The Implications of the Integrated Broadband Network for Regulatory, Pricing, & Public Policy

Miller, Edythe S.

Columbia Institute for Tele-Information
Graduate School of Business
809 Uris Hall
Columbia University
New York, New York 10027
(212) 854-4222

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Edythe S. Miller

Much of the conference on the topic of the Integrated Broadband Network (IBN) that formed the basis for this volume focused upon five major interrelated themes, each encompassing a number of attendant issues. The five broad topic areas were:

1) The definition of IBN. Can a core concept of IBN technology and function be identified?;

2) The demand for IBN. Does a demand for the services and capacity of IBN now exist or, alternatively, is it to be anticipated that the demand will evolve pari passu with the development and deployment of the technology?;

3) Whether the development of IBN should be encouraged and, if so, the policies to be implemented to achieve this result;

4) The risks, costs and benefits of developing and implementing IBN, and their appropriate distribution; and

5) The appropriate locus of control of IBN, and the rules for that control. Implicit in this question is the related one of the appropriate market structure for the provision of IBN.

The determination of these issues will have important implications for the nature of the "information society" that popularly is foreseen as the world of the future. While the primary focus of the article is upon the last two questions listed above, it will be useful briefly to consider

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some aspects of the earlier topics both to assess their influence upon and to lay a foundation for a discussion of the later ones. Because the questions are substantially interrelated it will not be possible consistently either to examine them seriatum, or to explore each in isolation.

Definitional Considerations

The conference consideration underlying and framing the contents of this volume was appropriately discursive. A few areas of emergent consensus were discernible. For the most part, however, and probably unavoidably so at this stage in the process, we are confronted with more questions than answers.

Even the most basic definitional attributes of IBN, i.e., its fundamental technology and function, arguably the least contentious of the issues, remains a bit murky. There is general agreement that IBN essentially involves the melding of separate, parallel transmission systems into a single (one pipe), high capacity (perhaps 135 Mbps), fiber optic network for the transmission of voice, data and video of improved quality (e.g. HDTV) at high rates of speed. There also is broad agreement that the financial requirements of the installation of such a technology will be substantial, with a figure of $200 billion suggested as a not unreasonable approximation.

Beyond this, however, there seems precious little unanimity. And even within this basic agreement there appears to exist some ambiguity. The discussion is further muddled by the cloud that reasoning from a private interest (financial, institutional and sometimes even professional) casts upon claims to objectivity. The basis of analysis advanced in the name of

unadulterated logic often turns out to be lodged instead in questions of control, power, profit or faith--or, in any event, indistinguishable from responses so lodged. This is as true for such purportedly neutral issues as, say, standard setting for technology and interconnection as it is for the acknowledgedly more inflammatory ones of costing, pricing and market structure.

Included among the many unsettled questions within the general category of the definition of IBN are some very fundamental ones. By way of example, whether the IBN concept implies a switched system is a matter of some dispute. In this regard it should be noted that cable television (CATV) currently employs a non-interactive, tree-and-branch configuration. Such a technology by itself cannot provide, for example, "television on demand." The telephone network, in contrast, is interactive, star configured and switched (Baer, pp 273-4).

In addition, while at first blush it may seem almost to go without saying that a digital technology is a necessary component of IBN, the practicable extent of its deployment also is a controverted matter. In this context it is useful to keep in mind that CATV transmission employs analog signals and coaxial cable. In contrast, the telephone industry presently is proceeding apace with a digitization program.[1] The telecommunications industry currently also is conducting selective experiments with "fiber to the home" for the distribution of digital voice, data and video to certain "upscale" residential and business customers (Warr, p. 13). But fiber is not now in general use for the

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[1]For example, AT&T plans to be fully digital on its switched, domestic traffic by the end of 1990 (Guyon, October 21, 1988, p. A2).

local loop and, in the ordinary course of business, is not expected to be so for a good many years.

A digital technology promises to increase speed of delivery, and is capable of "bursty" transmission, characteristics that work indirectly to expand capacity. But it also presents an accommodation problem. Much of the current stock of terminal equipment does not accept digital signals (Harrold and Strock, p. 75). Video, for example, is produced and received by means of an analog technology. A digital network inclusive of television would require substantial additional investment in interfaces to enable current equipment to convert and appropriately route signals. Moreover, in most locations, switching capacity is not presently sufficient to support the transmission speeds and bandwidth requirements of video (Selwyn, May, 1987, p.7). On the other hand, however, it also generally is reasoned that the financial viability of IBN is video dependent; that is, that the primary source of a revenue flow sufficient to recover the substantial costs of IBN is entertainment video (Sirbu, et. al., p. 15). Video transmission has the potential to be the most lucrative of all "information services."

Moreover, if the transmission of video is not to be part of the package, the very need for the high capacity of broadband fiber technology is questioned. It is contended that the capacity requirements for the transport of the projected new communications and information services (services that in themselves are not much more, it is suggested, than extensions of the old) excluding video, appear to be compatible with N-ISDN and copper loops (Sirbu, et. al., p.15). That is to say, it is maintained that if the services to be provided do not include the

transmission of moving images, a broadband technology will not be required.

The Question of Demand

There thus appear to be some fundamental unresolved conceptual and practical questions about IBN that underlie and are anterior to the issue of whether the services it will supply will find a market. But putting these aside for the moment, a comment on the topic of demand may prove helpful.

To ask if a demand for a service exists, or even if it will develop is, to a large extent, to misspecify the problem. The question contains an implicit assumption that demand is out there, a bit like Sleeping Beauty, waiting to be quickened by the appearance of a new product.

It has been pointed out by certain economists for many years that wants are not innate and constant but rather are susceptible to manipulation by outside forces. Thus, for example, the American institutional economist Thorstein Veblen, many years ago, challenged the notion that human wants are intrinsic and stable by inverting the old adage that "necessity is the mother of invention" to read instead that invention is the mother of necessity. The influence of persuasion and emulation upon demand is palpable in all economies. Of course, the success of specific promotional efforts is not guaranteed, as is attested by the lack of response to marketing efforts for the Edsel automobile or picturephone.

In any event, it is clear that whatever the demand for IBN, it will be a derived demand. Consumers on the whole, will be ambivalent about whether video comes to them by way of an underlying analog or digital

signal, or whether it is fiber or copper wire that carries their phone conversations. The demand will not be for the underlying technology--the one pipe, the type of cable or signal--but for the services the technology delivers. It will be a function of the composition, usefulness, ease of use, quality and price of the services transmitted. It also will be a function, moreover, of such seemingly ethereal (and, in any event, nonquantifiable) but nonetheless real and powerful influences as the perceived relation between usage and personal image or reputation, a relation that it will be the responsibility of advertising and marketing departments to establish.

There are thus no unambiguous, and certainly no simple, answers to the first two questions posed. Neither the technology itself, the services it will provide, nor the demand that will be generated are capable of exact, or even roughly approximate, specification. But that is not to say that the further deployment of an IBN technology should be stayed. An essential characteristic of research is its future orientation. The future, by definition, is unknowable. We will continue to construct our models of demand, of course. But forecasts of the future, creatures that they are of assumptions of indeterminate quality, are uneven predictors. The results of breaking new ground always have been inestimable. They may be of negligible or substantial benefit to future generations, a matter of loss or gain to those involved in the supply.

Current IBN research may, indeed almost assuredly will, yield unknown, unexpected and unintended fruit. The only certainty in all of this is that the many associated uncertainties imbue the undertaking with substantial risk. It is important to recognize that much of any

discussion of, say, policies designed to encourage development of a technology, or of applicable costing and pricing practices, or of conditions for the vesting of control is actually about a desired distribution of risk and reward.

The determination of risk and reward in any future IBN scenario, in turn, will be influenced substantially by the market structure adopted for its provision. It also is important to recognize, therefore, that among the uncertainties that surround the future of IBN, in addition to such questions as the probable identity of providers and the sources of its funding is that of the organization of the market for its services. Underlying the topic of market structure, and influencing it in myriad ways is a belief set, a system of thought about the most appropriate and efficacious means of industrial organization; that is, an economic philosophy.

There seems little doubt that the telephone industry, in one role or another, will be a major participant in any future provision of IBN. This is not to suggest a dearth of rival claimants, nor that there will exist no opportunity for collaborative effort. The telephone industry comes to the threshold, however, equipped with certain technical advantages, over and above the obvious financial and political ones that may obtain. Its network is pervasive. Its switched and interactive character provides an edge over competing technologies. Its existing initiatives in areas of fiber installation and digitization afford it primacy. That noted, however, the question of whether its role should be solely that of carrier (in the current jargon, conduit only), or if it additionally should be involved in generation and/or packaging (content) remains, as does, in

either event, the question of appropriate market structure. Market organization also would be an open question in regard to cable industry involvement in IBN, despite the current operation of the cable industry as an unregulated monopoly provider.

The telecommunications environment has been characterized by extreme volatility at least since the settlement of the AT&T anti-trust suit. Some recent proposals for reform promise to perpetuate that pattern. It is important to note that these reform proposals also are suggested for application to the provision and pricing of IBN. To fully understand the basis of the proposed alternatives to traditional regulation requires an appreciation of the ideological shift that preceded and underlay recent policy changes. Accordingly, in the sections that follow, I propose briefly to examine these interrelated matters, focusing first upon the issue of the shift in economic philosophy that provides the foundation for the policy initiatives, and thereafter upon current policy developments within telecommunications, and that are proposed for extension to IBN. Finally, I will attempt to evaluate the proposals in application to IBN.

The Background to Regulatory Reform

The trend in market structure in this nation, for at least the past decade, clearly has been deregulatory, part of a more general economy wide movement to minimize the presence and involvement of government in economic life. But, it also should be recognized that deregulation was not initiated in response to a broad public outcry about the performance of regulated industries. That their performance was not perceived as problematic has led one generally favorable analysis of deregulation to conclude that what it identifies as "procompetitive regulatory reform" was

a policy prescription "in search of a widely perceived problem" (Dirthick and Quirck, p. 38). In the period immediately prior to that in which deregulation initially was undertaken, polls indicated that the public generally was quite satisfied with the services of the regulated industries (Dirthick and Quirck, pp. 11, 11 n.27, 24, 24 n.49). Even among the general body of academic economists, inclined toward laissez-faire policies, it probably is safe to state that a belief in the desirability of so rapid and widespread a dismantling of the regulatory machinery is a conversion of fairly recent origin.

How and why then, did so dramatic an ideology and policy shift occur? For explanation of that puzzling turn of events one must look to both the doctrine and dogma of academic economics. That is, during this time period, in its teachings, economic theory was being carried to its logical extreme, and was barring any and all exception, and in its preachings economics, more than at any time in recent history, brooked no dissent.

A brief schematic outline of some relevant historical and contemporary orthodox economic dicta may be useful at this point. Historically, traditional economics has been centered upon a set of singular and highly stylized assumptions about both human nature and the economic universe. It takes as its starting point and point of reference the lone individual rationally choosing among alternatives that he has had no hand in shaping. The so-called rational economic man, the ideal type of the traditional economic literature, bases his choices upon cost/benefit considerations only, that is, upon maximization principles, acting out of the sole purpose of achieving maximum profit and utility, at minimum

expenditure. He seeks only and always to gain the highest pleasure at the lowest cost of pain. Traditional economics thus finds its essential behavioral bases in individualism, rationality and maximization. Contemporary economists appropriate in its entirety this human behavioral model.

Also reserved by contemporary economists from the traditional model is its sole focus upon efficiency in its strictly economic sense. Efficiency finds its meaning in individual actitivy; social efficiency is perceived simply as additive, as the sum of individual efficiencies. Efficiency is viewed both as end and means. The "efficient allocation of scarce resources to given ends" is taken, at one and the same time, as means to achieve and as identification of an optimal state of being.

It is in the perception of the economic world that contemporary schools diverge to some extent from traditional teachings. In a sense, they do not so much differ from past versions of normal science as carry to a logical conclusion its premises and inferences. Normal science portrays an economic world that is comprised, on the whole, of well functioning, well behaved competitive firms subject to the control and guidance of automatic market mechanisms. The fulcrum of the ideational set is the free market. The unimpeded operation of market forces on competitive firms will result in the highest possible degree of individual efficiency. Economic performance will be enhanced if government does not interfere with the operation of business enterprise. Government should participate, if at all, only as referee.

But, at least until quite recently, even in the orthodox formulation there were exceptions noted to that general rule. The exceptions carved

out of the more general formulation were believed to obtain because the free market was seen as subject to occasional malfunction; malfunction caused by the existence of market imperfections. Market failure was said to occur when certain suboptimal technical conditions of operation obtained. Thus, for example, a state of natural monopoly was believed to exist when conditions of economies of scale (the ability to produce increasing quantities at progressively lower average unit cost) prevailed, relative to the extent of the market. The existence of natural monopoly conditions, especially when the good produced was perceived broadly as a necessity, was the rationale in the United States for the adoption of economic regulation of public utilities organized as monopoly providers. It was widely accepted that, under the circumstances, the alternative to economic regulation was expensive duplication and excess capacity (frequently associated with predatory pricing and remonopolization) in the case of open entry or, in the case of private monopoly, unacceptable consumer exploitation.

Some additional exceptions to the general rule, exceptions also used to justify government intervention, were specified by standard theory. Thus, for example, commodities for which there was an inability to exclude from beneficial use (e. g. national defense, lighthouses) were labelled collective goods. Goods to which exclusionary methods could be applied, but in which there existed a social interest in ensuring an increase in output over what a free market would provide (e. g., education, health services) were dubbed merit goods. A category of "goods and bads" attaching to the production of private products, but with values inappropiable through standard accounting practices (e. g., pollution,

acid rain) was labelled externalities. The recognition of exceptions to the general rule carried with it the implication that under certain circumstances, the application of human discretion would yield results that were preferable to those of the workings of automatic market mechanisms.

What contemporary orthodoxy initiated and, in the end, achieved was an inexorable chipping away at the foundations and framework of the support for social control. So complete was its success, it calls to mind the comment of the British economist, John Maynard Keynes, himself no slouch when it came to indicating new directions and perspectives for economic analysis. More than fifty years ago, in a frequently referenced comment, Keynes noted:

> ...the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back (p. 383).

The comment has striking applicability to changes in the theory and practice of political economy in recent years, with particular reference to the social control of business.

The writings of contemporary economists on the topic of markets and regulation were appropriately abstruse and inaccessible to all but those initiated into the mysteries of the profession, as befits the hallowed traditions of the economics discipline. However, they told a simple tale and one that easily was assimilated and translated by popularizers. Their message was that market control, in almost every conceivable case,

is preferable to social control.

The literature of economics now is replete with examples of scholarly work in this tradition. The message is a repetitive one. For example, collective goods are redefined as private and individual, and as conformable to disposition through private market processes (e.g. Coase, 1974). The use of subsidies and taxation to encourage or discourage production and consumption is portrayed as perverse and self-defeating (Friedman [b], pp. 177-189). Externalities are defined in ever more narrow terms and, finally, are shown as amenable to collapse into the private transaction itself (Coase, 1960). Monopoly power is portrayed as ephemeral and subject to erosion by the winds of change; for example, by successive waves of technological advance and successive gales of entrepreneurical energy (Friedman [a], pp. 28-9). In the interim, its product better is distributed through the utilization of such market oriented processes as bidding and auction systems, obviating the requirement for regulatory oversight (e. g. Demsetz).

Moreover, even if there were gains to be achieved from government involvement, it is maintained, their achievement would be thwarted by the process of regulation and the nature of regulators. In this literature, regulators are depicted, as are all participants in the economic process, as rationally attuned to the main chance. It is in their private interest to be, or to become, agents or pawns of regulated interests. In the writings of successive contemporary economists, regulators are portrayed as inept, or manipulable, or worse; regulation is portrayed as invariably ineffective or perverse in its effects (e. g. Stigler; Peltzman).

The literature of contemporary orthodox economics laid the groundwork

for and otherwise encouraged work by followers and imitators. A trickle became a groundswell. One example of work that came after and to some extent pushed at the frontier of the system of thought is the Theory of Contestable Markets. Contestability theory was developed by a group of economists associated with the pre-divestiture Bell system, and is used primarily in application to the telecommunications industry. Boiled down to its bare essentials, it holds that the dissolution of entry and exit barriers, by creating the potential for competition, will be sufficient even in highly concentrated markets to bring about competitive results. That is to say, if legal barriers to entry and exit are removed, regulation is rendered unnecessary. Monopolists, rational beings that they are, will refrain from pressing monopoly advantage out of awareness that monopoly results will attract competitive entry (Baumol et. al.)

With startling rapidity, and even while insisting upon the value neutrality of the discipline, the economic parable of free and automatic market mechanisms and limited government took on something of the character of revealed truth. It swamped the academic literature, and trickled down to the popular press. It became the common stuff of newspaper editorial. The simple theme became an insistent fugue. In the end, so temperate an economist and former regulator as Alfred Kahn concluded, in an introduction appended to a recent edition of his well-known work on economic regulation, that "even very imperfect competition is preferable to regulation" (p. xxiii).

Moreover, the simple tale had broad appeal across the political spectrum, radiating both right and left. A scholarly rationale for the placing of ever further limits upon the role of government was attractive

to political conservatives; scholarly support for calling into questio the motives and actions of individuals in positions of place and privilege appealed to the latent antiauthoritarianism of political liberals. Conservatives and liberals became the strangest of bedfellows; allies in the movement for deregulation. The message could not have found a wider mark if it had been designed with that purpose in mind.

Current Programs of Regulatory Reform: Alternatives to Traditional Regulation

In the contemporary literature, economic regulation repeatedly is faulted for creating many of the distortions it was put in place to avoid or correct. It is criticized both on efficiency and equity grounds. Thus, for example, the following complaints are registered: its complex and burdensome nature absorbs resources that otherwise would be put to more productive use; its Averch-Johnson (rate base padding) effects distort investment decisions and allocative efficiency; its cost-plus nature provides a disincentive for least cost operation; its cap on profits discourages innovation. In sum, it is contended, these disincentives retard the growth of the pie, and thus limit the size of individual slices. That is, not only does economic regulation diminish the total product, but in so doing it adversely affects individual income distribution.

The ideological shift has important public policy implications. Regulatory reform or outright deregulation is advocated to prevent these ill effects. Regulatory reform uniformly is identified with "relaxed" or "flexible" regulation and equated with a reduction of regulatory control.

In the current climate of opinion, there is a general inclination to interpret any change in industry organization as a movement in the

direction of deregulation. It is important to recognize, however, that not every structural modification, even if taken in the name of deregulation, is deregulatory in effect. For example, the AT&T divestiture agreement sometimes is held out as a step toward deregulation although it had little bearing on regulatory status per se. What it did effectuate, however, along with the separation between AT&T and its operating companies, was the termination of the provisions of a former consent decree that excluded AT&T from all but regulated communications markets, and the specification of certain lines of business from which the Bell Operating Companies (BOCs) were to be barred. That specification implied, in effect, that certain other areas could be opened to their entry. That is to say, the divestiture agreement set the stage for the diversification that currently is taking place in the industry. The provision of IBN by the telephone industry would be a further step along that path.

The pursuit of diversification is not unique to the telephone industry. Cable interests also are looking to diversify beyond primary fields. For both industries diversification should be seen as part of an economy wide trend toward merger and acquisition, frequently taking effect through takeover and leveraged buyout.

The telephone industry brings to the diversification scenario a unique feature, however. It fans out from a more or less protected base where it operates as a naturally monopolistic provider of a demand inelastic public utility service that is "affected with a public interest," a term that seems oddly anachronistic in today's heady ambience. In an age that gives little credence to the very existence, much less the potential abuse of

private market power, that circumstance in itself confers upon the telephone industry substantial maneuverability in its dealings both with rivals and customers. And nor does the substitution of price-capping for traditional rate base regulation, sometimes advanced as the quid pro quo of the authorization to diversify, ensure against abuse. To the contrary, it is more likely, for reasons to be enumerated below, to serve to increase the maneuverability that makes possible that abuse.

At the time of the divestiture it was not generally foreseen, not even by many in, so to speak, the "telecommunications loop," that the operating companies would be divested as eight mini-AT&Ts, each retaining within its operating area much of the bottleneck power of its former parent, even while seeking eagerly to branch out into other lines of endeavor. Since divestiture, the regional holding companies (RHCs) have diversified broadly into activities ranging widely over the business spectrum through the formation of unregulated subsidiaries. Almost all of the line-of-business (LOB) waivers requested by the RHCs of U.S. District Judge Harold Greene that did not involve activities that would put them in violation of the LOB restrictions of the Consent Decree that is, the manufacture of equipment or the provision of interstate or information services, have been granted. The divestiture court recently removed the restriction against telco transmission of information services on the grounds that this would beneficially affect availability of such service. It retained, however, the prohibition against the generation of information content.

The RHCs also have been lobbying assiduously for the lifting of the consent decree LOB restrictions (Greene, p. 17) and the cross-ownership restraints contained in both the 1984 CATV Act and the FCC rules. The

FCC has signalled a probable future intent to change its rules to allow local telcos to provide cable service in their local service area and to recommend to Congress that the restrictions of the 1984 CATV Act be eliminated (Selwyn, Aug 1988, p.10).

The pressure to overturn the Consent Decree and CATV Act LOB restraints is part of a general diversification strategy that would apply also to the provision of IBN. Diversification, in turn, in combination with the new pricing policies under broad consideration for telecommunications, is a means of risk shifting and sharing.

In March 1989 the FCC, in what is widely apprehended as a transition step toward full deregulation, (Carnevale and Guyon, March 17, 1989, pA3) replaced rate of return regulation of AT&T with a long-debated policy of price-capping, effective July 1, 1989 (Second Further Notice). Many of the States also are in the process of considering and implementing one form or another of price-capping. Among the provisions of the plan adopted by the FCC, are the following: The notice period for rate changes is shortened to 14 days. The burden of proof is shifted from AT&T to its competitors. In addition, and crucially, increases in prices are indexed to a general inflation rate, the Gross National Product Price Index (GNP-PI) less three percent. The three percent downward offset is intended to reflect an expected two and one half percent productivity increase and a one half percent "consumer dividend." Certain other costs deemed to be beyond company control and for which the cap also is to be adjusted are identified as "exogenous costs."

The price cap is to be applied discretely to three "baskets" or categories of service: 800 service, other big business service (including both private line and switched), and small business and residential

service. Rates for individual services within each basket, although subject to certain upward and downward limitations, may be increased and decreased without regard to the cap, so long as the price of all services of which the category is comprised conforms to the cap. The Commission indicated its intent to adopt a price cap plan for the interstate services of the larger local exchange companies, including the RHCs, by July 1990. (Second Further Notice, pp. 180-182)

Before proceeding with a discussion of some potential flaws in the new policy, a general point bears repetition. The interrelation and interdependence of the constituent elements of this set of circumstances can not be overemphasized. The shift in theoretical perspective resulted in a delegitimization of regulation and the transfer of an imposing burden of proof to advocates of any form of social control. The movement by regulated industry to diversify places a significant component of its activity beyond the reach, and even the view, of regulation. The substitution of price-capping for rate of return regulation ties pricing policy to automatic mechanisms, eroding regulatory authority and discretion even further. It also strengthens the inherent potential for cross-subsidization and discriminatory and predatory pricing, although adopted ostensibly in the service of diminishing or terminating incentives for these practices.

Current Proposals for Regulatory Reform: The Potential for Abuse

In general terms, the potential for abuse inherent in diversification programs such as IBN has its basis in underlying network characteristics. As has been noted, the telecommunications system is distinguished by economies of scale and scope. IBN will partake of these characteristics. It is evident that minimum scale will be increased by implementation of a

broadband, fiber, digital technology. Network services will be vastly expanded.

It is extensively recognized that if an activity occurs under conditions of scale and scope economies relative to the volume of demand, the largest supplier has the ability to operate under lower average unit cost conditions than smaller suppliers. High threshold levels of required investment also translate into high ratios of fixed to variable costs and of assets to sales volume. Excess capacity, combined with the substantial output required to achieve lowest unit cost, virtually courts the adoption of pricing patterns of destructive competition (i.e., rate wars) or conscious parallelism in price setting (i.e., price leadership), often implemented sequentially.

In addition, telecommunications is distinguished by the presence of certain bottleneck features that give it important market power. This was, of course, the basis of the AT&T anti-trust suit. It also is the basis of the FCC Open Network Architecture (ONA) policy, a policy which seems to date to have been less than fully successful.[2] Indeed, it has

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[2]A June 1988 article in the Wall Street Journal characterizes the struggle over ONA, in part as follows: "The Bells are jockeying to keep as much control as they can, while independent vendors are demanding maximum latitude of choice at the lowest possible price....

Information service companies and the Bells can't agree on how the telephone network's 'building blocks'...should be sold. Most Bells propose to continue selling the blocks in bundles...

But information-service vendors, wary of the Bells' monopolistic tradition, insist on the right to buy only the parts they will need....

...[S]ome Bell companies argue that the network's building blocks need to be sold in packages to keep from putting a dangerous strain on the network....

Pricing has also contributed to the ruckus. Information-service vendors want the network's building blocks to be priced primarily on the basis of cost. But most Bells favor setting prices according to what the market will bear" (Amparano and Carnevale, June 21, 1988, p.6). For the general approval by the FCC of Bell ONA plans see Davis, November 11, 1988, p. B4.

been suggested that the RHCs' ONA proposals have resulted, not in unbundling as intended by the FCC, but rather in rebundling. (Selwyn, March 1988, pp. 3-6). If the provision of IBN is to be a telephone industry function, that bottleneck power will be further leveraged. The potential for abusive use of the bottleneck will be vastly increased even if employed only as conduit and, even more so, if also engaged in activities involving content.

The local loop is a principal bottleneck. It is the means by which the consumer accesses the world and the world accesses the consumer. There are no competitive alternatives to the local loop, whether provided by twisted copper pair or by optical fiber. Technological progress will not alter that fact. Nor does it alter the fact that the local loop is, and will be into the foreseeable future, under the control of the RHCs. Moreover, only the monopoly provider has the power of eminent domain, endowing the local exchange carrier (LEC) with sole claim of right of way to consumers, an important legal and economic advantage. Even if there were none other, the existence of the local loop bottleneck would provide its gatekeepers significant ability to price noncompetitively in demand inelastic markets and to forestall and limit competition in ancillary markets.

These tendencies are compounded by the high proportion of joint to total costs that prevails generally in the industry. The predominance of joint costs makes possible a market segmentation that shifts costs from high volume customers with supply options to captive, low volume customers. Oligopsony consumers are able to demand, oligopoly providers to supply, favored treatment, all in the name of "putting the costs on the cost causers."

The recent pattern of cost shifting has been unmistakable. It has consisted of moving costs (accounting artifices, for all their assumed independent factuality) from interstate to intrastate to local exchange and from demand elastic to demand inelastic services. This has been accomplished through such means as changes in separations and settlements, the imposition of the subscriber line charge and modifications in depreciation schedules and rates resulting, discretely and in combination, in sizable increases in minimum bills.[3]

The replacement of rate of return regulation with price-capping in diversified, segmented markets presents companies operating within these markets with a variety of opportunities for cross-subsidization. The strategic alternatives shape a scenario in which profits earned from demand inelastic consumers in protected markets will be used to cover fixed investment, including that for research and development (R&D). Services in competitive markets then may be priced at or slightly above variable cost. This is justified on the grounds that the fixed costs, by

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[3]Some recent industry actions and FCC rulings further illustrate the possibilities. For example, AT&T currently is engaged in a program of rate "customization" or discounting for its largest customers, (Selwyn, Sept. 1988, p. 5; "Inside the FCC", Oct. 1988 p. 22; Guyon, December 8, 1988, p. A3). AT&T's Tariffs 12 and 15 are examples of the implementation, in the name of "meeting the competition" and "price flexibility," of principles of market segmentation and price discrimination based upon differential usage. A recent FCC ruling held that AT&T's Tariff 12 was illegal. The finding of illegality to the contrary notwithstanding, the FCC, curiously and somewhat inexplicably, found that existing customers could continue to take service under the tariff until AT&T filed revisions, and that complaints were to be handled on a case-by-case basis, affording AT&T appreciable slack. (Carnevale, April 13, 1989, p. A4) An additional example is provided in a recent FCC order concerning Access Tariff charges. The FCC found that the LECs improperly had been allocating inside wiring and maintenance cost to regulated activities and, moreover, that they systematically had been overstating these costs. (Selwyn, April 1989, pp 4-5)

definition, would be incurred if the competitive activities were not pursued; that is, by employing a version of "stand alone pricing" that currently has found favor in the telephone industry.

The volume of sales made possible by the pricing strategy tends to encourage R&D while moving the company employing it down the experience curve. It is claimed, further, that the increased volume of sales makes possible an additional revenue stream to regulated services beyond that which otherwise would have been received.

Alfred Kahn notes an emerging consensus, and in his view an appropriate one, in favor of stand-alone pricing[4]. In his words:

> [S]o long as rates to demand elastic customers cover incremental costs, on the one hand, and rates to demand-inelastic customers do not exceed the costs of supplying them on a stand-alone basis, the latter cannot be said to be subsidizing the former (pp. xix-xx).

The FCC also lends support to the policy in its price cap plan. It adopts an average variable cost standard as the criterion for determining if a proposed rate decrease is to be suspended for investigation (p. 242). In addition, tarrifs for new service (to be filed on 45 days notice) must comply with a "net revenue standard;" that is, new services must be projected to increase revenues for AT&T's price-capped services (pp. 252-3), giving a slightly new twist to the old Bell system burden test. The FCC also "tentatively" indicates an intent to use the same approach for the LECs (pp. 387, 393).

It is undisputed that the costs of technology upgrades required for

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[4]For additional support for this version of stand-alone pricing, reasoning along the same line, see Harrold and Strock, pp. 71-2, favorably quoting from an NTIA study; Egan, (1987), pp. 487-8; Egan, (1988), p. 22.

IBN are substantial. It also is uncontroverted that the required investment will be joint in nature . The new technology will serve both new and traditional lines of business. Traditional service would have been continued in business-as-usual fashion in the absence of the upgrades. Much of the plant presently employed has remaining useful years of life. On the other hand, there is the strong possibility that both cost and quality of service stands to benefit by the deployment of state-of-the-art equipment. Even if it is ceded that the total benefits flowing from the investment exceed total costs, the problem of the appropriate division of costs remains.

In light of the sizable technology upgrade that is signified by IBN, and that raises anew the issue of stranded investment, the question of the allocation of depreciation costs is of particular significance. The FCC is at great pains to point out in its price-cap notice that under this policy depreciation is not to be eligable for exogenous cost treatment. The FCC takes this position because it views depreciation as a cost not totally beyond the control of a carrier. However, rates to which the FCC price cap index (PCI) is to be applied will reflect, at the outset, current high levels of depreciation rates and accelerated schedules. Moreover, the FCC price cap plan is only one piece in the mosaic. State treatment of the issue will consitute a significant component of total depreciation practices. There is no reason to assume that price-cap plans adopted by the states will follow in all essential details the FCC model. Telephone providers, of course, traditionally have claimed and been granted the right to full capital recovery; all suggestions to the contrary vigorously and consistently have been defended against as

confiscatory and even unconstitutional. To date there has been no indication that carriers are prepared to waive this traditional prerogative, even in a price cap milieu. Future treatment of depreciation warrants continued and careful attention.

Advocates of the replacement in demand-inelastic markets of rate-of-return regulation with price-capping advance it in terms of its technical superiority, rather than its ability to advance particular strategic goals. In fact and instead, it is the latter that is its strong suit. The ability to achieve strategic ends is embedded in particular details of price cap plans as well as its general direction and thrust. Provisions capable of utilization to strategic advantage include the following:

Service bundling. The primary features of all price-cap proposals are the inflation index and the associated productivity offset. A focus upon this mechanism leaves out of account the basis for the initial rate to which the index will be applied.

Current price-cap proposals divide services into a number of "baskets" or categories. The ability to discriminate within and between markets is related to the nature and extent of the bundling. This will no doubt vary among specific plans. The more encompassing the service bundling, the greater the ability to discriminate.

In the case of the FCC price-indexing plan, the inclusion of both the private line and switched services of high volume customers in one basket affords AT&T a certain maneuverability, as does the combining of the service of residential and small business users. By way of illustration, in the latter case the application of a higher index to evening or daytime rates even while adhering to cap limits for the basket would advantage one

group at the expense of the other.[5]

Initial rates. Moreover, indices are a means of determining rates of change. They are not points of departure. Many proponents of price-cap procedures, including even the most highly critical of traditional regulation, propose that we start from where we are (e.g. NTIA, Regulatory Alternatives Report, pp. 38-39), taking present rates as a point of departure. This seems a somewhat cavalier, if not a downright cynical, approach. It is not proposed as part of any of these plans that any past investment mistakes, redundancies or gold-plating be written off under the newly adopted processes. Indeed, they would continue to be included and depreciated, with current depreciation rates set at their highest historical levels for recovery of that redundant, obsolete and gold plated plant. Nor would a "used and useful" check any longer even be available for regulatory use (Trebing, pp. 14-15). The FCC relies upon AT&T's existing rates as "the most reasonable option for initially determining compliance with the price cap system." (Second Further Notice, p.212) It also notes its tentative conclusion to use "existing rates, developed under established rate of return procedures" as the basis of its LEC price caps. (Second Further Notice p. 374).

Among the most vehement criticisms of traditional regulation are those based upon inherent Averch-Johnson effects. The model now suggested to replace it takes as its point of departure rates that were established

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[5]The FCC takes recognition of the inherent possibilities by dividing the residential/small business basket into narrow service categories and holding night and evening authorized increases relative to the change in the cap to levels below those of other categories in the basket to meet the requirements of streamlined review (Second Further Notice, p. 182). The four percent increase permitted for night and evening residential rates after adjustment for the change in the index would still seem, however, to provide AT&T considerable leeway.

with reference to the base wrought by A-J, rate base padding to the contrary notwithstanding. On grounds of principle, this is inexplicable. For practical purposes, and to the extent that the criticism of traditional ratemaking is valid, it will result in an inflated basis for indexing.

Inflation factor. The index to which rate changes are tied will have important consequences. Indications are that it will bias price in an upward direction. Economy-wide indices, such as the Consumer Price Index, most often are proposed. The GNP-PI adopted by the FCC also is a general measure of inflation. Inflation rates for the economy at large have little relevance to underlying industry cost conditions, and even less to those of particular companies.

In fact, historically, rates of change in costs in the telephone industry have not kept pace with those for the general economy.[6] The additional economies of scale and scope that a digital, fiber, broadband network implies suggests that the trend to lower unit costs will be resumed, if not thwarted by an over-capacity created by multiple, duplicative networks.

The use of a general inflation index will result in rates of change in prices in the indexed markets substantially in excess of costs, and will

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[6]One recent study of the telephone industry found an overall long-term decreasing trend in telephone unit costs (in constant dollars) from 1950 to the 1980s. The cessation of this trend in the 1980s is attributed to the substantial increase in depreciation expense in 1982 and the expense attributable to divestiture and conversion to equal access in 1984 (Chessler, pp. 47-56).

do so on a compounded basis.

Productivity adjustment. The FCC price cap model includes a productivity offset of three percent, comprised of an estimated two and one half percent future productivity increase and a one half percent consumer dividend. Indications are that this is low, perhaps extremely so. There is every reason to anticipate a positive and substantial productivity effect from anticipated technological advance alone.

AT&T Chairman Robert Allen notes:

> In AT&T's own factories, we've managed to raise productivity by 10 percent per year for the last three years. And we've done that by the disciplined application of information technology...
>
> Today's long haul fiber optic transmission systems will operate at 3.4 billion bits per second. But in our laboratories, we can send data more than five times faster than that. And we're only scratching the surface. Theoretically, we're only at one percent of the capability of fiber systems.
>
> Microchips now have two million electronic components. By the year 2000 we can expect they will have one billion. That's 500 times more power for the same cost. (p. 15, emphasis in original).

Even making due allowance for any hyperbole fathered by enthusiasm and company loyalty, the gap between estimates is sizable.

It is of relevance that the British Office of Telecommunications recently acknowledged that its initial productivity offset estimate of three percent for its price cap model was too low. It increased the adjustment to be used for British Telecom by 50 percent from three to four and one half percent. (Selwyn, July 1988 p. 4)

The application of a three percent productivity offset significantly will understate productive actualities, further biasing price in an upward direction.

Interpretations of each of these provisions and opinions about their implementation are bound to engender debate and controversy. Price-capping is advocated, in addition to its technical superiority, as a means to achieve administrative simplicity. Of all its claims, that is one that is least likely to be fulfilled.

Other, more diffuse effects of current policy proposals should be noted. The incentives that price-capping provides for cost-cutting is claimed as a primary benefit. But cost-cutting may result in harm, as well as benefit. To the extent that streamlining results in cutting into fat, say, bloated advertising budgets and executive compensation plans, it will have a salutary effect. The general policy also may be used as an excuse to cut into muscle, however. For example, if it were to result, in pressures on safety, health or hiring standards, effects also could be deleterious. The implementation of price capping could have serious quality of service consequences, a result of noneconomic cost shaving, as well as the erosion of talent and resources, and the shift of managerial interest and attention from traditional to new fields of endeavor.

Moreover, whereas profit levels in a price-cap environment are perceived to be constrained only by the ability of management to innovate and effect efficiencies, it should readily be apparent that there are actual political limits to profit rates for local telephone service. And if, for whatever reason (e.g. adoption of too high an inflation index, of too low a productivity estimate) profits in a price cap regime were to increase to politically unacceptable levels, there will exist the incentive to diversify further by increasing investment in deregulated fields, a movement that could give fresh meaning in a contemporary setting

to the Averch-Johnson effects of yore.[7]

Conclusion

IBN is a visionary concept. It could serve as a means substantially to broaden horizons and enrich lives. But, as with most change, its development carries with it the promise both of risk and reward. Their distribution will depend upon implementation strategies.

Technological change has both good and ill effects. Over the years it has afforded substantial benefits. It vastly has increased productivity. It has expanded standards of life, and life itself. It has broadened and deepened human potential in terms both of reach and grasp.

It is not self evident, however, and in fact may not be the case, that a particular market structure is the most, or the only one conducive to technological change, nor that technological change favors particular market forms. In current debate, technology is posited both as cause and effect of market structure. In fact, it may be neither. This is a complex topic, and not one that lends itself to simple answers. The assumption, however, that competitive markets (and even more particularly deregulated markets, whether competitive or not) create the optimal conditions for technological advance should be held to a higher standard of proof than that provided by blind faith and simple assertion.

Contemporary conventional wisdom has been shaped to a substantial, and not fully appreciated, extent by the current economic orthodoxy. The

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[7]Harry Trebing notes that: "The incentive to diversify is embedded in the structure of the markets served... [T]hese new patterns of cross-subsidization combine to form a theory of the partially regulated firm which is the legatee of the old Averch-Johnson effect." (p. 13)

policy prescriptions of that body of thought are guided by its vision of an ideal world, and a confusion of the ideal with the real. The policies currently in favor and proposed for future implementation for telecommunications are policies taken in the name and spirit of competition without regard to market realities.

Competition can be a powerful tool in relatively free markets. But deregulation should not be equated with competition. Many of the barriers to entry and exit that exist in telecommunications are economic. The simple act of removing legal barriers to entry and exit does not cause markets to become competitive. In markets with economic and technical conditions unfavorable to competition, deregulation will permit social to be replaced with private control.

Telecommunications markets are not now competitive. Local service markets remain for the most part monopolistic; long-distance markets at best are oligopolies containing one dominant and a few fringe suppliers.[8] Resale and the provision of enhanced services do not constitute competition for established carriers.

In any event, it is important to distinguish between the rivalry of established carriers with firms who must look to them as suppliers of facilities essential to their operation and those who need not. This is the distinction Judge Greene was attempting to draw when he removed the restriction on transmission of information services, and maintained that

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[8]A recent analysis of telecommunications markets that uses the concept of "minimum efficient market share" found monopoly to be the norm for intraexchange markets, "near monopoly" the norm for intralata private line and most intralata toll markets, and formidable barriers for new entrants even for interlata switched service markets and intralata switched service markets of major metropolitan areas (Selwyn, April 1988, pp 5-8; May 1988, pp. 6-9, esp. p. 8).

on the generation of information content.[8]

Niche suppliers are both dependent upon and vulnerable to the pricing policies of dominant firms in possession of bottleneck power. One question required to be resolved in any discussion of telco involvement in the provision of IBN is the relevance of that involvement to telephone company bottleneck control.

Structural and pricing reforms currently proposed for telecommunications contain incentives to allocate the costs of joint production disproportionately to the most vulnerable customer classes, and its benefits disproportionately to those with the most options. These incentives exist by virtue of the industry's technical conditions of production. They will not be reversed even if the network is formulated as a system of common carriage, with the attendant duty of "holding itself out;" and even if the conduit/content question is resolved in favor of the former. It will take a system of direct control with sufficient sophistication to recognize these tendencies, and with sufficient will to fashion and employ tools to prevent their operation. The need today is not for regulation to be eased; to the contrary, it requires strengthening. In a noncompetitive market free from social control, there will be no force for containment of anticompetitive tendencies.

The focus of orthodox economic theory is on efficiency in its

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[9] In Judge Greene's words: "[A]n entity that both generates and transmits information has a decisive advantage over those who merely collect and publish information and depend on the regional companies for its transmission. ...[The court] must ensure...that the regional companies will not engage in activities where the incentive and the ability for anticompetitive conduct are powerful" (p. 18).

individual productive and allocative sense. Social efficiency is seen simply as additive; as the sum total of efficiencies achieved by individuals in the economy. The classic orthodox economic definition of efficiency is that of Pareto optimality, sometimes elaborated by means of the application of the Kaldor-Hicks Compensation Principle. But a focus upon changes that serve to "make someone better off while making no one worse off," (Pareto optimality) while conceptually titillating, lacks operational content, and even operational significance. It tends to be identified with any result perceived to be produced by the operation of free market forces. It is bereft of any concept of social efficiency; a sensibility to how the parts of the whole fit and hold together, of how they function together, of the functions for which they serve and of their effectiveness in providing a viable foundation for human action. The perspective ignores the importance of the physical and social infrastructure as foundation and support for individual action and as the means by which a society gains cohesion and coherence.

From the perspective of social efficiency, the telecommunications network of the past functioned reasonably well for the vast majority of telephone subscribers. Policies advocated today, in the name of regulatory reform, and that are suggested for extended application for the "network of the future" threaten that social efficiency. And nor would the ability of the winners to pay off the losers (Kaldor-Hicks), even if that compensation were to be effectuated (going beyond the requirements of Kaldor-Hicks) put right that social whole.

There is no method to determine before-the-fact if an investment in IBN will be financially profitable. The only criterion is that of the

market; by definition, an after-the-fact test. It is part of our economic mythology that the competitive system joins risk and reward; that economic performance is driven by the actions of risk-taking, innovating entrepreneurs who examine alternatives and act on expectations. It is maintained, in fact, that that is what makes our system "work." The results both of failed and successful expectations are to be borne by owners, i.e. stockholders, and not by a body of captive ratepayers.

IBN not only is a visionary, it also is a risky endeavor. That risk should be borne by the carriers of the vision. It is only through the application of scrupulous cost-allocation procedures, unlikely in the absence of knowledgeable and tough regulation, that cross-subsidization of the new services by captive ratepayers will be avoided. This is not to suggest that past regulatory practice should be continued in perpetuity. What it does suggest is that regulatory reform must take on meanings that are novel in today's ideological climate; meanings other than, and in addition to, deregulation and passive regulation.

But, as Michael Botein points out (p. 20), regulation today is "declasse." And nor is this a comment with which, in good conscience, I find it possible to disagree. It also is true that regulation, to be successfully implemented, is dependent upon a social consensus about its legitimacy. It may be that it has become necessary, when it comes to industrial structure, for us continually to reinvent the wheel. We may be required to await a time when a sole focus upon deregulation, along with its associated excesses, itself becomes declasse, when economic regulation is recognized anew as one available option among many possible forms of market organization.

Market forces are powerful tools; where free, their operation will provide significant economic benefit. It is important that we recognize, however, that in certain key areas of the economy, market forces are not free, but constrained. The existence of market power foreshadows the ability to fetter market forces. Under the circumstances, in one way or another, these markets will be controlled; controlled socially in a public interest, or privately for personal gain.

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