

# FCC COMPETITION POLICY AND MARKETING'S INFORMATION TECHNOLOGY REVOLUTION

by

David E. M. Sappington\* and Donald K. Stockdale, Jr.\*\*

\* Professor of Economics, University of Florida, and former Chief Economist of the Federal Communications Commission.  
Department of Economics, P.O. Box 117140, Gainesville, FL 32611.  
(352) 392-3904 (voice); (352) 392-2111 (facsimile); sapping@ufl.edu.

\*\* Director of Research, Office of Plans and Policy, Federal Communications Commission.  
445 12<sup>th</sup> Street, S.W., Washington, D.C. 20554.  
(202) 418-1589 (voice); (202) 418-2807 (facsimile); dstockda@fcc.gov.

This article was written for the *Journal of Public Policy & Marketing's* Special Issue on "Marketing's Information Technology Revolution: Implications For Consumer Welfare and Economic Performance". The views expressed in this article are those of the authors, and do not necessarily reflect the views of the Federal Communications Commission or any of its Commissioners.

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## ABSTRACT

*The Federal Communications Commission's competition policy can affect the speed, scale, and scope of Marketing's information technology revolution. This article reviews key policy issues before the Commission, and describes related research projects. The key issues pertain to wireline competition policy, broadband policy, and spectrum policy.*

## **1. Introduction.**

The introduction, development, and widespread adoption of advanced communications technologies have helped to fuel the information technology revolution on which this special issue focuses. The development of the Internet, the growth of broadband capabilities, and advances in wireless communications have all contributed to the revolution.

Many factors influence the development and growth of communications technologies, including regulatory policy in the communications industry. Regulatory policy can affect the number and identity of firms that operate in the industry, the nature of their competitive interaction, their incentives to invest in new infrastructure and market new services, and the prices they charge for these services. Consequently, regulatory policy can affect the ultimate popularity and ubiquity of new communications services, and thus the depth and breadth of the information technology revolution.

The Federal Communications Commission (hereinafter the “FCC” or the “Commission”) plays a leading role in formulating regulatory policy in the United States’ communications industry. The FCC was established in 1934 for “the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States, ... a rapid, efficient, Nation-wide and world-wide wire and radio communication service with adequate facilities at reasonable charges ... .”<sup>i</sup> More recently, the Telecommunications Act of 1996 charged the Commission (and the state regulatory commissions) with the task of promoting competition and deregulation in all telecommunications markets. The Act also established the goal of encouraging “the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans ...,”<sup>ii</sup> where advanced telecommunications capability is defined as “high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.”<sup>iii</sup>

The purpose of this article is to review some of the major policy issues currently before the Commission, and to outline research projects that could help to inform the Commission’s policy

decisions.<sup>iv</sup> The discussion focuses on three general areas: wireline competition policy, broadband policy, and spectrum policy. Competition and industrial organization issues are central to all of these policies. Long-term industry performance, and thus the ultimate impact of the information technology revolution, depends critically upon the nature of the competitive interaction among suppliers of communications services. This competitive interaction, in turn, will likely be influenced greatly by several key policies currently under consideration at the Commission.

Section 2 of this article reviews pending Commission policies that are likely to affect significantly the scope and intensity of future competition among suppliers of wireline communications services. Section 3 provides a complementary review of pending Commission policies that will likely define the nature and extent of competition among providers of broadband Internet access and other broadband services. Section 4 explores Commission policies that will shape future competition among suppliers of wireless communications services and between suppliers of wireline and wireless services. Key research issues are identified in each of these sections. Concluding observations are presented in section 5.

## **2. Wireline Competition Policy.**

Many of the policy issues currently before the Commission originate with the Telecommunications Act of 1996 (hereinafter, the Act).<sup>v</sup> As noted above, the Act sought to promote competition and deregulation in all telecommunications markets. In passing the Act, Congress rejected the traditional view that the provision of local telecommunications service is a natural monopoly.<sup>vi</sup> Instead, Congress acted on the belief that competition among providers of local telecommunications services was the best way to sustain and promote the information technology revolution. Recognizing that competitive forces had fostered innovation and sustained technological progress in other industries for many years, Congress sought to harness the power of competitive forces in the communications industry by introducing meaningful competition into an industry that had historically relied heavily upon monopoly provision of key services.

Introducing competition into markets that historically have been regulated monopolies, however,

is seldom a simple task. And the introduction of competition into local telecommunications markets has been no exception. To understand some of the primary difficulties that have arisen, it is helpful to review some of the specific directives in the Act that were designed to foster the competitive supply of local telecommunications services, and the corresponding actions taken by the FCC.

The Act required the incumbent suppliers of local telecommunications services, often called incumbent local exchange carriers, or ILECs, to make their networks available for use by other carriers, including direct competitors. In particular, the Act mandated that ILECs provide to requesting carriers: (1) physical interconnection with their networks; (2) access to key network elements on an unbundled basis; (3) physical collocation of the equipment necessary for interconnection or access to network elements; and (4) for resale at wholesale rates any telecommunications service that the incumbent provides at retail to non-carrier customers.<sup>vii</sup>

The Act instructed the Commission to identify the specific network elements that ILECs must make available. The elements that the Commission required ILECs to unbundle included loops, switching (in most locations and for most customers), transmission facilities, and operations support system functions.<sup>viii</sup> Loops are the copper or fiber transmission facilities connecting a customer's premises with the local exchange carrier's central office switch. Switching is the functionality contained in local switches that, among other things, connects lines to lines, lines to trunks, and trunks to trunks, so as to permit calling parties to be connected to called parties. Transmission facilities connect the switches of the same carrier or different carriers. Operations support system functions encompass the ordering, provisioning, maintenance and repair of telephone lines and billing functions supported by an ILEC's data bases.<sup>ix</sup>

By imposing access and interconnection requirements, the Act intended to introduce at least three distinct means for new competitors to enter local telecommunications markets. First, a competitor might employ full facilities-based entry, whereby it builds its own telecommunications network and connects its network to the ILEC's network to ensure that the customers of each carrier

can communicate with the customers of the other carrier. Second, a competitor might employ partial facilities-based entry, constructing some of its own network (e.g., switches) and renting other components (e.g., loops) from the ILEC. Third, a competitor might pursue resale-based entry, whereby it purchases from the ILEC and then resells to customers key telecommunications services, such as local telephone service (including access to long-distance carriers) and basic vertical features, such as call forwarding and voice mail. In principle, a competitor might also pursue some combination of resale-based and facilities-based entry.

The ideal mix of these entry strategies constitutes an important issue for research. In particular, the short-term and long-term benefits of facilities-based and resale-based operations remain to be established. One potential advantage of facilities-based operation is that it generally enables a competitor to better differentiate its services from the services offered by incumbent suppliers than does resale-based operation. A competitor with its own facilities can offer new services not offered by the incumbent, or can bundle and price its services in a way that the incumbent does not.<sup>x</sup> In contrast, a competitor that simply resells the incumbent's services can offer only the same services that the incumbent offers.

Despite its potential merits, facilities-based entry can impose substantial risk on an entrant. The risk arises when the entrant is required to incur the full cost of building a network and making it fully operational before it receives any revenue from customers. This requirement can constitute a significant barrier to entry, particularly when a large operating scale is most economical and when an entrant faces considerable uncertainty about the number of customers it will ultimately be able to attract. Consequently, resale-based entry might provide a useful means for an entrant to learn more about market prospects and to attract customers initially as it embarks on a transition to pure facilities-based operations.

When resale constitutes a useful entry strategy but facilities-based competition is the long-term goal, it may be appropriate to create incentives for competitors to rely more heavily upon their own facilities as they gain more experience in the market. For example, a new entrant might be permitted

to access the network elements or resell the services of incumbent operators only for a limited period of time. Alternatively, the prices at which access is secured or wholesale services are purchased might rise over time. The effects of such policies on the incentives of incumbent suppliers to open their networks and otherwise comply with their statutory obligations merit consideration, as do the precise details of pricing and access policies that will best foster lasting, effective industry competition.

The rationale for allowing competitors to access the network of an incumbent supplier is apparent. Such access can enable new entrants to compete more effectively against incumbent suppliers, and thereby bring the benefits of increased competition and reduced regulation to consumers. There are two potential drawbacks to such access, however. First, the availability of unbundled network elements at attractive prices may reduce the incentives of competitors to invest in their own facilities. Second, the obligation to open its network to competitors may reduce the incentive of an incumbent supplier to invest in its own facilities. If the terms of access are such that an incumbent supplier anticipates little or no return from network investment, then the incumbent will not undertake the investment, to the potential detriment of consumers. Thus, a sensible network access policy must balance the potential benefits of increased industry competition against the potential costs of reduced network investment by incumbents and new competitors. The optimal manner in which to effect this balance is an important area for future research.

The FCC has two primary tools at its disposal to effect such a balance: identifying the specific network elements that ILECs are required to make available, and setting the guidelines that govern the prices the ILECs can charge for the elements. The general pricing rules that the Commission has adopted in this regard are known as TELRIC, which is the acronym for total element long run incremental cost. Under TELRIC, an ILEC must afford competitors access to key network elements at prices that reflect the long-run average incremental cost that an efficient carrier would incur to supply the elements, using the best available technology. This pricing policy attempts to replicate the prices that would tend to prevail if network elements were supplied competitively.<sup>xi</sup> Competition

among suppliers of network elements would tend to eliminate extranormal profit,<sup>xii</sup> thereby ensuring that in the long run, the price of an element did not exceed its average cost of production. Furthermore, prices would decline as new technologies emerge that reduce the costs of providing network elements.<sup>xiii</sup>

Critics argue that TELRIC prices provide insufficient incentive for ILECs to invest in their networks. Critics also argue that TELRIC prices discourage pure facilities-based entry by reducing to artificially low levels the cost of alternatives to pure facilities-based entry.<sup>xiv</sup> Opposition to the TELRIC pricing methodology led to several court challenges of the methodology, with the result that the Commission's pricing rules were vacated for several years. In May 2002, however, the Supreme Court affirmed the FCC's TELRIC pricing methodology.<sup>xv</sup> The FCC must now consider how, if at all, it should clarify and/or modify its general pricing rules. State regulatory commissions must also determine how to translate the FCC's general pricing methodology into detailed prices for network elements.<sup>xvi</sup> Many TELRIC pricing issues merit additional research. One such issue concerns the best method for calculating key components of an ILEC's costs, including the economic depreciation of its production facilities and its cost of capital.

In addition to requiring the FCC to establish a methodology for pricing network elements, the Act instructed the Commission to identify the network elements that ILECs must make available to competitors. Specifically, the Act states that, in determining which network elements must be made available, "the Commission shall consider, at a minimum, whether – (A) access to such network elements as are proprietary in nature is necessary; and (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier to provide the services that it seeks to offer."<sup>xvii</sup> As noted above, the Commission's current implementation of these standards requires ILECs to make available to competitors, among other things, loops, transmission facilities, operations support system functions, and, for most customer types in most locations, switching.

In December 2001, the Commission issued a Notice of Proposed Rulemaking ("NPRM")

initiating its first triennial review of its policies on unbundled network elements.<sup>xviii</sup> The NPRM identified a number of key research issues regarding the general design of unbundling rules to encourage facilities-based competition and the specific network elements that should be unbundled. These issues include the appropriate interpretation of the statutory terms “necessary” and “impair” and how to determine whether a competitor would be impaired if it were denied access to a particular network element.

Research is also warranted on the merits of rules that differ according to the geographic region or customer group that a requesting carrier seeks to serve and/or the specific services that it seeks to offer. In certain areas, both an ILEC and other providers may supply some network elements. Different unbundling requirements may be appropriate when firms compete to supply key network elements. Unbundling requirements might also vary according to the type of customer being served. To illustrate, certain large customers might be amenable to long-term contracts, which can reduce the uncertainty and customer churn that an entrant faces. In addition, the steady stream of revenue derived from serving certain large customers may be sufficient to offset the substantial investment required to serve these customers via facilities-based operations. Additional research would be useful to help determine the minimum number of customers of different types that generally will provide the revenue streams that make facilities-based competition viable for an entrant. Research that examines the impact of prevailing retail rate levels and rate structures (particularly implicit subsidies, which often benefit particular customer classes or specific geographic areas) on the profitability of different entry strategies for new competitors also would be valuable.

By mandating that ILECs open their networks to competitors, the Act compels the ILECs to deliver to competitors the very inputs they need to attract an ILEC’s customers, which may well reduce the ILEC’s profit. Therefore, the Act creates strong incentives for ILECs to try to limit or delay competitors’ access to their networks. ILECs might do so, for example, by delaying negotiations over the terms and conditions for access. ILECs might also delay the implementation of an access agreement once it is signed. And ILECs might understate the space available in their

central office to accommodate competitors' interconnection equipment, or make it difficult for competitors' technicians to install the requisite interconnection equipment in ILEC facilities.

Activities of this sort can be difficult to detect and attribute unambiguously to willful attempts to circumvent the directives of the Act. One way to help assess whether an ILEC is intentionally hindering the access of competitors to its network is to compare the ILEC's performance on key access activities to established benchmarks, to the performance of other ILECs, and/or to the ILEC's corresponding performance in providing service to its own customers. The Commission has issued two NPRMs to help assess the relative merits of these and alternative approaches.<sup>xix</sup> Many important research questions remain to be addressed. For example: (1) What are the relevant performance dimensions that might be monitored? (2) Should all relevant performance dimensions be monitored, or can attention reasonably be restricted to a few key dimensions? (3) What statistical tests should be employed to assess whether an ILEC is intentionally disadvantaging competitors? and (4) Should state regulators be encouraged to design their own performance standards and associated reward and penalty schedules, or should a uniform national policy be implemented?

Performance metrics of this sort are just one of many possible competitive safeguards. Competitive safeguards encompass a range of regulations that are designed to limit the ability of a vertically integrated supplier of an essential input to disadvantage rival providers of retail services. At least in principle, a vertically integrated firm that controls an essential input (e.g., network access) and participates in a downstream market (e.g., the provision of telephony services) might use its power in the input market to disadvantage rivals in the downstream market. For example, the vertically integrated firm might make it particularly difficult for downstream rivals to secure high-quality, reliable network access in a timely fashion. By doing so, the vertically integrated firm might help to ensure that it fares well against competitors in its retail operations.

Certain competitive safeguards, like performance metrics, are non-structural in that they do not regulate the fundamental operating structure of the carrier. Competitive safeguards also can be structural, however. For example, a vertically integrated supplier might be required to establish

separate corporate subsidiaries to provide wholesale (input) services on the one hand and retail services on the other. The retail subsidiary might also be required to purchase the services of the wholesale subsidiary on the same terms and conditions that competing retailers do. In addition, the wholesale and retail subsidiaries might be prohibited from jointly owning key production facilities. The optimal use of structural safeguards of this sort to limit harms to competition without sacrificing unduly the economies of scope that can arise from the simultaneous provision of wholesale and retail services merits additional research.<sup>xx</sup> Further research regarding the optimal combination of structural and non-structural safeguards also would be useful.

### **3. Broadband Policy.**

Broadband services in general, and broadband Internet access in particular, promise to be integral components of any ongoing information technology revolution. The Commission defines broadband Internet access as a service that “enables consumers to communicate over the Internet at speeds that are many times faster than the [56 kbps]<sup>xxi</sup> speeds offered through dial-up telephone connections.”<sup>xxii</sup> Among other things, broadband Internet access enables consumers to view high-quality full-motion video. Consequently, compared to narrowband dial-up access, broadband Internet access allows a wide range of new products and services to be delivered over the Internet.

As noted in the introduction, the FCC is charged with encouraging “the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans.”<sup>xxiii</sup> The optimal manner in which to do so is an important matter currently before the Commission. Michael Powell, the Chairman of the FCC, has stated that “The widespread deployment of broadband infrastructure has become the central communications policy objective today.”<sup>xxiv</sup> Chairman Powell (2001) has also stated that broadband service providers should operate in a “minimally regulated” space. The critical task before the Commission is to specify precisely the minimal regulations needed to ensure that advanced telecommunications capability is available to all Americans “on a reasonable and timely basis”.

The Chairman’s preference for minimal regulation stems in part from the fact that many

consumers currently have a choice among broadband service providers. Consequently, at least in principle, competition among providers could limit or perhaps even eliminate the need for regulatory intervention. Most subscribers presently obtain broadband Internet access from cable operators (via cable modem) and from wireline telecommunications firms (via DSL).<sup>xxv</sup> Wireless and satellite operators also provide broadband Internet access, but their market penetration has been relatively limited to date.<sup>xxvi</sup> Cable modem service is available to more than two-thirds of U.S. households and DSL service is available to more than half.<sup>xxvii</sup> More than 80% of U.S. households have access to either cable modem or DSL service or both today, and nearly 95% are predicted to have access to some form of broadband Internet access by 2005.<sup>xxviii</sup>

To help determine how to best encourage ongoing and even more widespread deployment of broadband infrastructure, the Commission has initiated three important proceedings. The first proceeding, which we refer to as the Broadband Dominance proceeding, addresses the appropriate regulatory treatment of ILECs that provide broadband telecommunications services.<sup>xxix</sup> The second proceeding, which we call the Broadband Regulatory Framework proceeding,<sup>xxx</sup> concerns the appropriate statutory classification of and the best regulatory framework for broadband Internet access services provided by telecommunications carriers.<sup>xxxi</sup> The third proceeding, which we refer to as the Cable Broadband proceeding, examines the regulations, if any, that should be imposed on the other major providers of broadband Internet access – cable operators.<sup>xxxii</sup>

The Broadband Dominance proceeding concerns the proper classification of ILECs with regard to their provision of broadband telecommunications services. Currently, ILECs generally are treated as *dominant* carriers in the provision of local exchange and exchange access services, including broadband services. Under the Commission's rules, a dominant carrier – one that possesses individual market power – generally faces stricter regulatory requirements than does a non-dominant carrier. For example, the services of dominant carriers typically are subject to rate regulation, and dominant carriers often must demonstrate that the prices they propose to charge reflect corresponding production costs. In addition, structural and non-structural competitive safeguards

may be imposed on dominant carriers. As noted in section 2, structural safeguards include the requirement of separate wholesale and retail subsidiaries and limits on the ability of the subsidiaries to jointly own key production facilities. As explained in section 2, structural safeguards (and non-structural competitive safeguards such as performance metrics and the requirement that wholesale and retail operations keep separate books of account) help to limit the ability of dominant carriers to employ the market power they enjoy in one market to secure a competitive advantage in another market (by, for example, limiting the access of retail competitors to essential inputs). Structural and non-structural competitive safeguards can also limit the ability of dominant carriers to shift accounting costs from unregulated to regulated activities in an attempt to secure higher prices for rate-regulated services.<sup>xxxiii</sup>

In the Broadband Dominance proceeding, the Commission seeks to determine: (1) the relevant product and geographic markets for broadband services (such as high-speed data lines provided to large businesses), which must be defined in order to assess whether a firm possesses market power in the provision of broadband services; (2) whether ILECs possess individual market power in the relevant product and geographic markets; and (3) what, if any, competitive safeguards are appropriate to limit the ability of ILECs to disadvantage competing providers of broadband services.

As noted above, in its Broadband Regulatory Framework proceeding, the Commission seeks in part to determine the appropriate statutory classification of broadband Internet access services provided by telecommunications carriers. The Act distinguishes between “information services” and “telecommunications services.”<sup>xxxiv</sup> The latter are subject to the (generally more stringent) provisions of Title II of the Communications Act which govern common carriers,<sup>xxxv</sup> while the former may be subject only to the Commission’s general regulatory authority under Title I.<sup>xxxvi</sup> The Commission is in the process of determining: (1) whether broadband Internet access provided by a telecommunications carrier should be classified as an information service or a telecommunications service; (2) the appropriate regulatory framework for this service; and (3) the nature of any competitive safeguards that should be imposed on telecommunications carriers that provide

broadband Internet access.

A central issue in the Broadband Regulatory Framework proceeding is whether competing suppliers of broadband Internet access should be afforded access to the networks of incumbent suppliers under regulated terms and conditions. A key tradeoff here is precisely the tradeoff that arises in the design of competition policy for suppliers of wireline telecommunications services: although mandated network access may promote price and service quality competition once broadband infrastructure is deployed, mandated access on terms that incumbent providers find restrictive can reduce their incentive to deploy broadband infrastructure. The ability to access the network of an incumbent supplier on favorable terms may also limit the incentives of competitors to invest in their own broadband facilities.<sup>xxxvii</sup> Consequently, although mandated access may increase competition for any given configuration of broadband facilities, it may discourage investment in new and enhanced facilities.

This important issue is also present in the Cable Broadband proceeding. The Commission has determined that “cable modem service, as it is currently offered, is properly classified as an interstate information service, not as a cable service, and that there is no separate offering of a telecommunications service.”<sup>xxxviii</sup> The Commission is in the process of formulating the policy implications of this determination. In particular, the Commission is considering the “open access” issue, which is the issue of whether cable operators should be required to offer their cable modem customers a choice among information service providers (“ISPs”).

The open access issue raises many important questions. For example, if open access requirements are appropriate, what specific regulations should be imposed on cable operators? Should the fees that a cable operator charges an ISP for the use of the operator’s network be regulated? If so, how? And how, if at all, should the level of service quality that cable operators deliver to ISPs be regulated? For example, should cable operators be permitted to restrict the content that ISPs deliver to customers?<sup>xxxix</sup> Furthermore, is it appropriate to require a cable operator to deliver to all independent ISPs on the same terms and conditions the services that it provides to its

own ISP (division)? If so, how would the requirement be implemented, monitored, and enforced?

Of course, any regulation of cable modem service that is contemplated cannot be analyzed in isolation. Regulations that are imposed on cable operators can affect their competitive interaction with ILECs and other providers of broadband Internet access, just as regulations imposed on ILECs can affect their ability and incentive to compete with cable operators and other suppliers of broadband Internet access. Thus, all three of the Commission's broadband proceedings are intimately intertwined.

In formulating its broadband policies, the Commission will likely consider whether regulations should vary by geographic region or customer type. To illustrate, cross-platform competition may be sufficiently intense for residential customers in some densely-populated regions that little or no regulation is needed. In contrast, some regulation may be appropriate in less-densely-populated regions that are served primarily or exclusively by a single broadband platform. Financial incentives to provide broadband services in geographic regions where the costs of deploying the service are particularly high and the expected revenue from the deployment is low may also warrant consideration.

Chairman Powell's stated focus on the widespread *deployment* of broadband infrastructure highlights an important distinction between deployment and subscription. Even if broadband capability is deployed ubiquitously, consumers may choose not to subscribe to broadband Internet access services.<sup>xl</sup> High prices, a lack of compelling broadband applications, and/or general satisfaction with traditional dial-up Internet access may limit consumer demand for broadband Internet access. Of course, anticipated consumer demand can affect deployment decisions. Therefore, actions that stimulate consumer demand for broadband services may lead to increased broadband deployment. Thus, deployment and subscription issues are likely to be inextricably linked. Additional research regarding the broadband services (e.g., the delivery of digital video content)<sup>xli</sup> that would substantially increase consumer demand for broadband Internet access and thereby induce more rapid and ubiquitous deployment of broadband infrastructure would be useful.

#### **4. Spectrum Policy.**

The development and widespread adoption of wireless communications services has also contributed to the information technology revolution in recent years. Mobile telephony subscribership in the United States has been increasing at double-digit rates for more than a decade now. Today, nearly half of the U.S. population owns a mobile phone, and mobile phone use is even more ubiquitous in other countries.<sup>xliii</sup> In some developing countries where the wireline communications structure is limited, wireless communication is becoming the primary means of communication.

Wireless communications services admit a wide range of new products and services. Wireless telephones permit constant communication over vast geographic regions whether the communicators are stationary or mobile. Wireless computer networks permit direct access to broadband services even when a wireline connection to a high-speed cable or telephone line is not available. And wireless devices permit the remote operation of a variety of household and industrial appliances.

The spectrum over which wireless communications travel is a public resource that is managed by the FCC and the National Telecommunications Information Administration (NTIA). The FCC determines and oversees the use of spectrum by the private sector and by state and local governments. The NTIA oversees spectrum use by federal users, such as the Department of Defense. The spectrum that is particularly valuable for mobile communications services is the spectrum in the 300 MHz to 3,000 MHz range. The FCC has exclusive jurisdiction over approximately 37 percent of this spectrum.<sup>xliiii</sup> Therefore, the extent to which firms can develop and deploy innovative wireless communications services will depend to a significant degree on the spectrum policies adopted by the FCC.

Historically, the FCC has allocated most spectrum to specific uses (e.g., broadcast television or cellular telephony) and assigned the spectrum to specific users. Chairman Powell (2001) has noted that “It is important that the Commission move from its traditional spectrum management paradigm of “command and control” to a paradigm of market-oriented allocation policy to provide more

flexible allocations that allow multiple uses so that spectrum can be put to its highest and best use.” A central issue in spectrum policy today is how best to make this transition.<sup>xliv</sup>

In recent years, the Commission has made some progress replacing the administrative allocation of spectrum with market mechanisms. The Commission now auctions (rather than assigns) licenses for most of the spectrum that it designates for exclusive use by the licensee.<sup>xlv</sup> The Commission also has begun to permit flexible use of some of the spectrum that it has licensed. However, additional steps must be taken if spectrum allocation and use are to be determined primarily by market forces rather than by regulatory fiat.

Kwerel and Williams (2002) have proposed one such step. The authors recommend a large-scale auction of major blocks of the spectrum. Under the authors’ proposal, the FCC would place in the auction all relevant unassigned spectrum. Current licensees would also put their assigned spectrum up for bid. All spectrum that is placed in the auction would be afforded flexible use. The authors further propose that each current licensee receive the full amount of the winning bid for its license. Consequently, current licensees who wish to retain, rather than sell, their licenses can do so simply by placing the highest bid for their licenses.<sup>xlvi</sup>

A key feature of this proposed auction is that it would afford all potential licensees the opportunity to bid simultaneously on any and all segments of the relevant spectrum. The auction would also enable current licensees to offer their licenses for sale simultaneously to many potential buyers. By facilitating the coordinated, simultaneous interaction of all potential buyers and sellers of all available spectrum licenses, an auction of this sort could help to ensure that the spectrum is quickly deployed to its highest-value use.

This proposal raises several important questions, including: (1) How much spectrum should be designated for exclusive use by licensees and how much should be reserved for non-exclusive use by all eligible users? (2) What limits should be placed on activities that employ spectrum designated for non-exclusive use in order to limit harmful interference among spectrum users? (3) What corresponding rights and obligations should be imposed on licensees of spectrum that is assigned for

exclusive use? (4) After market trading of spectrum licenses is established, what ongoing role, if any, should the FCC or other regulatory body play in ensuring the proper functioning of the market for spectrum licenses?

Regardless of how the ownership of spectrum licenses is ultimately determined, some limits on ownership may be necessary to promote competition among firms that employ spectrum as an essential input. Historically, competition among suppliers of wireless telephony services has been governed primarily by a “spectrum cap”.<sup>xlvii</sup> The spectrum cap limited to approximately one quarter the fraction of the spectrum used to deliver mobile telephony services that could be licensed to a single firm in each relevant market. The spectrum cap served two useful purposes. First, it ensured that no firm could monopolize an essential input (spectrum). Second, it provided certainty to firms that participated in auctions of spectrum licenses, allowing them to determine before they bid whether they would be permitted to retain any spectrum licenses that they won in the auctions.

Despite these attributes of the spectrum cap, the cap did not consider explicitly a variety of factors that might have affected whether additional concentration of spectrum licenses served the public interest.<sup>xlviii</sup> These factors include the number of firms competing in the relevant market, the nature and intensity of their competition, barriers to entry faced by new competitors, and customer demand for mobile telephony services relative to the available (spectrum) capacity.

Recognizing this shortcoming of the spectrum cap, the Commission decided to eliminate the cap as of January 1, 2003.<sup>xlix</sup> The task before the Commission now is to develop and implement any guidelines that it might decide to employ in place of the cap. A key function of any public guidelines would be to inform industry participants about the framework that will underlie the Commission’s case-by-case review of proposed spectrum license transfers. The optimal formulation of guidelines of this sort remains an important issue for future research. Among the questions that require answers are: (1) On what indicators of firm and industry activity (e.g., spectrum concentration, output market shares, etc.) should guidelines be based? (2) Should guidelines specify “safe harbor” conditions which, if satisfied, ensure the approval of the proposed spectrum license transfer? (3) Should the

proposed transfer of a spectrum license to a firm that supplies both wireline and wireless communications services be treated differently from a corresponding transfer to a firm that supplies only wireless services? and (4) In what manner, and how frequently, should guidelines change over time as industry conditions change?

## **5. Conclusions.**

This article has reviewed some of the major competition policy issues currently before the FCC that promise to affect the ultimate breadth and depth of Marketing's information technology revolution. The discussion has focused on the policies that will govern competitive interactions among wireline telecommunications suppliers, wireless telecommunications suppliers, and cable operators, all of which are key players in the information technology revolution.

In closing, we note that FCC decisions regarding license transfer applications also influence the competitive conditions faced by suppliers of communications services. To illustrate, consider the FCC's recent decision regarding another set of players in the information technology revolution: the suppliers of Direct Broadcast Satellite (DBS) multichannel video services. Presently, there are two primary providers of nationwide DBS services – EchoStar and DirecTV. In late 2001, EchoStar proposed to acquire DirecTV. FCC approval was required to effect the acquisition because it involved the transfer of spectrum licenses issued by the Commission. EchoStar and DirecTV argued that their union would permit them to employ their spectrum more efficiently, compete more effectively against cable operators, and achieve the scale required to render profitable the delivery of broadband Internet access to residential customers. Opponents of the merger argued that the merger would eliminate vibrant competition between EchoStar and DirecTV. They also pointed out that many U.S. households are not served by any cable operator, and so the proposed merger would have left these households facing a single supplier of multichannel video services. DirecTV and EchoStar promised that if their merger were approved, they would set the same price for their programming services in all jurisdictions throughout the nation, so that even households that were not served by cable operators would benefit from the competition between DBS and cable operators in other

geographic regions.

The FCC was unable to find that the proposed merger was in the public interest, and accordingly designated it for hearing in October 2002.<sup>1</sup> In his Separate Statement, Chairman Powell remarked that “The combination of EchoStar and DirecTV would have us replace a vibrant competitive market with a regulated monopoly. This flies in the face of three decades of communications policy that has sought ways to eliminate the need for regulation by fostering greater competition.”<sup>li</sup> As Chairman Powell’s statement indicates, mergers of this type raise important questions about the extent to which reductions in intra-modal competition (e.g., competition among DBS operators) are reasonably tolerated in order to enhance inter-modal competition (e.g., competition between DBS operators and cable operators). This particular merger also points out the need for a deeper understanding of the market outcomes that are likely to result when one firm sets a uniform national price for its service while facing different levels of competition and different competitors in various parts of the nation.<sup>lii</sup> These and related issues await further research, as Marketing’s information technology revolution continues.



## FOOTNOTES

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- i. 47 U.S.C. § 1.
  - ii. 47 U.S.C. § 706 (a).
  - iii. 47 U.S.C. § 706 (c) (1).
  - iv. Portions of this article draw from the discussion in Kwerel et al. (2002). The important contributions of our coauthors and Commission colleagues are gratefully acknowledged.
  - v. Pub. L. No. 104-104, 110 Stat. 56 (codified at 47 U.S.C. §§ 151 *et seq.*).
  - vi. Loosely speaking, a natural monopoly occurs when unit production costs decline as the scale of operation increases. See Sharkey (1982, pp. 20-24).
  - vii. 47 U.S.C. § 251 (c).
  - viii. *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, Third Report and Order and Fourth Further Notice of Proposed Rulemaking, 15 FCC Rcd 3696 (1999).
  - ix. The FCC mandated that when an ILEC provides access to a network element, it must provide access to all of the element's features, functions, and capabilities. To illustrate, when a carrier requests access to unbundled local switching, the ILEC must provide the carrier with access to all the features and functions of the switch, including all vertical features (such as caller identification, call forwarding, and voice mail).
  - x. For example, a competitor might bundle high-speed Internet access service with local telephone service. Alternatively, it might include some vertical features, such as caller identification or call waiting, in the basic price for local telephone service.
  - xi. See Sharkey (1999), Kennet and Perez-Reyes (2002), or Rosston and Noll (2002), for example.
  - xii. Extranormal profit from an operation is profit in excess of the minimum required to ensure the operation takes place.

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- xiii. *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, 15 FCC Rcd 3696 (1999).
- xiv. Hausman (1999), Kahn et al. (1999), Mandy (2002), and Weisman (2002), among others, provide critiques of the TELRIC pricing methodology.
- xv. *Verizon Communications Inc. v. FCC*, 122 S.Ct. 1646 (2002). This Supreme Court decision reversed an earlier decision by an intermediate appellate court that had vacated the FCC's pricing rules (*Iowa Utilities Bd. v. FCC*, 219 F.3d 744 (8<sup>th</sup> Cir. 2000)).
- xvi. The Act specifies that, when a requesting carrier and an ILEC cannot agree on the terms of an interconnection agreement, state regulators, and not the FCC, should set the actual terms and conditions for interconnection. If the state regulator fails to act, however, the parties may appeal to the FCC, which must then mediate or arbitrate the interconnection dispute (47 U.S.C. § 252 (b)(1) & (e)(5)). The FCC currently is arbitrating a dispute between Verizon Virginia and both AT&T and WorldCom regarding prices for unbundled network elements in Virginia. The arbitration procedure will require the FCC to make decisions about several important detailed pricing issues that it had not addressed explicitly before. *See, e.g., Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration*, Memorandum Opinion and Order, CC Docket No.00-218 (released Jul. 17, 2002).
- xvii. 47 U.S.C. § 251(d)(2).
- xviii. *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Notice of Proposed Rulemaking, CC Docket No. 01-338, FCC 01-361 (rel. Dec. 20, 2001). NPRMs advise interested parties about key policy issues that the Commission is considering, and invites written comment on particular policy proposals.
- xix. *Performance Measurements and Standards for Unbundled Network Elements and Interconnection*, Notice of Proposed Rulemaking, CC Docket No. 01-318, FCC 01-331 (rel.

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- Nov. 19, 2001); *Performance Measurements and Standards for Interstate Special Access Services*, Notice of Proposed Rulemaking, CC Docket No. 01-321, FCC 01-339 (rel. Nov. 19, 2001).
- xx. Economies of scope exist when a single firm can produce a set of products more cheaply than can separate firms. (See Sharkey, 1982, p. 7.) The FCC has issued an NPRM to consider the design of structural safeguards (*2000 Biennial Regulatory Review*, Notice of Proposed Rulemaking, CC Docket No. 00-175, FCC 01-261 (rel. Sept. 14, 2001)).
21. “kbps” denotes kilobits per second.
22. *Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations by Time Warner Inc. and America Online, Inc., Transferors, to AOL Time Warner Inc., Transferee*. Docket No. 00-30, Memorandum Opinion and Order, 16 FCC Rcd 6547, 6572 ¶ 64, 6574-77 ¶¶ 69-73 (2001).
- xxiii. 47 U.S.C. § 706 (a).
- xxiv. Powell (2001).
- xxv. “DSL” refers to digital subscriber line.
- xxvi. See McKinsey&Company and J.P. Morgan H&Q (2001), for example.
- xxvii. See, for example, Bilotti et al. (2001), McKinsey&Company and J.P. Morgan H&Q (2001), and National Cable & Telecommunications Association (2002).
- xxviii. See McKinsey&Company and J.P. Morgan H&Q (2001, pp. 43, 52).
- xxix. *Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services*, Notice of Proposed Rulemaking, 01-337, FCC 01-360 (rel. Dec. 20, 2001).
- xxx. *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Notice of Proposed Rulemaking, CC Docket No. 02-33 (released Feb. 15, 2002).
- xxxi. The Commission has defined “Internet access services” as services that “alter the format of information through computer processing applications such as protocol conversion and

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- interaction with stored data.” Report to Congress, 13 FCC Rcd 11501, 11516-17 (1998) (citations and quotations omitted).
- xxxii. *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, GN Docket No. 00-185 and CS Docket No. 02-52, March 15, 2002.
- xxxiii. Such cost shifting may secure higher regulated prices when prices are set to reflect the measured costs of producing regulated services. See, for example, Braeutigam and Panzar (1989).
- xxxiv. An “information service” is “the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.” A “telecommunications service” is “the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available to the public, regardless of facilities used.” 47 U.S.C. §§ 153(20), 153(46).
- xxxv. 47 U.S.C. §§ 201-276.
- xxxvi. 47 U.S.C. §§ 151-161.
- xxxvii. On the other hand, the ability to access certain components of an incumbent’s network (e.g., loops) may encourage a broadband competitor to deploy other network components (e.g., digital subscriber line access multipliers) of its own.
- xxxviii. *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, GN Docket No. 00-185 and CS Docket No. 02-52, March 15, 2002, ¶ 7.
- xxxix. Cable operators may wish to impose content restrictions in order to prevent a single customer from using a disproportionate share of the available network capacity. Cable operators may also wish to impose restrictions on video content delivered over the Internet in order to preserve customer demand for cable video services.

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- xl. Although more than 80% of U.S. households could subscribe to broadband Internet access, only 12% do (Horrigan, 2002).
- xli. The relatively limited amount of video content that is readily available via the Internet may be one factor that is limiting consumer demand for broadband Internet access. The limited content stems in part from the concerns of movie producers and recording companies regarding piracy of digital content delivered over the Internet. If these concerns can be alleviated, video producers and owners may authorize expanded Internet delivery of their content, which, in turn, may stimulate broadband demand and deployment.
- xlii. Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, *Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, Fourth Report, FCC 02-179 (rel. Jul. 3, 2002), pp. 5, C-2 ([http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-02-179A2.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-02-179A2.pdf)).
- xliii. See Kwerel and Williams (2002) for a detailed discussion of the division of spectrum in the 300 – 3,000 MHz range. (“MHz” is the abbreviation for “megahertz”).
- xliv. Chairman Powell (2002) has identified four key elements of future spectrum policy: (1) promoting more efficient use of spectrum; (2) shifting from a “command and control” model of regulation to market based mechanisms; (3) reconciling critical government uses of spectrum with commercial uses; and (4) fostering innovation.
- xlv. See McAfee and McMillan (1996), for example, for reviews of the FCC spectrum auctions.
- xlvi. Kwerel and Williams (2002) suggest that current spectrum licensees be denied flexible use of their spectrum for a period of time if they choose not to put their spectrum licenses up for sale in the large-scale auction. This suggestion is designed to overcome agency problems within firms, whereby a firm’s spectrum license manager might prefer that his/her firm retain its current spectrum licenses (and thus the manager’s job), even though the licenses could be sold for far more than they are worth to the firm.
- xlvii. *Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment*

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*of Mobile Services*, Third Report and Order, 9 FCC Rcd 7988 (1994).

- xlvi. In order to approve a proposed transfer of a spectrum license from one firm to another, the Commission must find that the transfer serves the “public interest, convenience, and necessity” (47 U.S.C. § 310(d)). The Commission’s public interest review of license transfers encompasses many elements, including the likely effects of the transfer on competition, innovation, service quality, national security, and universal service.
- xlix. *2000 Biennial Regulatory Review, Spectrum Aggregation Limits For Commercial Mobile Radio Services*, Report and Order, FCC 01-328 (December 18, 2001).
  - 1. *Application of EchoStar Communications Corporation (EchoStar); General Motors Corporation and Hughes Electronics Corporation (DirecTV)*, Hearing Designation Order, CS Docket No. 01-348 (October 9, 2002).
  - li. *Id.*, Separate Statement of Chairman Michael K. Powell, at 1.
  - lii. DeGraba (1987) provides one useful analysis this issue.