: Whither Competition?" organized by International Association for Energy Economics Los Angeles Chapter, and Micronomics Inc., Los Angeles, May 1995.
"New Learning on Barriers to Entry in Competition Policy," Canadian Bureau of Competition, Ottawa, March 1995
Southeastern Economic Theory Meetings, Charlottesville, October 1994
EARIE Conference, Tel Aviv, September 1993
Midwest International Economics Meetings, Pittsburgh, October 1992
Latin American Econometric Society, Mexico City, September 1992
Conference on Industrial Organization, Carleton University, Ottawa, July 1991
Workshop on Strategic and Dynamic Aspects of International Trade, SUNY at Stony Brook, July 1991
AEI Conference on "Innovation, Intellectual Property and World Competition," Washington DC, September 1990
EARIE Conference, Lisbon, September 1990
Conference on "International Trade and Technology," Brussels and London, November 1989
EARIE Conference, Budapest, August 1989
Conference on Strategy and Market Structure, Dundee University, Dundee, August 1988
Conference on "Firm Ownership and Competition," Graduate School of Business, Stanford University, June 1987
EARIE Conference, Berlin, August 1986
AEA Annual Meetings, Dallas, December 1984

Referee for Professional Journals

American Economic Review
Canadian Journal of Economics
Economica
Economic Journal
International Economic Review
International Journal of Industrial Organization
Journal of Business
Journal of Business Economics
Journal of Economic Dynamics and Control
Journal of Economic Theory
Journal of Economics and Management Strategy

Journal of Industrial Economics
Journal of Political Economy
Managerial and Decision Economics
Quarterly Journal of Economics
Quarterly Review of Economics and Business
RAND Journal of Economics
Review of Industrial Organization
Review of International Economics
Scandinavian Journal of Economics

Outside Evaluator—Research Proposals and Tenure & Promotion Cases

National Science Foundation

Small Business Administration

Several economics departments (identities disclosed on request)

