

DIRECTIONS FOR THE NEXT NEW AGE OF TELECOM REGULATION



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Preface

This report is a project of the New Millennium Research Council (NMRC), established in 1999 to foster policy research focused on developing workable, real-world solutions to the issues facing policymakers, primarily in the fields of telecommunications and technology. The Council consists of independent academics and researchers who are experts in their fields. Both seated experts and invited scholars author NMRC reports.

During the past year, the NMRC has investigated a range of issues related to competition in the telecommunications industry. The NMRC has also sponsored a number of roundtable events in Washington, D.C., and legislative briefings on various topics.¹

In this report, the NMRC continues its investigation of telecommunications policy issues by looking forward to the future of telecommunications regulation and examining whether the introduction of new technologies and services will require regulators to shift their current view of regulation to some new paradigm to keep up with the fast-paced technological development in the telecom industry.

This report presents the views of four telecommunications experts – ranging from policy experts to academic experts – who in their own unique voice offer insightful perspectives on the historical view of telecom regulation, the current nature of regulation, and how telecom regulation should proceed in light of technological changes and the introduction of competition.

The report's authors examine previous regulatory models such as regulated monopolies, incentive regulation, and the current regulatory framework to determine whether these models are compatible with a dynamic and ever changing telecommunications industry. The authors also offer perspectives on how regulators can adopt forward-looking regulatory policies that consider the effects of ongoing changes within the telecom industry.

The NMRC publishes this report as the telecommunications industry as a whole weathers a depressed economy and the FCC, in turn, grapples with a host of vexing issues relating to new technologies, competition, broadband, and universal service. Implementation of the Telecommunications Act of 1996 has been a long, drawn out process with numerous twists and turns as the agency's new rules for competition and broadband regulation have been continuously challenged in court, further elongating the process.

The New Millennium Research Council wishes to thank the authors for their contributions and insight on this critical and timely issue.

January 2004

¹ See our web site at www.newmillenniumresearch.org for more information.

Author Biographies

James Alleman is a professor at the College of Engineering and Applied Science, University of Colorado – Boulder. Dr. Alleman spent two years as Visiting Associate Professor in the Media, Communications, and Entertainment Program in the Economics and Finance Division at Columbia Business School, Columbia University, and as Director of Research at Columbia Institute of Tele-Information (CITI). He continues his involvement at CITI in research projects as a Senior Fellow. Dr. Alleman was previously the Director of the International Center for Telecommunications Management at the University of Nebraska at Omaha, Director of Policy Research for GTE, and an economist for the International Telecommunication Union.

Sonia Arrison is director of the Center for Technology Studies at the Pacific Research Institute. Ms. Arrison researches and writes on privacy issues, electronic commerce, e-government, Internet taxation, and telecommunications. She is the author of *Consumer Privacy: A Free Choice Approach*, and co-author of *Western Visions: Perspectives on the West in Canada*, *A Primer on Forced Access and Internet Taxes: What California Legislators Should Know*. Ms. Arrison has appeared on National Public Radio's "Beyond Computers," Talk America's "Computer Daze," Tech TV's "Silicon Spin," and CBC TV's "The National" and "Sunday Morning Edition." Prior to joining PRI, Ms. Arrison specialized in Canadian-U.S. regulatory and political issues at the Donner Canadian Foundation. She also worked at the Fraser Institute in Vancouver, where she specialized in regulatory policy and privatization. Ms. Arrison received a M.A. from the University of British Columbia and a B.A. from the University of Calgary.

Diane Katz is director of science, environment, and technology policy with the Mackinac Center for Public Policy based in Midland, Michigan. Prior to joining the Center, Ms. Katz served for nine years as a member of The Detroit News editorial board, specializing in science and the environment, telecommunications and technology, and the auto industry. Her work has won numerous awards, including top honors from the Michigan Press Association in 1994, 1996, 1997, and 1998.

Steven Wildman is professor of telecommunication studies at the James B. Quello Center for Media Studies at Michigan State University. Prior professional positions include: Associate Professor of Communication Studies and Director of the Program in Telecommunications Science, Management & Policy, Northwestern University; Assistant Professor of Economics, UCLA; Senior Economist, Economists Incorporated. Research interests include: economics and policy for mass media industries; institutional underpinnings of law and regulation for communication industries; universal service policy; and formal models of communication processes. Dr. Wildman's current work includes: rethinking access policies; institutional perspectives on regulatory regimes and investment decision by telecommunications providers; television and Internet services as competitors and complements; and licensing and access to innovations in telecommunications and information services. Dr. Wildman holds a Ph.D. and M.A. in economics from Stanford University and a B.A. in economics from Wabash College.

Executive Summary

Technological change from a circuit-based network to a packet-based network can deliver substantial consumer benefits, but harvesting the benefits in a timely fashion will require a major shift in government regulation. Consumers are thirsting for new technologies, products, and services and are buying them at a tremendous pace from a multitude of providers. That said, this buying public is for the most part unaware of regulatory distinctions between products or services, instead relying on benefits, availability, and price to make purchase decisions. Increasingly, products and services are converging toward packet-based technologies at pace while legacy voice telephony regulations continue to impose delays and unnecessary costs on innovation. These delays and costs create uncertainty, inhibit risk-taking, and slow time to market of new products and services.

This NMRC report examines the current regulatory climate and suggests new regulatory directions for this “new age” in the telecommunications sector. Authors contributing to this report find that telecom is a very dynamic industry that requires dynamic regulation, that regulatory micromanagement of the telecom industry is harmful to the sector, that current pricing policies inhibit network investment, and that a deregulated telecom sector will benefit consumers, create jobs, and provide a much needed boost to economic recovery.

Authors of this report note that government regulation is not adapting to changes in the telecom industry at a pace aligned with the rate of technological advancements. Current regulatory paradigms are facilitating the industry’s economic stagnation and curtailing investment in the nation’s broadband infrastructure. For government to unleash the head-to-head competition that will introduce new technologies and services that consumers want, the authors recommend that government regulators move toward policies that allow telecom companies to focus on innovation, unfettered competition, and consumer benefits.

Alleman, Katz, and Wildman find that the telecommunications industry is a dynamic, ever-changing industry and that “static” regulation is hampering investment, innovation, and benefits to consumers such as greater consumer choice and lower prices. These authors argue that current regulatory policies designed to introduce competition in the local telecom market do not consider the industry’s dynamic nature, especially in the context of the rapid technological changes taking place, increased consumer demand for new products and services, and harmful regulatory policies of the past.

In particular, the changing nature of the telecommunications marketplace, and regulators’ reliance on static policies and pricing formulas such as total element long-run incremental cost (TELRIC) for unbundled network elements (UNEs), do not create truly competitive markets. Alleman, Arrison, and Katz argue that current regulatory policies actually inhibit network investment and slow the advancement of real market competition. The next new age of telecom regulation requires a new approach based on real-world market circumstances and minimal government intervention except where there is market failure.

➤ **Telecom is a Dynamic Industry Requiring Dynamic Regulation**

“The world is dynamic, changing and uncertain,” says James Alleman, professor at the College of Engineering and Applied Science, University of Colorado – Boulder. “Virtually every aspect of information technology and communications (ITC) was under competitive pressure from major and rapidly changing technologies,” says Dr. Alleman. “An appreciation of the dynamic of the marketplace is imperative, something that has sorely been missing to date,” Dr Alleman says. “The key is to implement policy quickly and decisively.”

“No government policy, no matter how well-intentioned, will create a dynamic telecommunications market,” says Diane Katz, director of science, environment, and technology policy with the Mackinac Center for Public Policy. “On the contrary, technological progress feeds on freedom and truly thrives only in the absence of centralized authority,” she says. Ms. Katz says Washington’s tight regulatory rein completely contradicts the direction of technology.

“Digital signals provide speed, mobility and flexibility. Whether via Wi-Fi, a router, or other means, consumers increasingly can access the Internet — for voice or data — without a wireline,” says Ms. Katz. “And yet the regulatory focus remains stubbornly fixed on technologies that date back a century.”

➤ **Regulators Must Not Micromanage All Aspects of Telecom Competition**

Under the “expert agency” regulation that transpired over the past 100 years, many of the policies and rules developed were anticipatory in nature and designed to either prevent or correct market failures by controlling the terms and conditions under which regulated firms could conduct business, according to Steven Wildman, professor of Telecommunication Studies at James B. Quello Center for Media Studies at Michigan State University. This system of regulation “is undermined by the nature and pace of change we are now experiencing in both technologies and services,” says Dr. Wildman. He recommends a legal approach similar to that used by antitrust agencies, which respond to perceived problems as they arise instead of trying to anticipate and head them off.

“The appeal of the anticipatory approach is that problems that are anticipated may be avoided. A downside is that when predictions are wrong, the costs of avoidance may be incurred unnecessarily and markets do not develop as they would naturally,” says Dr. Wildman. “The legal rules approach is also anticipatory, with the responsibility for anticipating the policy implications of future developments placed on private parties rather than government agencies. This may be a better assignment of responsibilities during a time of dynamic technological change emanating from the private sector.”

“Any type of government-mandated pricing plan suffers from what Friedrich Hayek called the ‘fatal conceit’ - the idea that a few very informed people could order societal affairs in ways that would somehow yield results superior to those that spring from the spontaneous order of a free society,” says Sonia Arrison, director of the Center for Technology Studies at the Pacific Research Institute. Ms. Arrison warns that if industry can’t articulate why market forces are better at delivering communications services than regulators, the industry better brace itself for more regulation in nascent technology areas like wireless and Voice-over-Internet Protocol. “Regulators should keep their hands off new technologies unless it becomes clear that there are problems not addressed by the marketplace,” Ms. Arrison recommends.

➤ **Current Pricing Policies Inhibit Investment**

The FCC’s TELRIC formula has been criticized for setting below-cost prices at which incumbent local exchange carriers must lease parts of their networks to rivals. The method that the regulators used, and still apply today, to determine “costs” have been a set of engineering process cost models, according to Dr. Alleman. “It employs a static methodology, based on hypothetical, paper-based engineering systems designed with the ‘best-available’ technology. The method is more problematic and cruder, in many ways, than the older method of examining the company’s books,” he says. TELRIC doesn’t account for growth in demand, the substitution of labor for capital, or for state-of-the-art valuation methods, says Dr. Alleman.

Rather than using the static costing and pricing methodologies, scenario planning tools should be utilized by the regulatory authorities, recommends Dr. Alleman. The key to this analysis, what he calls “contingency” thinking, is that all potential outcomes are explored and their probability of occurrence estimated. “Indeed, had this form of contingency analysis been applied by the Federal Communications Commission to its UNE decision, it could well have taken another course,” he says. “It would have been obvious that most CLECs would not build facilities, but in numerous cases lease facilities. And, if the goal was to promote investment in the infrastructure, UNEs, as constructed, would not support the objective.”

“Markets create competition, which occurs when businesses compete against one another with their own resources,” says Ms. Arrison. “When competitors ‘compete’ against each other with the same resources, it’s not really a

competition. Indeed, not only does forced property sharing fail to produce competition, but this type of scheme also severely discourages investment,” she adds. While consumers might be gaining more choices in the number of telephone companies, they are actually losing because companies are making fewer critical investments, she says. “In the longer run, this drop in investment could be disastrous.”

Diane Katz says that the forced-access regime totally ignores the ferocious competition posed by wireless telephony, and worsens the very market conditions that the FCC majority presumes to rectify in its Triennial Review order. “As is the nature of welfare, the network subsidies actually dissuade wireline recipients from establishing the independent facilities that would constitute meaningful competition,” says Ms. Katz. “Moreover, the incumbent carriers are robbed of revenue that could otherwise be invested in network upgrades and telecom R&D.”

➤ **Telecom Deregulation Would Benefit Consumers**

“If regulators really want to make sure that consumers reap the full benefits of a competitive marketplace, they should rein in their desire to meddle and let the market work,” says Sonia Arrison of Pacific Research Institute. “This means allowing companies to provide high-speed Internet services unfettered by draconian federal or state regulations. It means no subsidies to competitors, no price constraints or controls, and a withdrawal from the micromanagement of telecommunications. If regulators can do this, consumers will be the true winners,” she says.

Current regulatory policies for broadband are hurting consumers and slowing innovation, according to Diane Katz of the Mackinac Center. “Broadband ranks among the biggest losers,” she says. “Local telephone service providers are too strapped for cash to invest in fiber deployment. And adding insult to injury, Congress and state legislatures demanding broadband ubiquity are taxing the industry to create the universal service their policies inhibit. Such policy blunders are all the more tragic in light of potentially awesome advances in digital technology. Millions more Americans could avail themselves of telecom marvels were it not for so obsolete a regulatory regime,” says Ms. Katz.

Background

The Federal Communications Commission (FCC) has a tremendous role to play in creating fair rules for this new era of competition. The Telecommunications Act of 1996 (1996 Act) directed the FCC to create rules that would allow competition in the local exchange market between different types of carriers. In return for allowing competitors to access parts of the incumbents' local exchange networks, incumbent carriers would be allowed to compete in the long distance market. Also, the FCC was directed to make universal service support explicit and allocating the costs to various service providers. Before this, universal service support was implicit in certain carrier access charges. The Act also provided that certain programs would receive universal service support to establish Internet services in schools and libraries and certain high-cost areas.

In enacting the 1996 Act, Congress sought to establish "a pro-competitive, de-regulatory national policy framework" for the U.S. telecommunications industry. The Act imposes obligations and responsibilities on telecommunications carriers, particularly incumbent local exchange carriers (ILECs), which are designed to open monopoly telecommunications markets to competitive entry. The 1996 Act also includes provisions that are intended to promote competition in markets that already are open to new competitors. The 1996 Act seeks to develop robust competition, instead of economic regulation, in all telecommunications markets.

The Act envisions that removing legal and regulatory barriers to entry and reducing economic impediments to entry will enable competitors to enter markets freely, encourage technological developments, and ensure that a firm's prowess in satisfying consumer demand will determine its success or failure in the marketplace.

Congress entrusted the FCC with the responsibility under Section 251 of the 1996 Act to adopt rules to implement local competition. These rules were meant to establish the "new regulatory paradigm" that was essential to achieving Congress's policy goals.

The local competition proceeding was one of a number of interrelated proceedings designed to advance competition, to reduce regulation in telecommunications markets, and at the same time to advance and preserve universal service to all Americans. The FCC recognized the interrelationship between these proceedings and its proceeding to reform its access charge rules.

In contrast to the 1996 Act, the common carrier provisions of the Communications Act of 1934 were grounded in the notion that interstate telecommunications services would be offered and regulated on a monopoly basis. For decades, state legislatures also followed this traditional approach in regulating LECs' intrastate services. Local and long distance telephone monopolies were created and maintained on the grounds that the provision of telecommunications services was a natural monopoly and that service could be provided at the lowest cost to the maximum number of consumers through a single regulated telecommunications network. The monopoly paradigm was thought to further goals of universal service, service quality, and network reliability.

The Modification of Final Judgment (MFJ) that required AT&T to divest the Bell Operating Companies (BOCs) in 1984 was a reduction in the scope of this paradigm. It reflected the judgment that the markets for interexchange services, telecommunications equipment, and information services could become competitive. At the same time, the local exchange continued to be treated as a natural monopoly that required rigorous regulatory oversight by state and federal authorities.

Early in the 1980s academic criticism of the natural monopoly model for the local network was developing. During that time, academics and businesses asserted that technological innovation had eroded any arguable natural monopoly in the local exchange, and that government should eliminate any legal impediments to entry. This view is now embodied in the 1996 Act. The extent to which it can be proved in the marketplace depends on the capabilities of inventors, entrepreneurs, and financiers, as well as the FCC and its state counterparts.

In enacting the 1996 Act, Congress recognized that although removing legal barriers to entry was necessary, it was still not sufficient to enable competition to replace monopoly in the local exchange. As Congress appeared to recognize in enacting section 251, if the ILEC has no obligation to interconnect and to arrange for mutual transport and termination of calls, it could effectively block or greatly retard entry into switched local service by using its economies of scale and network externalities as impediments to entry.

Congress expressly recognized that “it is unlikely that competitors will have a fully redundant network in place when they initially offer local service, because the investment necessary is so significant.” In the 1996 Act, Congress boldly moved to restructure the local telecommunications market so as to remove economic impediments to efficient entry that existed under the monopoly paradigm. In order to offset the economies of scale and network externalities that would inhibit efficient entry of competitors into markets currently monopolized by ILECs, the 1996 Act requires those LECs to offer interconnection and network elements on an unbundled basis, and imposes a duty to establish reciprocal compensation arrangements for the transport and termination of calls.

As the 1996 Act further recognizes, these duties of ILECs are only meaningful in conjunction with the Act's limitations on the rates that can be charged; otherwise, an ILEC could offer interconnection, unbundling, and transport and termination, but at prices that perpetuate its market power. To constrain the ILEC's ability to perpetuate its market power through the pricing of interconnection and unbundled elements, Congress specified that the prices for such transactions should be cost-based and just and reasonable. By freeing new entrants from having to build facilities that totally duplicate the LECs' networks, the 1996 Act has dramatically increased the opportunities for competitive entry and minimized the otherwise overwhelming competitive advantages of large established carriers.

In addition to imposing interconnection, termination, and unbundling requirements in the 1996 Act, Congress also provided for entrants to be able to resell a LEC's retail services. Even if an entrant planned to construct its own facilities, it may still face marketing disadvantages because of the time it takes to construct a new network. Resale enables new entrants to offer at the outset a conventional service to all customers currently served by an ILEC. Some entrants also may choose to rely on resale as part of a long-term strategy as well.

At the same time, Congress plainly intended for LECs in the future to be vigorous competitors, to continue to offer high quality service, and to play a vital role in delivering universal service to all Americans. Nothing in the 1996 Act suggests that Congress intended to divest ILECs of all or part of their local networks, even if some portions continue to be natural monopolies. Indeed, the Act expressly confirms that ILECs may earn a reasonable profit for the interconnection services and network elements they provide.

Consistent with this perspective on competition, the FCC noted that the purpose and, given proper implementation, the likely effect of the unbundling and other provisions of the 1996 Act was not to ensure that entry would take place irrespective of costs, but to remove both the statutory and regulatory barriers and economic impediments that inefficiently retarded entry, and to allow entry to take place where it can occur efficiently. Accordingly, the FCC attempted to craft a policy that was competitively neutral, pro-competition, and not pro-competitor.

The Future of Regulation

James Alleman, Professor
College of Engineering and Applied Science
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Overview

The dynamic market structure introduced by competition in the telecommunications sector was not handled well by regulators (or management). Virtually every aspect of information technology and communications (ITC) was under competitive pressure from major and rapidly changing technologies. These changes began before the 1984 divestiture of the Bell System but were amplified by it, by the Telecommunications Act of 1996 and its implementation by the Federal Communications Commission (FCC), and by rapidly changing technology as demonstrated by the growth of the Internet, the digitalization of cable, satellite television delivery, and the widespread development of wireless services. These forces converged (with others) to build the financial bubble, which ultimately burst.¹

What can the regulatory sector learn from this?² What will be the face of regulation of the future that can correct the current infirmities? Much has been written about the problems of regulation. It is slow, bureaucratic; and by trying to reconcile opposing positions produces muddled and inconsistent directives. In this review, we will focus on one issue: the static nature of regulation, in particular the methodologies that are applied to determine costs and hence rates.

History

Rate-base, rate-of-return regulation

The old method of regulation, known as rate-base, rate-of-return regulation (RoR), involved calculating the historical cost of service and determining the firm's revenue requirement. A historical year was chosen and the operation and capital costs were determined from the balance sheet and income statements. Roughly speaking, this was then divided by the number of customers, minutes, or relevant metric to determine the price of the service. However, both theoretical and practical considerations suggested that this was not effective. On the theoretical side, Averch and Johnson (1962) first showed (and were followed by numerous articles and books which supported their hypothesis, theoretically and empirically) that rate-base, rate-of-return regulation led to excessive investment in capital relative to labor. On the practical side, it is clear that this method of regulation is a "cost-plus" form of control. It is obvious from the formula that the more the firm spends, either in operating or capital expenditures, the more prices increase. The firm has no incentive to save any costs or to be more efficient, since these savings are only passed on to the rate-payer in the form of lower prices. On the other hand, if management hires more workers, and takes other steps to make life easier for themselves, these changes would be paid for by the rate-payers.

Obviously, this was not the best practice; however, it was not until the privatization of British Telecom in 1984 that regulation began to change. The British government realized that it could not simply sell the company to the public without some form of control over its monopoly power.

Calculation of the revenue requirement

$$RR = exp + d_t + r[K - \sum d_t]$$

Where RR is the revenue requirement, exp is the operating expenses, d_t represents depreciation for the year t , r is the rate-of-return on capital and the term in brackets represents net capital, that is total capital less all the depreciation ($\sum d_t$) previously taken.

¹ See Surowiecki (2003) for a brief analysis and summary of the collapse.

² Regulators have some responsibility for the bust, but many other factors are involved. See Alleman (forthcoming).

Incentive Regulation

The government's solution was to implement "incentive regulation." It works in the follow manner: the monopoly is allowed to raise its (weighted-average) prices by no more than the increase in the cost of living. The idea of this practice was that the cost of living index would be a proxy for increases in expenses that the firm would incur. Then, in a brilliant stroke, a productivity factor was added (or rather subtracted). Since the telecommunications industry was experiencing rapid technical change, per unit costs should be declining in line with the productivity factor. Hence, this productivity factor should be subtracted from the allowed price change. Thus, if inflation increased at five percent (5%) and the productivity factor was four percent (4%), the firm could raise prices by an average of one percent (1%). If there were no inflation, the monopoly would have to lower its prices by four percent (4%)! But, if management could lower its costs below the price index (known in the UK as RPI for the retail price index) minus the productivity factor (known as X), then it could keep the difference. Management was "incented" to save costs. It did not need the heavy hand of regulation to force the firm to be efficient; it would do so on its own. Moreover, it addresses the information and dynamic issues. Management is closer to the market and has better information on demand than regulators, and can implement changes relatively swiftly, certainly faster than RoR would allow. Note also, that this method adds an element of dynamism that RoR does not have. As circumstances change, management can adjust its plans.

Incentive Regulation

$$\sum w_i \Delta p_i = \Delta \text{CPI} - X$$

Where the term on the left-hand side is the sum of the weighted price changes, w represents the weight for the service i , Δp_i is the change in price for service i , ΔCPI is the change in the cost of living (price) index and X represents the productivity factor.

It is because of extensive market power that we attempt to control the prices of firms. Thus the other feature of this regulatory structure was the introduction of competition. The idea was that the pressure of competition would force the incumbent to be more cost effective and efficient to maintain its market segment. If a truly competitive environment is to exist – which implies no market power on the part of any one participant – then no price controls are required. However, this is not the case in much of the ITC industry. The threat of competitive entry, it was thought, would be enough to keep the incumbent firm alert to the latest efficiencies and cost savings, otherwise it would lose market share to new entrants.

Incentive regulation was adopted around the world, including in the United States, both at the national level and in virtually all the states. The rate of inflation was determined exogenously – that is, it could not be manipulated by the monopolist. The productivity factor was more difficult and had to be estimated by the regulator. Thus, incentive regulation coupled with open entry of competition into the markets meant that the regulator had only to determine the productivity factor and that the firms would follow the rules.

Cross-subsidies

However, the regulatory life did not prove so idyllic, at least in the United States, for two principal reasons: universal service and unbundled network elements requirements.

Universal service requirements are a set of cross-subsidy practices that are meant to increase telephone penetration, connect the Internet to K through 12 schools, and keep costs to rural areas low. While laudatory in principle, the implementation of these cross-subsidies has proved expensive and ineffectual. The goals can be obtained more efficiently with other means (Alleman and Rappoport 2003). From the perspective of this paper, it means that the pricing structure is not as efficient as it could be, and thus competitors who enter markets on traditional grounds – efficiency, lower cost, or better quality – can no longer do so. The subsidized service removes the potential competitor's advantage. Conversely, inefficient entry may occur in markets that are providing the subsidy, because

the firms providing the subsidy have to bear the additional cost of the subsidy, which the new entrant does not.³ Thus, regulatory intervention is desirable. Since these cross-subsidies are inefficient, our first recommendation is to eliminate them in an orderly fashion. However, given their institutionalization, and the strong political pressures to maintain them, this is unlikely. But this makes our suggestion on “scenario planning,” discussed below, more imperative.

The unbundled network elements (UNEs) requirement is to ensure that competitive firms can connect at “reasonable” rates to the facilities of the incumbent local exchange carrier (ILEC). One of the goals of the Telecommunications Act of 1996 was to promote competition. The Congress (and its regulatory advisors) had been convinced that competition would solve all of the regulatory problems. Unfortunately, the concept of competition it had in mind was not the type that worked in the marketplace.⁴ For competition to be viable, extensive economies of scale and scope cannot exist in the market place.⁵ This is a strong assumption for exchange service. Nevertheless, Congress assumed that it could take place and required the Federal Communications Commission to implement the interconnection requirement for potential competitors. The idea was that competitors could be jump started by allowing the competitive local exchange carriers (CLECs) to interconnect and lease a portion of the ILEC’s network facilities until CLECs became facilities-based.

These cross-subsidies, needless to say, are contentious. But rather than dwell on their failings, which are amply covered elsewhere, we wish to focus on one aspect: the means by which costs of the UNEs and universal service subsidies are determined. Just as the old, discredited rate-base, rate-of-return method was based on costs, so too must these newer regulatory requirements determine costs. However, from the first implementation of incentive regulation until today, the regulatory-cost methodologies have not improved. But this did not deter regulators. They ignored the latest development in valuation analysis, and instead promoted engineering process models.

The method that the regulators used, and still apply today, to determine “costs” have been a set of engineering process cost models. It employs a static methodology, based on hypothetical, paper-based engineering systems designed with the “best-available” technology. The method is more problematic and cruder, in many ways, than the older method of examining the company’s books. In the latter the balance sheet and income statements were subject to audit and were a historical record of what was purchased and what it cost. The new engineering process methods have many flaws: They do not account for growth in demand, the substitution of labor for capital, etc. (Alleman 1999). Moreover, they do not account for state-of-the-art valuation methods (Alleman 1999 and Hausman 1999). In addition, the price sought in these methods is what is termed Total Service (or Element) Long-run Incremental Cost (TSLRIC or TELRIC, respectively). Here the idea is based on the economist’s concept of economic efficiency that in the “best of all possible worlds,” price equals marginal (incremental) cost and public welfare cannot be improved by any change in price from this point.⁶ And, TSLRIC is a good proxy for marginal cost. Unfortunately, this notion is flawed, being based on a static notion of efficiency (Hausman 1999 and Darby forthcoming). The world is dynamic, changing and uncertain. In the context of flawed cost models, inappropriate pricing methods and a price system replete with cross-subsidies, competition as an automatic, social control mechanism to eliminate the potential harm of monopoly power will not work well.

³ The magnitude, degree and even the direction of these cross-subsidies is contentious in the industry. In this paper, we take no sides on the debate, but only note that the above statement holds wherever the subsidies are provided from or go to.

⁴ The economist draws a clear distinction between competition and monopoly with various shades of gray in between. Many policymakers are not as clear and presume that a duopoly (two sellers) will lead to the desired result. Empirical evidence suggests that at least five firms in a market are required to begin to obtain the benefits of competition (Noam 2003).

⁵ De Fontenay and Savin (2003) argue that the incumbent exchange carriers have a historic, institutional advantage, which, although the carriers are inefficient in many sub-sectors of their production process, still thwart entry because of the lack of separations of these functions.

⁶ See virtually any microeconomics text. Willig (1976) shows this is a practical measure and Baumol, Bailey and Willig (1977) shows that, absent cross-subsidies, firms that have potential competitive entrants will find the “correct” pricing structure i.e. welfare enhancing price set because these prices will keep out competitors.

Future Regulation

So, what of the future? In addition to eliminating cross-subsidies, we propose that regulation adopt scenario planning as a tool in developing its policy. This new methodology attempts to account for uncertainty and management's ability to react to changes.

Scenario planning

Scenario planning approaches forecasts as a series of futures rather than a single future.⁷ Rather than using the static costing and pricing methodologies, scenario planning tools should be utilized by the regulatory authorities. In investment decisions, scenario planning methods are known as real options.⁸ The key to this analysis is that all potential outcomes are explored and their probability of occurrence estimated. By "contingency" thinking, rather than a "most-likely" scenario, improved decisions will be made. This is the direction that regulation should pursue. Indeed, had this form of contingency analysis been applied by the FCC to its UNE decision, it could well have taken another course. It would have been obvious that most CLECs would not build facilities, but in numerous cases lease facilities. And, if the goal was to promote investment in the infrastructure, UNEs, as constructed, would not support the objective (Hausman 1999).

Real options methodology

A simple example of an investment will demonstrate the difference contingency thinking can make. The traditional method of valuation would calculate the expected value of the discounted cash flow. If revenues and costs are certain, the methodology is impeccable. However, revenues and costs are not certain – particularly in the current telecommunications environment. Future revenues are difficult to predict, as are costs – uncertainty permeates the future. The traditional method of dealing with this uncertainty is to have a high discount rate – a rate higher than the risk-free rate to account for the uncertainty involved in the forecast of the cash flows. And, indeed, this method works well in a mature, stable industry such as the old telecommunications sector; when competition did not exist and "Ma Bell" was the only provider of service, it could control the introduction of new technology, had modest and predictable increases in demand, and had a well established history of its costs and revenues. For example, during this period AT&T's stock behaved like bonds – reliable and stable. Primarily, its price varied with the interest rate. Clearly, this is no longer the case!

Discounted Cash Flow Calculation

$$DPV = \sum [CF_t / (1+r)^t]$$

Where the term on the left-hand side is the present value of the cash flow, the CF_t represents the cash flow in period t , the term in parenthesis $(1+r)$ is the discount factor and r represents the (risk adjusted) discount rate. Within the brackets are the discounted cash flows. These are summed for all the periods.

In this context, how does one calculate the value of a company or a particular project of a company? As indicated above, the traditional method can be modified by having high discount rates; but this does not capture the fact that management has control of the business. Over time, the state-of-nature is revealed, uncertainty becomes fact; and management can take the appropriate action to continue a project, expand the project, change the course of the project, or shut it down. But how can this be accounted for *a priori*? Real options methodology is an answer. Instead of evaluating the stream of cash flows with discounted present value analysis (see discounted cash flow calculation, above), real options methodology accounts for the options embedded in a project and, using the tools to price financial options, values these options. The methodology replaces the risk-adjusted discount rate with a measurement of the uncertainty of the cash flows. The intuition is that if the options become valuable as the state-of-

⁷ See Federgruen and van Ryzin (2003) for a summary of the methodology.

⁸ See Alleman (2002) and the references cited therein for a more complete explanation of the real options methodology.

nature reveals itself, management can exercise its option and make the investment. If it does not, all that is lost is the cost of the option. Regulators can adopt the same contingency model – obviously in its quantitative analysis such as its cost models calculations; however the same type of contingency thought can be applied to other areas of regulation policy; for example, the setting on UNE prices, evaluating spectrum alternatives, etc.

Financial options

Recall how financial options work. A financial option is the right to buy (a call) or sell (a put) a stock, but not the obligation to do so, at a given price within a certain period of time. The price of the asset is known today. It has a history of a certain level of volatility, the duration of the option is known, as is the exercise price. Given this information, the price of the option can be determined. Later, if the price of the asset is above the exercise price, the option is “in the money” and the option can be exercised for a gain. If not, the option is not exercised and the only loss is the price of the option. The option offers the potential of a large upside gain with a known and fixed limit on the downside loss. The asymmetry of the option, the protection from the downside risk with the possibility of a large upside gain, is what gives the option value. With real options methodology, the idea is similar. The policymaker identifies options within a policy. If the future develops to be desirable, the option is exercised; if the future proves unfavorable, the option is not exercised. If the option is not exercised the only loss is the price of the option.⁹

Applications

Scenario planning and its quantitative form, real options, provide a means of capturing the flexibility of regulators to address uncertainties as they are resolved. Traditional cash flow analysis fails to account for this flexibility and, moreover, it fails to integrate strategic planning. This methodology forces the regulators to evaluate cash flows in greater detail, rather than the simple discounted cash flow view of valuation. The methodology is one that more closely matches the manner in which the firm operates. This view of the world should be adopted by the regulatory community. The use of scenario planning methodology allows the regulatory authority to modify its actions after the state-of-nature has revealed itself. It can investigate its options within the various policy alternatives.

As indicated above, one of the clearest examples of the telecommunications regulators' failure to apply this dynamic analysis is in the use of cost models, which in turn determine TELRIC prices. For example, the cost models used by public policy decision-makers do not account for the time-to-build options available to the firm (Alleman 1999). Indeed, the determination of the optimal price – the dynamic equivalent of the long run incremental cost pricing technique – could use this methodology. Other examples include accounting for the obligations-to-serve costs. If these regulatory impacts are left unaccounted for, there are significant costs to the firm and to society. Indeed, with the real options methodology, one can gain insight into the economic cost of regulation (Alleman and Rappoport 2002).

Conclusion

The regulatory lessons are to avoid cross-subsidies (and to target universal service subsidies to those in need if the policy is maintained). Scenario planning is a tool that can much more effectively examine policy alternatives. It requires a more comprehensive review of alternatives, but one would wish for this in any case. An appreciation of the dynamic of the marketplace is imperative, something that has been sorely missing to date. *Faux* competition should not be promoted – competition should be neither promoted nor discouraged. If the economic conditions exist for competitive entry, it will happen. The role of the regulator is to ensure that the environment is appropriate for competition – it must be technologically neutral, avoid handicapping one sector or another, and prevent or punish price predation or other anti-competitive behavior. The key is to implement policy quickly and decisively.

The introduction of uncertainty can make a significant difference in the evaluation of policies. Effective decisions cannot be made without a fundamental understanding of the implications of scenario planning and, in particular, real options theory. This approach is a powerful tool to be used by regulators to address the effect of uncertainty in the

⁹ Adapted from (Alleman 2002).

industry. Real options methodology offers the possibility to integrate major analytical methods into a coherent framework that more closely approximates the dynamics of the firm's behavior without heroic assumptions regarding the dynamics of the environment.

While the real options methodology has been recognized for nearly as long as the options pricing methods, it has not been used in either the telecommunications or the Internet sectors. Indeed, its value has only recently been publicized within the industry. It has barely entered the analyst's tool kit (Teach 2003). Now is the time to apply state-of-the-art methods to regulation and policymaking.

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It's Time for a Revolution in Telecom Policy Thinking

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Ask the average person what the acronyms ILEC, CLEC, or TELRIC stand for and the response will be a blank stare. This reaction is appropriate because consumers don't think about arcane telecom regulations, which are as outdated as the mainframe systems that couldn't cope with Y2K.

The 1996 Telecommunications Act was supposed to usher in a "pro-competitive, deregulatory national policy framework," but instead the last seven years have been filled with regulatory wrangling and burdensome lawsuits. Through regulations stemming from the 1996 Act, government has created a false "competition" that hampers and distorts investment.

Regulators had hoped that by forcing local telephone companies, the incumbent local exchange carriers (ILECs), to share elements of their telecommunications networks with rivals, the competitive local exchange carriers (CLECs), that they could spur competition and create benefits for consumers. But this thinking was flawed from the beginning because governments don't create competition.

Markets create competition, which occurs when businesses compete against one another with their own resources. When competitors "compete" against each other with the same resources, it's not really a competition. Indeed, not only does forced property sharing fail to produce competition, but this type of scheme also severely discourages investment. Think about it: would you invest in a technology-intensive industry if you knew that many of your competitors could use your technology at below-cost prices?

It is bad enough that the ILECs are forced to share their telecommunications infrastructure with rivals, but state regulators, following rules issued by the Federal Communications Commission (FCC), also decide on the price that should be paid for this access.

TELRIC, which stands for "total element long-run incremental cost," is the model that the FCC requires states to use to decide how much local telephone companies should be compensated for sharing their property with rivals. Although the rules apply nationally, each of the 50 states decides how to implement them, further complicating things with a patchwork of different pricing schemes.

But patchwork problems aside, any type of government-mandated pricing plan suffers from what Friedrich Hayek called the "fatal conceit" - the idea that a few very informed people could order societal affairs in ways that would somehow yield results superior to those that spring from the spontaneous order of a free society. This thinking leads to both short and long-term problems.

In the short term, studies indicate that consumers are already suffering harm from telecommunications red tape. For instance, a recent study by Steven Pociask of TeleNomic Research showed that because of low government-set prices, telecommunications investment has fallen 40 percent over the last two years and consumers now face an "annual decline in economic output equivalent to \$101 per average household annually."¹

So while consumers might be gaining more choices in the number of telephone companies, they are actually losing because companies are making fewer critical investments. In the longer run, this drop in investment could be disastrous. Consider the famous example of what happened to the railways in 1910 when they were subject to price

¹ Steve Pociask, *Competition for Rent: Does Subsidizing Competitors Help California Consumers?*, Pacific Research Institute, forthcoming August 2003.

controls.

The Interstate Commerce Commission denied the railroads an increase in freight rates because “scientific management” ideas told it that the railroads could instead economize on operations. The operators of the railways knew from their local and tacit knowledge that this was not the case, but could not persuasively articulate why. As a result, the railways fell into such a poor state that the federal government was temporarily forced to take over the industry and raise rates. Telecom companies may soon suffer a similar fate.

As Scott Cleland, CEO and founder of Precursor Group said, “At the most basic economic level, the government set wholesale prices below real cost in the high-fixed cost, price-inelastic local access market segment, poisoning prospects for economically sound facilities investment. Unintentionally, government telecom policy is contributing to the destruction of companies, jobs, and shareholder wealth by discouraging economic investment and rewarding uneconomic investment.”²

One might be tempted to argue that the regulatory morass of the past doesn’t matter much when technology has changed things so significantly that in the future, people won’t be making phone calls on copper lines like they do today. That would be too optimistic, but it’s true that things are changing rapidly.

Cell phones and Internet phone calling, such as voice-over-Internet Protocol (VoIP), are increasingly popular alternatives to the traditional landline phone. Unfortunately, it doesn’t necessarily follow that these alternatives will be left alone by regulators. Already, a number of states, led by California, are proposing needless regulations for wireless carriers, and policymakers are beginning to think about what rules might be proposed to govern broadband networks in the future.

In other words, if reasoned arguments are not accepted now as to why market forces are better at delivering communications services to consumers than a group of bureaucrats, there will soon be a whole host of new acronyms that harm consumers, quash investment, and draw blank stares.

There are many different ways to access the Internet including cable, which currently has the most subscribers of any broadband service, Digital Subscriber Lines (DSL) which operate over telephone lines, and wireless and satellite services.

Each of these methods of accessing broadband, the future of telecommunications, are regulated in different ways. The disparity in rules demonstrates that government, unintentionally or not, is yet again distorting the market. This will slow investment in the more heavily regulated areas (such as DSL) and harm consumers.

For instance, Verizon vice-president Tom Tauke recently told a House Energy and Commerce subcommittee that Verizon wouldn’t substantially increase its investments until it was clear that broadband technologies will not be subject to the old clunky rules devised for traditional voice networks. He also asked that government allow providers to compete on an equal basis, letting the market declare who wins and loses.

These requests seem reasonable, particularly since it’s clear no one has a monopoly on the provision of high-speed Internet access, but it’s disheartening that they need to be said in the first place. Regulators should keep their hands off new technologies unless it becomes clear that there are problems not addressed by the marketplace.

Unfortunately, the politics that surround new broadband services are unmistakably old debates. Many businesses try to use government regulations to slow down their competitors, and the arguments made to government regulators

² Scott C. Cleland, *Why De-Regulation Is Now the Dominant Telecom Trend / Theme*, Washington, D.C.: The Precursor Group, November 28, 2001.

are always cloaked in consumer-friendly language. But if regulators really want to make sure that consumers reap the full benefits of a competitive marketplace, they should rein in their desire to meddle and let the market work.

This means allowing companies to provide high-speed Internet services unfettered by draconian federal or state regulations. It means no subsidies to competitors, no price constraints or controls, and a withdrawal from the micromanagement of telecommunications. If regulators can do this, consumers will be the true winners.

True competition guided by the invisible hand, not the many hands of government bodies, will bring more advancement faster, and at lower prices. The wireless industry, which has had an opportunity to be left alone by regulators, is proof of this.

A cell phone used to be the size of a brick and the cost to make a five-minute call could surpass the price of a movie ticket. Today, phones are small and sleek and weekend service is usually free. People from every socioeconomic group possess one of these devices and wireless carriers are often tripping all over themselves for the consumer's business – all without government programs.

Imagine what could happen if government leaves broadband to the marketplace as well.

Dynamic Telecom Industry Bogged Down in Regulatory Obsolescence

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There is no shortage of policy prescriptions to reform America's archaic, economically injurious regulation of telecommunications. Many minds in academia and law — along with politicians and scores of regulators — for years have constructed a variety of policy models to promote innovation and competition in this most crucial of industries.

That's precisely the \$3 trillion problem.

No government policy, no matter how well intentioned, will create a dynamic telecommunications industry. On the contrary, technological progress feeds on market freedom, and truly thrives only in the absence of centralized authority. To the extent government interferes with costly mandates and dictates, telecom innovation and its invaluable economic and social benefits will inevitably suffer.

Laissez-faire, in this instance, is more than mere ideological musing. Recent history is replete with examples of regulatory intransigence stifling life-enhancing and life-saving technologies. The recent accumulation of \$1 trillion in corporate telecom debt and \$2 trillion worth of lost market valuation are but the latest evidence that America simply cannot afford the regulatory status quo.

Case in point is the fed's latest attempt to "open" the telecom market, which would be laughable were it not so ruinous. Comprising an astonishing 576 pages, the order issued on Aug. 21 by the Federal Communications Commission (FCC) will exacerbate the investment disincentives already plaguing the telecom industry.

Most troubling is perpetuation of the "common-carrier" regulatory model that has twice failed constitutional muster and consistently fallen short of its goals. Under the guise of promoting competition, the order requires incumbent local telephone companies such as SBC and Verizon to provide virtually unlimited network access to competitors at below-cost rates. Only a handful of telecom experts the world over — undoubtedly lawyers all — even comprehend the ratemaking formula known as "total element long-run incremental cost," or TELRIC.

This forced-access regime totally ignores the ferocious competition posed by wireless telephony, and worsens the very market conditions that the FCC majority presumes to rectify. As is the nature of welfare, the network subsidies actually dissuade wireline recipients from establishing the independent facilities that would constitute meaningful competition. Moreover, the incumbent carriers are robbed of revenue that could otherwise be invested in network upgrades and telecom R&D.

In Michigan, for example, local competitors pay SBC only \$14.50 per line each month, on average, for full network access — among the lowest rates nationwide. The rate is so low, in fact, that SBC reports losing an average of \$17.50 per leased line each month. Acknowledging the apparent gap between operational costs and the lease price, the Michigan Public Service Commission has wisely agreed to review its rate regulation.

The cheap wholesale rates set by Michigan regulators in 1999 have allowed SBC rivals to market low-cost service plans. Consequently, the proportion of telephone lines managed by Michigan competitors exceeds that of all other states with the exception of New York.

¹ This article was prompted by discussions between the author and the New Millennium Research Council, and is reprinted with permission from the Mackinac Center, which first published it at www.mackinac.org on September 8, 2003.

This may appear to benefit Michigan consumers in just the way Congress intended when it crafted the Telecommunications Act of 1996, which mandated *temporary* network access subsidies to promote competition in local services. In reality, however, the artificially low rates exploited by competitors such as AT&T and MCI WorldCom are simply a form of corporate welfare.

Bell rivals now manage some 25 percent of the telephone lines in Michigan, including a tripling of market share in SBC's service region. But transfixed by the subsidies, new entrants have failed to develop the alternative networks envisioned by Congress. For example, competitors rely on the SBC network to service more than 75 percent of their new customers. But as noted by Cato Institute telecommunications analyst Adam Thierer, "sharing is not competing."

With no real hope of actually overtaking their network patron, these pseudo-competitors instead are lobbying both Congress and state legislatures for more regulatory advantages. Topping their wish list is so-called "structural separation," which would require the Bells to sever their retail services from their network operations.

The goal of structural separation is to strip from the Bells the benefits of network ownership. Forcing the Bells to buy network access under the same rates and conditions as rivals is the only way to create a "level playing field," proponents claim. But creating what essentially would be a new regulated utility would make the telecom network far less efficient, requiring rate hikes to cover higher operating costs.

Meanwhile, SBC's loss of lines to resellers and the concomitant revenue shortfall forced the company to slash network investment in Michigan by 30 percent between 2001 and 2002. Moreover, investors are unwilling to underwrite new telecom infrastructure or research and development given the dismal outlook on industry earnings. This lack of investment undermines service quality and network reliability.

Broadband ranks among the biggest losers. Local telephone service providers are too strapped for cash to invest in fiber deployment. And adding insult to injury, Congress and state legislatures demanding broadband ubiquity are taxing the industry to create the universal service their policies inhibit.

Such policy blunders are all the more tragic in light of potentially awesome advances in digital technology. Millions more Americans could avail themselves of telecom marvels were it not for so obsolete a regulatory regime.

Wireless technologies widely popular in Europe and Asia, for example, are simply unavailable to millions of American consumers because the FCC and Congress refuse to release their 1950s-era chokehold on the broadcast spectrum. Notwithstanding the advent of cable and satellite, through which 90 percent of U.S. households now receive their television signals, Washington continues to hoard the spectrum as if only three networks served the nation. Limits on licenses are applied even before new technology is market-tested.

Spectrum and other regulatory struggles delayed cellular telephony at least a full decade, while architects of ultra-wide bandwidth applications waited even longer. Few entrepreneurs are able or willing to endure such costly obstacles. (In response to pleas for reform, the FCC agreed earlier this year to appoint a task force to study spectrum allocation. This constitutes progress in government terms.)

The economic impact of thwarted technology is incalculable. Forsaken are the manufacture of parts for new products and the thousands of jobs that would otherwise be created. Unrealized are new tools to increase knowledge, productivity and convenience, necessary elements to improved living standards. Forsworn is the multitude of high-tech services upon which our national wealth depends.

Less tangible, but no less dear, are the opportunity costs imposed by regulatory obsolescence. The cellular telephone industry, for example, has been forced to reconfigure existing technology to comply with federal specs for enhanced 911, number portability, and services to the hearing-impaired — all of which could be provided better,

cheaper, and faster through private initiative. The cost-inflation of such mandates detracts from the resources available to develop potentially more promising technologies.

Not surprisingly, Washington's tight regulatory rein completely contradicts the direction of technology. Digital signals provide speed, mobility, and flexibility. Whether via Wi-Fi, a router, or other means, consumers increasingly can access the Internet — for voice or data — without a wire line. And yet the regulatory focus remains stubbornly fixed on technologies that date back a century.

A portion of blame rests with industry incumbents who have every incentive to keep competitors at bay by raising barriers to market entry. AT&T, for example, has fought long and hard to prevent the so-called Baby Bells from entering the long-distance market — and thus moving into broadband. Cable and cellular firms likewise confronted the enmity of telecom incumbents hoping to stave off competition through regulation.

Relief from this regulatory miasma isn't difficult to design. Congress need only sunset existing telecom regulation and declare the market open on a date certain, end the corporate welfare that skews R&D decisions, and marginalize FCC control over spectrum allocation.

The greater difficulty is summoning the political will to dismantle the machine. Thousands of bureaucrats and their allies on K Street as well as in courtrooms nationwide are heavily invested in maintaining the current system. But as America's telecom pioneers have repeatedly taught the world, we can do whatever we imagine.

It's time for Congress to realize this vision by eliminating government barriers to telecommunications progress.

The Pace of Innovation in Communication Industries Favors a Shift from Regulatory Oversight Towards a Legal Rules-Based Policy Model

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Regulation of the electronic communication industries in the United States has been carried out by expert agencies, such as the Federal Communications Commission (FCC) and state public service commissions (PSCs), established and funded as extensions of legislatures. Operating under enabling statutes and more specific targeted laws that set forth their legislatures' broad goals for communications policy, the specifics of implementation are determined by these expert agencies.

In considering alternative governance structures for communication industries for the future, four features of the expert agency system as it operated for the majority of the twentieth century deserve special note. First, the system has been characterized by bargains between government and regulated industries in which firms agree to provide various services (or services to specific customer groups) judged to be in the public interest at a loss in exchange for the government's assurance that they will have the opportunity (if they are efficient and responsible) to earn enough on other services to cover these costs and provide a fair return on investment overall. Government's side of this bargain typically involved protection against competitive entry on the services providing the subsidy, and if the firm was a regulated utility, setting state-approved prices for the subsidizing services that were high enough to cover their own costs plus any price-cost deficits on subsidized services.

Second, implementation strategies and agency contributions to policy development evolved incrementally, and rather slowly, over time. For example, years of experimentation with price caps by individual states preceded their widespread adoption in the 1990s. Similarly, the recent and controversial relaxation of media ownership rules was only the most recent of a series of such moves that began in the mid-1980s.

Third, many of the policies and rules developed under this system were anticipatory in nature and designed to either prevent or correct market failures by controlling the terms and conditions under which regulated firms could conduct business.

Fourth, the analytical framework that inspired policy design was the textbook model of a competitive market with price equal to marginal cost, not a vision of dynamic competition in which firms innovate to displace rivals and realize rather transient benefits of market power before being displaced by a subsequent generation of innovators.

This system was institutionalized at the federal level by the Communications Act of 1934 and by the corresponding statutes of the individual states, many of which predated the 1934 Act. It proved both economically and politically stable for most of the twentieth century. While new industries, such as cable television and wireless telephony, arose and existing industries evolved, until recently this did not create strains that could not be handled within the existing system.

A number of factors contributed to the stability of this system of regulation by expert agency. (1) The services regulated were not close substitutes, at least for most of their customers. Thus regulator inspired changes in prices or services in one sector did not induce significant customer migration to or from another. (2) Different services were delivered by different distribution technologies. This allowed regulators to develop rules premised on a common underlying technology in each industry rather than dealing with the complexities entailed in setting rules for firms with heterogeneous technologies and cost functions. (3) Although they benefited from technological improvements, the economic characteristics of the core technologies remained fairly stable.

Thus the basic technological structures of telephone and broadcast systems were stable from the 1920s through the end of the twentieth century. This stability made it possible to respond to incremental technology innovations with incremental policy innovations that were adjusted further as experience accumulated. Confidence in the stability of the underlying technology and the systems in which it was employed was also necessary to the confidence with

which analysts and policymakers could predict or diagnose market failures and design structural or behavioral remedies.

The Telecommunications Act of 1996 was widely heralded as the beginning a new era for communications industries in which competitive markets would replace the heavy hand of regulation as the dominant force shaping the plans and activities of the suppliers of communications services. Seven and a half years later, implementation of the Act is still a work in progress. However, if we judge the regulatory policies that have been developed since the Act was passed in terms of the four features of the historical system listed above, we find that the new system differs from the traditional system primarily in the first feature.

Under a mandate to promote competition, firms can no longer count on protection from competitors in exchange for providing special services requested by policy makers. (However, the politics of regulation still require that these special services still be provided and it is not yet clear how these political demands will be reconciled with the workings of increasingly competitive markets.) But policy still evolves slowly through incremental steps that are always subject to modification following further review and/or challenge in court.

Witness the current Congressional efforts to rollback the recent relaxation in media ownership rules and the fact that in last February's triennial review the FCC reversed earlier policy that network unbundling requirements apply to new investments in advanced services by telephone companies. As under the traditional system, the policies developed under the 96 Act are also largely anticipatory attempts to create detailed rules and requirements intended to ward off predicted market failures. Thus incumbent telephone operators are required to interconnect with competitors at regulator-approved rates and sell access to their networks and unbundled network elements at prices designed to encourage entry by firms who might not be willing or able to pay for facilities of their own.¹ Furthermore, the market failures predicted are those described by static, not dynamic, models of competition.

The stability in technology and markets that made this approach viable, and perhaps appropriate, in the past is undermined by the nature and pace of change we are now experiencing in both technologies and services. Industry boundaries are becoming increasingly porous as delivery systems are reengineered to expand their capabilities and the Internet (and Internet Protocol), which is not specific to any distribution technology, is employed as a common platform for the delivery of both new, and increasingly, traditional services such as telephony and video.

The long term, and even the fairly near term, implications of many of the changes we are witnessing in communications markets, such as the growth of Internet-based services and the diffusion of broadband, are almost impossible to predict and may well be transformative rather than incremental in their effects. Few would have predicted in 1996 the centrality of the Internet and Internet Protocol to the development of communications services today or the ways in which this has come about. Few would deny now that what has transpired since 1996 is only the beginning of a much larger transformation built on these technologies. In such an environment, the odds that anticipatory policies fine-tuned to specific situations will have their desired effects are low. And when the desired effects reflect static rather than dynamic notions of efficiency, it is not clear that the desired effects are the appropriate goals for policy in the first place.

The anticipatory approach to policy development and enforcement employed by regulatory agencies differs from the legal approach of antitrust agencies in that antitrust enforcement actions are responses to perceived problems that have arisen rather than attempts to anticipate them and head them off. (It might be argued that pre-merger reviews by the Department of Justice (DOJ) and the Federal Trade Commission (FTC) are something of a mix of these two approaches.) The antitrust approach is reactive in the sense that legal actions are taken in response to perceived problems as they arise. The appeal of the anticipatory approach is that problems that are anticipated may be avoided. A downside is that when predictions are wrong, the costs of avoidance may be incurred unnecessarily and markets do not develop as they would naturally. In addition, the pace at which policy develops under the anticipatory

¹ Interconnection prices are typically determined through negotiations between incumbent carriers and their competitors. As products of negotiations between private parties, they are a step away from a system in which rates are set directly by regulators. However, because negotiated prices are subject to regulatory approval and the negotiators understand that a price will be set by regulators should negotiations fail to produce one, they cannot be considered freely negotiated market prices.

model is a constraint on the rate at which new technologies and services are deployed. The rap on the more reactive legal approach is that problems can only be addressed after they develop. But this criticism has little bite when the likelihood that future problems will be correctly predicted is low. It is also somewhat overstated in any case. Antitrust, and legal systems of remedies in general, operate through the application of broad principles to specific cases as they arise. If the principles are generally known, private actors should factor the enforcement of these principles into their forward-looking plans. From this perspective, the legal rules approach is also anticipatory, with the responsibility for anticipating the policy implications of future developments placed on private parties rather than government agencies. This may be a better assignment of responsibilities during a time of dynamic technological change emanating from the private sector.

Because the FCC's efforts to enforce competition policy are in many ways duplicative of those of the DOJ and the FTC, a number of commentators have suggested that the antitrust authorities should be given sole responsibility for competition policy for communication industries. I do not want to take sides on the question of whether a commission of industry experts is better or less qualified than an agency of antitrust experts to further the goals of competition policy for communication industries. However, the argument outlined above suggests that in an era of rapid technological change and unpredictable innovations in services and competitive strategies, such as we are witnessing now, there likely are benefits to be realized from a shift towards a more legal rules-based, "reactive" approach to policy development and away from the anticipatory intervention approach of the past.