



TELEPHONY, THE INTERNET, AND THE MEDIA

*Selected Papers from the
1997 Telecommunications
Policy Research Conference*

Edited by

Jeffrey K. MacKie-Mason
David Waterman



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Contents

Authors	vii
Acknowledgments	ix
Preface <i>Jeffrey K. MacKie-Mason</i>	xi
Introduction <i>Jeffrey K. MacKie-Mason and David Waterman</i>	xiii
I Historical	
1. A Novel Conference: The Origins of TPRC <i>Bruce M. Owen</i>	1
II Telephony	
2. A Technico-Economic Methodology for the Analysis of Local Telephone Markets <i>Farid Gasmi, Jean-Jacques Laffont, and William W. Sharkey</i>	15
3. Firm Interaction and the Expected Price for Access <i>Judith A. Molka-Danielsen and Martin B. H. Weiss</i>	37
4. The Implications of By-Pass for Traditional International Interconnection <i>Douglas Galbi</i>	53
5. Call-Back and the Proportionate Return Rule: Who Are the Winners and Losers? <i>Mark Scanlan</i>	69
III The Media	
6. Video Competition and the Public Interest Debate <i>Howard A. Shelanski</i>	91

7. Lessons from Oz: Quantitative Guidelines for Children's Educational Television <i>Angela J. Campbell</i>	111
8. AM Stereo and the "Marketplace" Decision <i>David W. Sosa</i>	129
IV The Internet	
9. A Taxonomy of Internet Telephony Applications <i>David D. Clark</i>	157
10. Internet Telephony: Costs, Pricing, and Policy <i>Lee W. McKnight and Brett A. Leida</i>	177
11. Muddy Rules for Cyberspace <i>Dan L. Burk</i>	197
12. Designing a Social Protocol: Lessons Learned From the Platform for Privacy Preferences Project <i>Lorrie Faith Cranor and Joseph Reagle, Jr.</i>	215
V Comparative Studies in Telephony and Satellite Policy	
13. The Paradox of Ubiquity: Communication Satellite Policies in Asia <i>Heather E. Hudson</i>	235
14. Participatory Politics and Sectoral Reform: Telecommunications Policy in the New South Africa <i>Robert B. Horwitz</i>	251
15. Telecom Competition in Canada and the United States: The Tortoise and the Hare <i>Willie Grieve and Stanford L. Levin</i>	269
Author Index	287
Subject Index	291

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Acknowledgments

The Telecommunications Policy Research Conference (TPRC) has now run for 25 years. Throughout this history, many of the papers presented have resulted in journal articles and other publications. For most of the years, there was not a regular proceedings publication.

In 1994, the combined efforts of Christopher H. Sterling, the series editor of the Lawrence Erlbaum Associates Telecommunications Series, Hollis Heimbouch of LEA, and TPRC Board members John Haring, Bridger Mitchell, and Jerry Brock, resulted in a new arrangement for LEA to publish a series of selected papers from the annual TPRC. This is the fourth volume in the LEA series, and it contains papers selected from the 25th annual conference, held in September 1997.

We greatly appreciate the assistance we received in dealing with the difficult task of selecting papers for this volume. We consulted with the TPRC organizing committee, session chairs and discussants, and various others who volunteered their time to referee. There were over 70 papers presented at the conference, and there were many outstanding contributions that we regret we could not include due to space limitations.

We have worked to fulfill our promise to deliver a published text in time for the 26th annual conference. We could not have done this without superb production work. We thank Cyndi Connelley, Roxie Glaze, and Jennifer Sterling for their expert copyediting entry and typesetting work. We are especially grateful to Linda Bathgate, Barbara Wieghaus, and their colleagues at LEA for guiding the production of this book to its conclusion.

We owe special thanks to the John R. and Mary Markle Foundation. Without its long running grant support, the 25th annual TPRC would not have been possible. In addition, the 25th TPRC had the benefit of a generous matching grant from the W. K. Kellogg Foundation. AT&T, Bell Atlantic, the Benton Foundation, and Cablevision Systems Development Corporation also made generous donations to the 1997 TPRC.

Jeffrey K. MacKie-Mason
David Waterman

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Preface

My, what a long strange trip it's been! The first Telecommunications Policy Research Conference was held in 1972. In 1997 we celebrated the 25th annual conference. The attendees were an impressive group, but I hazard a guess that few of them would have forecast that in 25 years we would be watching AT&T struggle to get *back into* local telephony! Of course, *plus ça change, plus la même chose*, as Bruce Owen reminds us in his retrospective essay. Still, it is hard to imagine anyone involved in telecom policy over the last two and a half decades who does not find the experience just a bit astonishing.

It is conventional for a conference organizer to express gratitude for the opportunity. In this instance, my gratitude for the honor of being selected as the Organizing Chair of the 25th TPRC is genuine and deep. TPRC is a venerable institution (especially counted in Internet years). Along with telecommunications policy, it has grown and changed in unexpected ways. I'm sure the parents shook their heads with some puzzlement as the teenager grew into an adult. But one of the especially gratifying events this year was to gather some of those parents for the opening plenary, and to see the persistence and success of their original vision. We had a gathering of three or four generations of telecom policy family this year. As with any extended family, there were some disagreements. Nonetheless, I think we almost universally share an appreciation for this community of scholars, policy-makers, and practitioners who are joined by a shared interest in telecom policy, despite widely ranging academic fields and organizational interests. I thank past conference organizers for inviting me to participate, and I thank last year's Board of Directors for honoring me with the Chairship.

Being chair was also (usually!) a delight. For this I must thank the members of the Organizing Committee: Jorge Schement of the Pennsylvania State University (and the Program Chair for the 26th Annual Conference); Paul Resnick of the University of Michigan; Jessica Litman of the Wayne State School of Law; Ben Compaine of the Pennsylvania State University; Heather Hudson of the University of

California, San Francisco; Evan Kwerel of the Federal Communications Commission; Nicholas Economides of New York University; Jean-Paul Simon of France Telecom. This team managed the challenging issues of forming a program for a conference that becomes more diverse each year. They bore with grace and generosity the burdens imposed by a significant increase in the size of the program to celebrate the 25th annual conference. The Committee also debated and implemented some significant policy changes, notably the requirement that completed papers be received before the conference begins. On the awkward task of enforcing this policy and on other difficult decisions, the Committee always reached consensus and acted with respect for authors combined with commitment to the success of the conference as a whole.

On behalf of the Committee, we would like to thank the nearly 200 scholars who submitted abstracts and papers in response to the conference call. Submissions increased by about 30% over the previous year. The most important determinant of conference quality is, of course, the quality of the papers presented. We were sad that we could not include every good paper, but we were pleased to encounter this problem.

On behalf of everyone participating in the conference, I want to offer heartfelt appreciation for the tremendous effort by Dawn Higgins and Lori Rodriguez, the conference administrators. It is clear to me each year that participants value Dawn and Lori; it is even more clear to me now that participants don't know the half of it. In addition, we are all grateful for the largely unheralded work by the Board of Directors, and especially Pam Samuelson and Eli Noam, who co-chaired last year's Board. The Board takes responsibility for financing the follies of the Organizing Committee; it also handles all of the difficult policy questions. Indeed, I made sure that the name of the Organizing Committee was changed to the Program Committee for the future because most of the important organizing work is done by Dawn, Lori, and the Board; the (now) Program Committee is largely left to focus on the fun part: putting together a first-rate program. For this we are grateful.

Let me close by thanking the authors of the papers selected for this volume. The selection was difficult: We chose 15 papers from among nearly 70 presented at the conference. The authors responded quickly and gracefully to the comments that David and I provided. On a personal note, I wish to thank David for his leadership in the editing of this volume. David played parent to my irresponsible child; he guided our selection of papers and preparation of introductory materials with a wise hand, and he did all this with good cheer. Now, we hope you, the reader, enjoy this collection of current, high-quality telecom policy research. And we look forward to seeing you at future TPRCs.

—Jeffrey MacKie-Mason

Introduction

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With our title, *Telephony, the Internet, and the Media*, we intend to reflect the diversity of the Telecommunications Policy Research Conference. We also have more substantive reasons to group papers involving these seemingly different industries under the same roof.

One reason is the increasing difficulty of considering the policy problems of one communications industry in isolation from the others. Thirty years ago, probably the most significant relationship between telephony and the media was the cable industry's need for access to telephone poles to hang coaxial cable. Today, telephone companies and cable companies increasingly are offering each other's services to consumers, creating a maze of policy dilemmas that in the United States culminated in the Telecommunications Act of 1996. With the exceedingly fast growth of the Internet, from essentially nothing only 5 years ago, a third "industry" has complicated communications policy still further. On the input side, the Internet uses both telephone and cable facilities. The Internet's outputs include new communication forms that sometimes substitute for, sometimes complement traditional telephone service and media programs. Radio, newspapers, voice telephony, and streaming video all are found in various stages of maturity on the Internet. It is not reaching to say that no longer can any telecommunications policy be limited strictly to a single communications medium.

A second reason to combine papers on various communications industries is the opportunity to learn common policy lessons. Most communications industries share fundamental economic characteristics, such as strong economies of scale with respect to the number of consumers, and common social concerns, such as freedom of speech and privacy issues. As the chapters in this volume indicate, these common concerns are especially important for Internet research. Internet content control, standard setting, and network interconnection pricing, for example, parallel the same issues in the media or telephony. If policy learning for the Internet is to progress in the same blindingly fast "Internet years" that the medium itself is growing, it will be important to learn from experience in the media and telephony.

The remarkable pace of change that is merging the technological, economic, and policy issues in communications has continued unabated in the year since the last edition of the TPRC Selected Papers volume. There is no shortage of subject matter for TPRC authors! In the United States, implementation of the Telecommunications Act of 1996 has continued to unfold. Some effects of the Communications Decency Act are emerging slowly, partly due to still-pending legal challenges to provisions for local telephone company entry into long distance service, and to the pending Supreme Court case on the FCC interconnection rules. The debate on Internet content control was highlighted by the Supreme Court nullification of the Act's content "decency" provisions. In major developments, the FCC implemented telephony access charge reform and issued rules to implement universal access reform. Notable in the latter rules was the convergence between telephony and Internet policy: A nonprofit corporation was formed to establish universal Internet access through schools and libraries. In addition, most states have been adjusting their policies to conform to the new federal law.

1997 was a big year for international policy. The World Trade Organization reached a major agreement on telecommunications competition, in which 69 countries, representing over 90% of world telecommunications activity, agreed on a framework for far-reaching liberalization. Some of the consequences are discussed in this book. There was also a major international debate about the governance of the Internet, with a focus on the ownership and allocation of property rights in Internet address names. An ad hoc international management authority was established, but it remains to be seen whether it will be considered authoritative.

Despite the heavy attention to telephony and the Internet over the past couple of years, major developments continued in media policy. Notable in the United States were the promulgation of new guidelines for children's broadcast television, and mandated standards for a V-chip (a hardware device that allows parents to block access to programs carrying certain labels). The FCC also finalized its rules for allocating digital TV bandwidth to existing broadcasters, with a provision for auctioning reclaimed analog bandwidth in 10 years.

The telecom industries were busy while domestic and international policies were being revised. MCI agreed to be purchased by Worldcom for \$30 billion in

the largest U.S. deal ever. This deal would combine the second and fourth largest U.S. long distance providers, and two of the leading Internet providers. SBC and Pacific Telesis completed their \$16.5 billion merger in April; Bell Atlantic and NYNEX completed their \$25.6 billion merger in August. New alliances among various national monopoly carriers were announced, in part anticipating the opening of cross-border telecom competition in the European Union.

With the continuing convergence and interaction between traditionally separate telecom industries, it is not easy to segment our 15 selected papers from the 1997 TPRC into well-defined categories. To assist the reader, we have organized the book into 5 parts. Part I is labeled Historical, a category that is special to the 25th anniversary edition of the TPRC. Part II, Telephony, Part III, The Media, and Part IV, The Internet, follow, and we conclude with Part V, Comparative Studies in Telephony and Satellite Policy. Readers will notice repeated themes and cross-connections between the chapters in these sections.

I. HISTORICAL

Bruce Owen, in "A Novel Conference: The Origins of TPRC" (Chapter 1), sets the context by reviewing the TPRC's 25 year history and its contributions to telecommunications research and policy making. Owen describes the Washington in which the first conference was held in 1972, under auspices of the old Office of Telecommunications Policy, as a "lonely and inhospitable place" to the academically minded in telecommunications. In making its journey from that 15-presenter meeting held at the old Executive Building, to the far larger present-day conference, the TPRC has left a substantial wake.

In reviewing the TPRC's contributions, Owen cites both its "inputs," an extraordinary increase—from virtually zero—in the number of economists and other professionals employed by the FCC and other Washington agencies involved with communications policy, and its "outputs," the TPRC's role in the revolutionary reforms in telecommunications regulation. The FCC, he notes, now routinely considers economic welfare effects in its deliberations, and a whole new accompanying set of arguments frame the Washington debate on telecommunications policy. The unique contribution of the TPRC, Owen notes in conclusion, is the "invisible college" of communication researchers throughout the world that collaborate and deliver relevant policy analysis to government agencies.

II. TELEPHONY

Recent U.S. telecom policy discussion has been dominated by the Telecommunications Act of 1996. This sweeping legislation was both a reaction to the major transformations in telecom technology and markets, and a (partial) roadmap to the

future competitive landscape. Within this context, we have four chapters devoted to current issues in telephony. The first two concern regulation and competition in local service, whereas the next pair examine regulatory arbitrage pressures on international phone traffic.

In "A Technico-Economic Methodology for the Analysis of Local Telephone Markets" (Chapter 2), Farid Gasmi, Jean-Jacques Laffont, and William Sharkey develop a framework for modeling regulation that combines forward-looking cost analysis with the modern theory of regulation under asymmetric information. The authors present both method and results in an approach that combines an engineering process model of telecommunications service costs with an economic model of regulation and competition.

Gasmi et al. use their model to examine several long-standing issues in telecom regulation. In one such analysis they find that despite the problem of private information not directly available to regulators, the deviation between first-best and optimal regulated prices need not be large. They also find that the optimal regulatory prices can be well approximated through reasonably simple linear pricing rules. The authors then apply the method to a comparison of alternative regulatory approaches. They present many interesting results, including support for the superior performance of price cap regulation.

Local service regulation in the United States and elsewhere must increasingly accommodate facilities-based competition. In the United Kingdom, for example, most customers already have a choice between at least two providers. In the United States most wireline competition thus far has been through reselling (although wireless competition has been strong for over a decade), but cable providers and other overlay builders are preparing to offer competitive service.

Judith Molka-Danielsen and Martin Weiss, authors of "Firm Interaction and the Expected Price for Access" (Chapter 3), use a model related to that of Gasmi et al. to assess the effects of local competition on access pricing and universal service. They model duopoly pricing between two firms with no subsidy for universal service. Molka-Danielsen and Weiss then calibrate their cost and demand functions to proprietary data from multiple service areas. Without the cross-subsidy, penetration rates fall. The authors characterize the sensitivity of access prices and penetration to cost and demand conditions, as well as to the nature of strategic interaction between the two firms. One general conclusion is that fixed costs are sufficiently high that Bertrand (marginal cost pricing) equilibria are unlikely with only two facilities-based competitors.

The next two chapters examine consequences of the ad hoc system of accounting-based international "settlement" rates in a world where domestic deregulation and technological advance foster competitive adaptation. When regulatory price structures do not reflect cost or efficient bargaining outcomes, innovative service providers will seek ways to capture some of the regulatory inefficiency rents left on the table. In both of these chapters, we see that the market pressures leading to

domestic telecom regulation reform throughout the world over the past two decades are now squarely challenging the framework of transnational regulation.

Douglas Galbi studies the consequences of regulatory by-pass opportunities in "The Implications of By-Pass for Traditional International Interconnection" (Chapter 4). International voice transit is treated as a jointly provided service in most bilateral treaties, and the revenues are shared according to a fixed, arbitrary rule. Because the revenue share may be above or below a competitive return on service, countries with multiple international providers, such as the United States, also have rules specifying the sharing of traffic volume among competing providers. However, following increased liberalization of domestic competition, unregulated alternative transit will now be permitted by 52 countries through the WTO agreement. Other by-pass opportunities also exist. Galbi models the pricing and traffic volume strategies for competing carriers who can choose between settlements traffic and by-pass. Just as we have seen for domestic by-pass in the United States following AT&T's divestiture, regulated and by-pass traffic can co-exist in equilibrium. However, Galbi shows that by-pass opportunities impose dynamic and complex constraints on the policy effectiveness of internationally regulated rates. It appears unlikely that fixed accounting policies can implement desired policy outcomes in a world of increasingly dynamic and multilateral unregulated competition.

In the final chapter of Part II, Mark Scanlan offers some surprising insights on the consequences of international regulatory arbitrage in "Call-Back and the Proportionate Return Rule" (Chapter 5). Call-back is a scheme to arbitrage artificial differences in international call origination prices. This type of arbitrage does not by-pass international settlement rates; rather, it reroutes calls to take advantage of different termination rates. Suppose that a French-U.S. call is priced higher when it originates in France. A call-back service provides French callers with a special U.S. number to call. The system extracts the originating French number, and originates a circuit from the U.S. side from which the French caller can reach its U.S. party.

Scanlan reports that in 1996, 42 of 66 responding countries had declared call-back services to be illegal. However, he shows that in most countries the provision of a call-back service can increase the profits of the operator in the higher priced country. A key feature of the argument straightforwardly illustrates how ad hoc pricing rules can stand intuition on its head: Because international connection revenues are fixed and split according to formula, it doesn't matter to the operator who originates the call. But if lower end-user prices stimulate demand, the high-cost operator earns a windfall. Together with Galbi's chapter, Scanlan's analysis suggests that the pressures for international rate reform in the wake of domestic reform will be great.

III. THE MEDIA

The first two chapters in this group address content regulation in television. Content regulation will probably always be with us; it certainly continues as a major focus for telecom policy. Although one of the major new stories of the year was the Supreme Court's decision striking down the Communications Decency Act as unconstitutional, content regulation in television is on the upswing after its near total eclipse during the broadcast deregulation era of the 1980s. Pursuant to the 1990 Children's Television Act, FCC license renewal guidelines that require stations to air 3 hours of children's educational television per week took effect in September 1997. Following the 1996 Telecommunications Act, the FCC has now approved the television industry's new program rating system and issued technical rules for installation of V-chips in TV sets. The television content debates have important implications for attempts to regulate Internet competition as well.

Howard Shelanski, in "Video Competition and the Public Interest Debate" (Chapter 6), takes a broad legal and economic perspective on content regulation. His main idea is that the traditional economic "market failure" arguments—spectrum scarcity, a lack of sufficient competition, limited channel capacity, and a lack of direct payment mechanisms—are outmoded and no longer justify government content intervention. After reviewing the history of FCC content regulation since the 1930s, Shelanski argues that explosions in the capacity and competition of video media, including pay television and videocassettes, render these arguments irrelevant. However, the participants in current content regulation debates, such as those involving children's television, continue to rely on the traditional arguments.

Shelanski then points out that broadcast content regulations, although they cannot be justified in economic terms, might be justified in terms such as whether parental preferences can and should replace those of children because the children are not equipped to be gatekeepers. He makes the case that this and other noneconomic arguments should be "unbundled" from the no longer appropriate arguments that regulation is needed to enhance program diversity or remedy gaps due to economic inefficiency in privately supplied programming.

Angela Campbell, in "Lessons from Oz: Quantitative Guidelines for Children's Educational Television" (Chapter 7), turns to the specific issue of whether the FCC's children's television guidelines are likely to work, and how they might be improved. She does so by examining Australia's long experience with a children's television quota. That experience, she argues, suggests that quantitative guidelines can lead to an increase in the quantity of children's educational programming. The Australian experience, however, has demonstrated the tendency for broadcasters to exaggerate the quantity, quality, or educational content of programming that is nominally intended for children. Australia has addressed these problems by determining in advance of a program's airing whether it meets the criteria for children's programming. Because the FCC, pursuant to the CTA, leaves the determination of

whether programs meet its criteria to broadcasters subject to challenges by the public, it may be more difficult in the United States to assure that only programming meeting the definition is counted toward the guideline.

Campbell concludes with some recommendations for achieving the goals of the CTA. She argues that the Australian system in which the government preclassifies programs in advance would probably prove unconstitutional in U.S. courts. Nonetheless, she recommends that the FCC consider providing a more helpful definition of “educational,” and like the Australian government, examine whether sufficient resources for program production are available and whether resulting production values are equivalent. The FCC should also, she recommends, review the efforts of licensees on an annual basis.

The final chapter in Part III is concerned with an issue of increasing importance: standard setting. David Sosa, in “AM Stereo and the ‘Marketplace’ Decision” (Chapter 8), challenges the widespread assumption that the FCC’s decision not to set an AM stereo standard in the early 1980s prevented AM stereo from becoming economically viable. The usual argument has been that uncertainty about a standard discouraged consumers from purchasing enough sets to realize a critical mass.

Sosa presents a statistical analysis of AM stereo adoption in three major markets in which AM stereo reached substantial penetration between the late 1970s and the mid-1990s. He tests the hypothesis that audience ratings of stations that adopted stereo radio broadcasting were significantly higher than stations that did not adopt. In only one of the three markets did results suggest that stereo diffusion had any effect on audience behavior. Although Sosa’s results are somewhat ambiguous, his analysis does fail, in any of the three cases, to support the conventional wisdom—that market failure was the cause. Sosa cautions against interpreting the AM stereo experience as a government failure; low consumer valuation for this change in audio quality may tell a richer story about the failure of AM stereo adoption.

IV. THE INTERNET

In Part IV, the authors of Chapters 9 and 10 deal directly with an obvious nexus of telecom policy interest: Internet telephony. The development of technology for full-duplex phone calls over the Internet brings to the fore the rapid transformation of telephony from natural monopoly to naturally competitive industry. We now see local and long distance telephony provided by traditional operators, Internet-based operators, and cable operators (e.g., in England).

In “A Taxonomy of Internet Telephony Applications” (Chapter 9), David Clark provides a much-needed characterization of Internet telephony (IPTel). IPTel is not a single physical technology, nor is it a single service offering. Ignorance about the different technologies and possible services (nearly all of them are still conjectural) causes a great deal of confusion in the trade press and current policy discus-

sions. For example, as Clark points out, the most immediately feasible service is his Class 1, which is long distance or international calling using existing local loops, but replacing long distance or international circuits with Internet links. Although there are three reasons why this might be a cost-effective alternative, the important reason is that it can operate as a form of long-distance access charge bypass (or settlements bypass for international calls; cf. the chapters by Galbi and Scanlan). This is simply a form of regulatory arbitrage, much as we saw local-loop bypass operators perform regulatory arbitrage during the initial post-divestiture years. Fixing the regulatory inequity will leave Class 1 IPTel as a lower quality, costly-to-install alternative to traditional circuit-switched telephony.

Understanding what IPTel can do, and the role of regulatory arbitrage, is important. For example, fueled by press releases heralding massive IPTel investments by companies like Qwest and Delta3, some congressional leaders are pushing the FCC to revise the Universal Service Fund contribution rules before IPTel overwhelms traditional telephony. Clark does not address whether fixing an access charge arbitrage opportunity by changing the universal service funding base is a wise regulatory approach. Rather, he provides an extremely lucid and forward-looking characterization of IPTel necessary to address such policy questions. He illustrates this by closing with a few high-level policy implications that follow from an understanding of IPTel.

Lee McKnight and Brett Leida are Clark's colleagues at MIT; all three participate in MIT's Internet Telephony Consortium. In "Internet Telephony: Costs, Pricing, and Policy" (Chapter 10), McKnight and Leida provide a detailed economic-engineering study of advanced IPTel service (Clark's Class 3 type). This service involves end-to-end Internet communication, with the phone handset attached to the user's computer. The public switched telephony network handles no component of the voice call, although the authors assume Internet connections are obtained by dial-in service over the local switched network. New capabilities can be provided to users because communications are intermediated by powerful end-node computers. McKnight and Leida find that moderate use of computer-to-computer Internet telephony can increase the costs of an Internet service provider by as much as 50%.

Current hype about Internet telephony may make it seem surprising that IPTel can raise costs by so much. But Internet technology is based on sharing ("statistical multiplexing" is the fundamental characteristic). IPTel is not particularly well suited for sharing: it has been shown elsewhere that the ratio of bursts to average data flow is only about 2-to-1, which means that after overhead and quality control buffering, the efficiency gain from sharing cannot be much more than 1-to-1 (no sharing). Consequently, the authors estimate that holding times and call arrival rates will each increase by 20% in their main scenario. Further, customer service and billing costs tend to rise directly with new services. Thus, offering substantial IPTel service would require new capital and personnel investments. ISPs could not sustain this cost increase based on current levels of flat rate pricing. The authors

believe that usage-sensitive pricing would become necessary before IPTel could commercially succeed. With these costs and the need for more revenue, it does not appear that IPTel will offer consumers large cost savings: Rather, as Clark emphasized, the main advantage of Class 3 IPTel is likely to be the value of new functionality offered to consumers through integration with an end-node computer.

In Chapter 11, "Muddy Rules for Cyberspace," Dan Burk is concerned with the evolution of intellectual property rights as digital networked distribution becomes easy and ubiquitous. Debates about intellectual property rights and digital copyright have become telecom policy issues because of the modern concern about obtaining a return for an author when digital works can be almost costlessly reproduced and distributed.

Burk points out that a critical working assumption implicit in many discussions of the copyright issue is largely incorrect: that the received wisdom embraces strong or complete property rights as the ideal. He shows that in fact rights for tangible property are often "muddy;" that is, there is ambiguity about certain claims to use property that can only be resolved through a subjective balancing test. Burk then argues that the nature of intellectual property makes muddy rules especially appropriate for certain types of use; fair use rules in copyright law are a long-standing tradition in this regard. Interestingly, Burk discusses a number of ways in which transaction costs will be higher for telecom-intermediated uses of intellectual property. This contrasts with another common preconception: that digital communications networks uniformly reduce transactions costs for commerce and exchange. In the end, Burk argues against a single "clear" rule for intellectual property in cyberspace, proposing instead that good legal rules should be as varied—and in some cases as muddy—as they are in real space.

The authors of Chapter 12 describe the interaction between engineering and sociopolitical considerations when designing a system for describing and managing privacy rights on the Internet. In "Designing a Social Protocol: Lessons Learned from the Platform for Privacy Preferences Project," Lorrie Faith Cranor and Joseph Reagle, Jr. offer an insightful case study of socio-engineering design for the Internet, as well as constructive lessons on the problem of unintended consequences. Cranor and Reagle's chapter is ostensibly about Internet concerns, but, like Burk's chapter, it in fact deals with problems that are common to policy for all communications media.

The authors have been leading participants in the collaborative project to develop a system for expressing privacy preferences on the Internet and automatically negotiating the use of personal information. For example, current technology allows Web site owners to "set a cookie" or store an identifier on a user's hard drive, which can be checked during later visits or as the user moves across the Internet to track usage and activity.¹ The proposed P3P protocol would

1. Most browsers can be configured to prevent cookies from being stored, but this requires some sophistication on the part of users, and makes some sites virtually unusable.

allow users to store a set of preferences specifying which types of personal information may be used for what purpose and by whom. Although the goal seems sensible, the authors clearly describe how difficult implementation can be. Along the way they show how a poorly designed communications technology can have unintended, often adverse consequences. This point is not new, of course, but Cranor and Reagle use their experience from designing P3P to constructively suggest principles for "social protocol" design that can help avoid problems. Notably, they emphasize the goal of "mechanism not policy," and then illustrate this sound principle through a series of concrete examples. One very useful lesson for policymakers is the importance of trying to distinguish between technology design decisions and policy choices.

V. COMPARATIVE STUDIES IN TELEPHONY AND SATELLITE POLICY

Learning from experience around the world has always been a strong tradition at the TPRC. We include three chapters in which the authors examine satellite policy in the Asia-Pacific region, telecommunications reform in South Africa, and differences in recent telecommunications reform between the United States and Canada.

Chapter 13, "The Paradox of Ubiquity: Communications Satellite Policies in Asia," by Heather Hudson, is critical of what she describes as politically driven satellite policies in the Asia-Pacific Region. Along with a proliferation of regional and international satellites serving the region, seven individual countries, some of them very small, now have their own satellites, four of them launched since 1993, with at least one other planned.

Hudson questions the need for these satellites, and suggests that interaction between the "national flag carrier syndrome" and liberal ITU policies for granting slots to individual countries is responsible. Hudson finds that while lip service is paid to universal service and other social objectives, in reality slots in some smaller countries have been turned over to private investors in exchange for negotiated compensation, to the neglect of social goals. Hudson concludes with recommendations on satellite policy: countries need to create incentives for investment in the terrestrial networks that will interconnect with satellite transmissions; countries need a regulatory structure in place, and agreements for interconnection with terrestrial networks; and that user needs must be accounted for more directly. These policies will at least ensure, she predicts, that the satellites will be used as effectively as possible.

Robert Horwitz's contribution, "Participatory Politics and Sectoral Reform: Telecommunications Policy in the New South Africa," (Chapter 14), tells an unusual story. We read harsh critiques about reform efforts in various countries that have stagnated or degenerated into self-interested rent seeking. In contrast, Horwitz praises the South African process of telecom reform as a politically legitimate, innovative process of consensus building among stakeholders. As a

consequence, rather than being pushed aside by private interests, questions of redistribution—notably universal service and the “general public interest”—remained on the front burner.

South African reform began in 1991 with the creation of a Telkom, a state-owned telecommunications monopoly, through splitting up a classic PTT. Real change began with establishment of the National Telecommunications Forum (NTF), a public participatory process modeled after other South African reform initiatives coinciding with the dismantling of apartheid following the 1994 elections. Negotiations in the NTF between the main stakeholders—Telkom, labor, and business interests—resulted in draft legislation specifying a 3-to-5-year period of exclusivity for Telkom over basic switched telecommunications services, together with provisions for interconnection, free entry into long distance and other services, and a reformed universal service fund among other provisions. To be sure, Horwitz notes, the process had its faults. The draft bill was seriously compromised in a ministerial review, and attention to universal service was sometimes more rhetorical than substantive. And, we should not forget that implementation of the South African reforms has yet to be accomplished. Overall, though, Horwitz describes the reform process leading to the legislation as a model process: “technically viable and for the most part, politically legitimate.”

The final chapter in Part V is also a study complimentary to one country’s recent telecommunications regulatory reform. Willie Grieve and Stanford Levin, in “Telecom Competition in Canada and the United States: The Tortoise and the Hare” (Chapter 15), give high marks to the Canadian reform process leading up to a May 1997 ruling that established rules for local telephone service competition. They argue that the rules will lead expeditiously to true facilities-based competition at the local level. The United States is likened to the hare for getting off to a much quicker start than the Canadian tortoise, but stopping before the process was complete.

Grieve and Levin believe the U.S. Telecommunications Act of 1996 has created a “shade tree” which “may actually entrench monopoly and market power in the local networks of the incumbent local carriers.” The authors focus on the different approaches to unbundling and resale taken in the two largely parallel reform movements. Both the Canadian and U.S. reforms are comparable in their requirements for interconnection of incumbent networks with those of entrants. Grieve and Levin argue, however, that the American legislation mandates excessive unbundling, and sets unrealistically low prices for resale of unbundled network elements by not requiring a sufficient contribution to an incumbent’s fixed costs. The Canadian reform, on the other hand, limits unbundling and resale requirements to only the “essential facilities” of incumbents. The result, the authors claim, is that market entrants in the United States have inadequate incentives to engage in true facilities-based competition, and will simply continue repurchasing and reselling elements of the incumbent’s networks without providing true competition for

them. In Canada, they believe, the law encourages entrants to construct competing facilities, which many analysts agree must be the basis for true local telecommunications competition.

THE EDITORS

This book was edited while David Waterman was Associate Professor in the Department of Telecommunications at Indiana University, Bloomington, and Jeff MacKie-Mason was Associate Professor of Economics, Information and Public Policy in the Department of Economics, and in the School of Information at the University of Michigan, Ann Arbor.

HISTORICAL

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A Novel Conference: The Origins of TPRC

Bruce M. Owen

Economists Incorporated

The 25th annual Telecommunications Policy Research Conference (TPRC) provides an opportunity to reflect on the origins and achievements of TPRC. An objective of TPRC has been to provide not merely a forum for communication policy researchers to exchange ideas, but also a channel for policy-relevant research to reach regulators and other government officials, and for the latter to convey their research needs to academics. Therefore, any discussion of the history of TPRC should be placed in the context of evolving government policy.

TPRC arose, not coincidentally, at the beginning of an extraordinary period in the history of telecommunications policy and regulation. Before the early 1970s, for example, it was unlawful for anyone but AT&T to offer public long distance service; there was no domestic satellite industry; it was unlawful for cable systems to import any but a limited number of distant signals; it was unlawful for any broadcaster or cable operator to offer pay-TV service consisting of entertainment series, sports events that had been on TV in the last 4 years, or movies less than 2 or more than 4 years old; and it was unlawful for customers to attach a “foreign” (i.e., any) device to the telephone network. More generally, it was the mainstream view that the telephone business was and ought to be a regulated monopoly, and that broadcasters were and ought to be protected from excessive competition in order to promote their ability to offer public service and especially local programming.

Further, and even more generally, the 1970s was a unique period in U.S. economic history; one in which the validity of the notion of natural monopoly and the virtues of regulation came into question. During these years academic skepticism or even cynicism about regulation, emanating especially from the Chicago School, spilled over into public debate. The result was not just communication policy reform but intercity bus, airline, trucking, and railroad deregulation; the beginnings of related reforms in the securities and financial services industries; and other deregulation initiatives. A dramatic change illustrative of the growing currency of

economics took place at the Department of Justice Antitrust Division, which today employs four or five dozen Ph.D. economists. Before 1974 the Antitrust Division had no permanent staff of such economists. Similar changes occurred at the Federal Trade Commission (FTC). Many other countries have followed the U.S. intellectual lead in these matters, in some cases showing greater courage in implementing regulatory reform.

TPRC arose also during a period of extraordinary growth and change in telecommunications technology. Remote terminals of mainframe computers, geosynchronous satellites, fiber optic transmission lines, electronic switches, digital transmission and compression, the Internet, and many other advances created pressures for regulatory reform and facilitated reform.

TPRC BEGINNINGS

The institution of TPRC was neither the beginning of academic interest in communications policy nor the first time academics, lawyers, political scientists, engineers, and economists had a direct impact on communications policy. Modern academic interest in communication policy can be traced to Ronald Coase's (1959, 1962) famous property rights papers on spectrum allocation, and to such theoretical work on utility regulation as the well-known Averch and Johnson (1962) paper.

Those unfamiliar with the field will wonder what is meant by "communication" or "telecommunication" in the present context. What is meant, roughly, is those activities historically subject to the jurisdiction of the Federal Communications Commission (FCC). This usage is curious, because telephone regulation has much more in common with electricity or natural gas regulation than with broadcasting. If industry research were focused on firms with basic similarities in their products and technologies, we would have separate conferences on mass media and on public utilities. That the same research community, and even the same individual researchers, focused on the legal jurisdiction rather than the more natural economic classifications illustrates the important influences that government has on policy research.

Although important and relevant research existed, the government appeared to remain ignorant of it until the late 1960s, when Lyndon Johnson convened the President's Task Force on Telecommunications Policy, headed by Undersecretary of State Eugene V. Rostow (President's Task Force, 1968). The Task Force was established in part to hold back a rising sea of political pressure that had begun to lap at the White House gates. The pressure arose from the desire of potential entrants to arbitrage the growing gap between prices and costs or between actual and best-practice technologies, and from those incumbents who relied on government to protect economic rents. These pressures were manifest chiefly in controversies

involving long distance telephone service, domestic communication satellites, and the import of distant TV signals by cable systems.

Rostow assembled a talented staff. For example, Richard A. Posner was seconded from the Justice Department and Walter Hinchman from Commerce. Leland L. Johnson came from RAND. More than 30 academic consultants were retained, including William J. Baumol, William F. Baxter, William Capron, William K. Jones, Charles J. Meyers, Monroe E. Price, and Lester D. Taylor. Government agencies sent representatives, such as Roger G. Noll from the Council of Economic Advisors. The Task Force, its consultants, and its research contractors, well aware of relevant academic research, produced a report that was cautiously progressive, suggesting for example an “open skies” policy for domestic communication satellites, and a greater role for competition in telephony. The staff and contractors also produced several innovative papers on marketable spectrum rights. Finally, the Task Force recommended establishment of an executive branch agency to formulate and coordinate telecommunication policy. More important than the specific recommendations, however, the Task Force implicitly validated the notion that there was such a thing as “telecommunications policy,” that it was susceptible to analytical policy research and analysis, and that there existed a newly self-aware community of scholars interested in such research.

ESTABLISHMENT OF THE OFFICE OF TELECOMMUNICATIONS POLICY

When President Johnson did not run for reelection, his Task Force lost its constituency. Politics notwithstanding, however, the incoming Nixon administration picked up on and sought to implement many of the Task Force recommendations. Clay T. (Tom) Whitehead, a Special Assistant to the President assigned to communication matters, perhaps because he had a doctorate from MIT (in political science), pushed to implement both the satellite open skies policy and the establishment of an executive branch policy agency. The resulting Office of Telecommunication Policy (OTP) was created by Executive Order as part of the Executive Office of the President in 1970. Tom Whitehead became the first director of the agency, reporting at least in theory directly to the president.

OTP inherited the frequency management and emergency preparedness roles formerly exercised by the defunct Office of Telecommunications Management (OTM), along with many of OTM's staff. Whitehead added only a small number of new professional staff. Among them were general counsel (now Justice) Antonin Scalia, and legislative and press relations officer Brian Lamb (later to found C-SPAN). I was the first economist at OTP, initially as a Brookings Economic Policy Fellow, and later as chief economist. Other early OTP economists included Stanley M. Besen, Ronald Braeutigam, and Gary Bowman.

OTP tended to see itself, not indefensibly, as a beacon of reason adjoining an ocean of bureaucratic backwardness. Lacking significant political power (Presi-

dent Nixon and his senior staff did not accord much priority to telecommunications policy even before Watergate), line authority or political experience, Whitehead was reduced chiefly to issuing position papers, making speeches, and writing policy letters to the FCC chairman, which were mostly ignored. This was of course frustrating to those of us aware of the enormous gap between the implications of academic research and the actual state of communications policy in the United States.

THE 1972 CONFERENCE

Several influences led to the convening of the first telecommunications policy research conference. First, it seemed that exposing other policymakers to academic ideas might eventually make them more susceptible to OTP's positions. Second, OTP had a research budget to spend, and a conference appeared to be a sensible use of research funds. Earlier expenditures had sometimes produced embarrassing results, such as studies whose conclusions were at odds with OTP's positions. Third, because academic research appeared to be the major positive factor on OTP's side of most issues, OTP wanted to promote more of it. Giving academics a live audience of policymakers seemed likely to stimulate interest among policy scientists and their students.

Finally, to those of us with academic backgrounds, the Washington telecommunications policy community in the early 1970s was a lonely and inhospitable place. It is not an overstatement to say that ideas like "selling the spectrum" or "breaking up *the* telephone company," or even allowing competition with it, were treated with derision and contempt by responsible officials at all levels. A policy research conference would be good for morale—a booster shot for the OTP staff and the few "enlightened" analysts in other agencies.

The first TPRC was held on November 17 and 18, 1972, in the New Executive Office Building. The audience consisted of federal government employees from OTP, the FCC, and the Departments of Justice, Commerce, and Defense, among others. Papers were presented and discussed by 15 academics (13 economists and 2 lawyers). Among the most luminous academics were Ronald Coase and William Baumol. (The 1972 program is provided in Appendix A.) The research papers were published by OTP (Owen, 1972).

The topics discussed at the first conference are for the most part still on the policy agenda. There were, for example, papers on cross subsidization, financing public broadcasting, spectrum markets, and cable television regulation. There were also papers on subjects that have not been much addressed in subsequent conferences, such as democracy in the newsroom, and one paper analyzing the effect of policy research on FCC decision making. The first conference was regarded as a

success by most of the participants, and there developed a consensus that it would be useful to have an annual conference.

AN ANNUAL EVENT

Although I conceived and organized the 1972 OTP conference, arguably the true beginning of TPRC was at Airlie House on April 16 through 19, 1974. (The program of the 1974 conference appears as an appendix in Owen, 1976.) Although OTP provided partial funding, this was the first independently organized meeting. The 1974 conference was organized by a group of academics (Donald A. Dunn, Stanley M. Besen, Gerald Faulhaber, Leland Johnson, and Ithiel de Sola Pool).

In later years funding came from government agencies such as OTP, the FCC, the National Telecommunications and Information Administration, and the National Science Foundation, as well as from private foundations and programs that either sponsored TPRC directly or funded research that was presented at TPRC. These institutions included the Markle Foundation, the Kettering Foundation, the Sloan Foundation, the Ford Foundation, and the Aspen Institute.

It was the practice of organizing committees in the early years to appoint their successors, with little or no overlap from year to year (organizing committee members through the 1981 conference are listed in Appendix B). Also, it was usual for the organizing committee to include representatives from those few organizations with concentrations of telecommunications policy researchers, such as the RAND Corporation, Bell Labs, and Stanford University. Each organizing committee had to manage funding as well as the program and other administrative arrangements. Because the conference had no permanent home for purposes of funding and administrative services there were frequent difficulties. By the early 1980s many established participants felt that TPRC had drifted away from its original character and goals. Accordingly, in 1987, the conference was reorganized in such a way as to separate program responsibility from fundraising and administrative concerns. Administrative matters were undertaken by a Board of Directors, whose self-perpetuating members have overlapping terms. The Board also has the duty to appoint the annual organizing committee, which has responsibility for the program and local arrangements. Since 1989 Economists Incorporated has provided administrative services to TPRC at cost; in practice this work has been organized by Dawn Higgins.

TPRC is, if not unique, certainly unusual in being a long-running event with no single individual or organization continuing in charge. Conferences like TPRC are more typically organized by learned societies. TPRC has been fortunate in having attracted such a long string of interested and capable organizing committee members. Continuing interest is no doubt also stimulated by the cataclysmic events that have shaken the communication industries since the early 1970s.

TPRC is unique in another respect: the participation of industry researchers. From the beginning, researchers from organizations such as Bell Labs have been an integral part of TPRC. Nevertheless, in the early years there was much debate, which continues, about the participation of industry "lobbyists."

INFLUENCE OF TPRC

It is difficult to say what influences TPRC has had on the development of government policy and on academic policy research because we lack a "control" world with no TPRC. Some of what we are inclined to attribute to TPRC may be due simply to the technological changes that led to revisions in telecommunications industry structure and regulation. However, in celebrating TPRC's 25th anniversary, perhaps we should not demand too much analytical rigor on this point.

One obvious and demonstrable change on the input side is the growth in the number of economists and other professionals with similar training now employed by the FCC and other agencies responsible for telecommunication. In 1970 the FCC had no more than three or four Ph.D. economists; today there are many dozens, and an even greater number are employed by regulated firms and consulting firms. Any given bureau of the FCC today is likely to employ more economists specialized in communications than there were in the nation in 1970. Further, FCC lawyers and other staffers who are not economists have adopted much of the language and many of the precepts of economics.

On the output side, changes have been revolutionary. No important FCC policy statement issues these days without explicit attention to its economic welfare effects. It is true that similar strides have been made in other areas. One is struck, for example, that at the 1997 Tokyo summit meetings on the environment, one of the United States' principal goals was the establishment of tradable emission rights. Nevertheless, communications was undoubtedly the first of the major regulatory fields to be thus reformed, and has progressed the most. TPRC facilitated this in two ways. First, by increasing academic interests in the field, it increased the supply of interested graduate students and relevant dissertations. Second, the private and government lawyers who have always been central participants in the policy process heard at TPRC a whole new set of arguments and principles that transcended the usual motifs of legal argument. Lawyers are always competing to win arguments, and TPRC supplied them with new and more effective ammunition. Further, many academic lawyers became interested in communications policy research, often as part of interdisciplinary teams.

A cynic might say that a great portion of what has changed is that the same old vested interests now feel compelled to make their public interest arguments in terms acceptable to scholars, without necessarily leading to any change in outcomes. However, such cynicism cannot explain how the preexisting industry structure was transformed into entirely new "vested" economic interests, such as