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COMMISSION AUTHORIZED

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Reexamination of the Effective	)	
Competition Standard for the	)	**MM Docket No. 90-4**
Regulation of Cable Television	)	
Basic Service Rates	)	

Comment of the Staff of
the Bureau of Economics and
the San Francisco Regional Office
of the Federal Trade Commission

April 24, 1991

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* This comment represents the views of the staff of the Bureau of Economics and the San Francisco Regional Office of the Federal Trade Commission. They are not necessarily the views of the Commission or those of any individual Commissioner. Inquiries regarding this comment should be directed to Michael Vita (202-326-3493) of the FTC's Bureau of Economics or John Wiegand (415-744-7920) of the FTC's San Francisco Regional Office.

Table of Contents

Executive Summary

The Cable Communications Policy Act of 1984 ("Cable Act") allows local cable franchising authorities to regulate rates for "basic cable service" only when the cable system does not face "effective competition" for basic service. "Basic cable service" is defined by statute to consist of any tier of service that includes the "retransmission of local television broadcast signals." Service tiers that do not include local television signals cannot be regulated by the franchising authority.

The Cable Act delegated to the Federal Communications Commission ("FCC") responsibility for defining the circumstances under which "effective competition" for basic service could be said to exist for the purposes of the enforcement of the Act. Under the existing standard, basic service is said to be subject to "effective competition" if at least three unduplicated broadcast television stations are available throughout the entire cable community.

The FCC has observed that in the years following deregulation, the typical basic service tier came to include not only local broadcast signals, but also satellite cable networks, superstations, and locally-originated cable programming. Because of this expansion of basic service, the FCC now concludes that the three signal standard is no longer appropriate. The *Further Notice of Proposed Rulemaking* (*"Further NPRM"*) contains several proposals to revise the definition of "effective competition."

Under the proposed standards, effective competition would be said to exist if any one of the following conditions is satisfied: (1) six over-the-air broadcast television stations are available in the cable community *and* cable penetration is below 50 percent; (2) an independently-owned, competing multichannel video delivery system is available to 50 percent of the homes passed by the incumbent cable system and is subscribed to by at least 10 percent of the homes passed; or (3) the cable system offers a basic tier of service at a rate, and perhaps in a quantity, comparable to that offered in other communities where effective competition is found to exist or where rates otherwise appear to have been held to a reasonable competitive level, and where the system meets specified customer service standards.

As noted above, the *Further NPRM* attributes market power in the provision of basic cable services to the nonlocal programming that became available on the typical basic service tier in the aftermath of deregulation. While the ability to distribute these nonlocal programming services may provide cable systems with market power, it appears that many cable systems have recently relocated these services to tiers that are not subject to regulation. In these cases, any market power in basic service (as distinct from nonbasic or premium service) now derives from the value of the antenna services provided by the cable system (i.e., the system's ability to provide improved reception of local signals), rather than from program services that have been placed in nonregulated service tiers.

If antenna services become the only possible source of market power in basic cable service, an appropriate effective competition standard should be based upon the presence of alternative means to receive local broadcast signals. This suggests a test based on the quality of over-the-air reception in the cable community, and (when such reception is poor) on the presence or absence of alternative video providers (e.g., a second cable system) that could deliver local

programming. Neither the three signal standard nor the proposed six signal standard provides such a test.

Our analysis also suggests that cable penetration rates may be a poor indicator of market power. Low penetration rates may reflect the exercise of market power, rather than its absence. Creating a regulatory "safe harbor" for systems with low penetration rates may unwittingly reward those systems that have served consumers poorly, as well as provide other systems with a future incentive to raise prices and reduce quality.

Last, we recommend that the FCC not adopt its proposed "competitive behavior" standard. The proposal would shield systems from regulation when their price and quality appear similar to those of systems serving markets satisfying the structural effective competition standards. As explained above, however, these structural standards may be flawed. They may impose regulation of basic service when none is warranted, fail to identify market power when it is present, and induce, rather than deter, anticompetitive behavior. It would be undesirable to adopt a "competitive behavior" standard that brings about these potentially harmful outcomes in other markets.

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Comment of the Staff of
the Bureau of Economics and
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of the Federal Trade Commission[1]

April 19, 1991

I. Introduction

The staff of the Federal Trade Commission appreciates this opportunity to submit a comment in response to the Federal Communication Commission's *Further Notice of Proposed Rulemaking*[2] ("*Further NPRM*") concerning the "effective competition" standards for the regulation of cable television basic service rates.[3]

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[1] This comment represents the views of the staff of the Bureau of Economics and the San Francisco Regional Office of the Federal Trade Commission. They are not necessarily the views of the Commission or those of any individual Commissioner. Inquiries regarding this comment should be directed to Michael Vita (202-326-3493) of the FTC's Bureau of Economics or John Wiegand (415-744-7920) of the FTC's San Francisco Regional Office.

[2] *See Further Notice of Proposed Rulemaking* In the Matter of the Effective Competition Standard for the Regulation of Cable Television Basic Service Rates, MM Docket No. 90-4, December 31, 1990.

[3] This comment addresses issues relating to economic efficiency, competition, and the enforcement of the antitrust laws. It does not discuss other policy considerations that may be of relevance to the FCC.

Our comment begins with a discussion of general features of cable regulation that will help in assessing the proposed standards for defining "effective competition" contained in the *Further NPRM*. The discussion then directly addresses the proposed standards. Several conclusions follow that staff believes are particularly relevant to the FCC's inquiry: (1) the ability of cable systems to "retier" their program offerings will likely defeat efforts to regulate the price of nonlocal programming, regardless of the standard chosen; (2) certain proposals may provide cable systems with an incentive to raise price or reduce quality in order to reduce penetration rates and avoid regulation; and (3) signal quality of local broadcast stations may be an important determinant of market power in cable's antenna service. This latter conclusion suggests that the effective competition standard should employ an index of over-the-air reception quality, and some measure of the availability of alternative video providers capable of delivering local programming.

Adoption of the proposed standards would likely subject a much greater number of systems to local regulation.[4] The potential gains from the regulation of firms possessing market power are straightforward -- lower prices to consumers and higher levels of output. The costs are not always as apparent, but can be just as real. Although we have not conducted a detailed study of the costs of reregulating basic cable service, existing research on the effects of price regulation has shown that it may have undesirable consequences for prices, production costs, and service quality.[5] Recent research specifically

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[4] Under a six-signal standard (with no reliance on penetration rates), the *Further NPRM* (*see* para. 12) estimates that about 55 percent of all systems would become subject to basic rate regulation.

[5] Under rate-of-return regulation, the regulator requires an enormous amount of information to carry out its task, and generally must rely upon the regulated firm to supply a substantial portion of it. This regulatory process is administratively costly and may be subject to manipulation by the regulated entity. Second, regulatory errors in setting the allowed rate-of-return can lead to systematic biases in capital investment by the regulated firm. Third, rate-
(continued...)

addressed to the impact of cable rate regulation is mixed, with one study indicating that rate regulation held down the price of basic service, and another indicating that it did not.[6] As our discussion will show, because the proposed standards are not designed to identify market power in the provision of antenna service, there is a risk that their adoption would impose regulatory costs on firms lacking market power in these services, yet fail to regulate systems where the possible existence of market power might justify regulation. Hence, it is not clear that the benefits, if any, from adopting the proposed standards would outweigh the attendant regulatory costs.

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[5](...continued)
of-return regulation provides the firm with little incentive to reduce cost, as all cost reductions are fully rebated to consumers, thus leaving the firm no better off than if it had continued to operate at higher cost. Fourth, if the regulated entity also sells in unregulated markets, the opportunity for profitable, yet socially inefficient, cross-subsidization may be created. Cross-subsidization occurs if the firm attempts to build the costs associated with the unregulated product into the rate base for its regulated product (*see* Brennan, "Cross-Subsidization and Cost Misallocation by Regulated Monopolists," *Journal of Regulatory Economics* 2 (1990), 37-52). For a general survey of the empirical literature on rate-of-return regulation, *see* Joskow and Rose, "The Effects of Economic Regulation," in Schmalensee and Willig, eds., *The Handbook of Industrial Organization*, v. II, 1989. We also note that cable systems would have to make certain investments in new equipment to facilitate retiering. Use of this equipment often would render valueless consumers' investments in cable-ready televisions, VCRs, and the corresponding remote control units.

[6] Zupan (1989) found that the 1984 per-channel price of basic service was $0.22 higher in systems that did not regulate basic service. This price difference was statistically significant at the 99 percent level. *See* Zupan, "Cable Franchise Renewals: Do Incumbent Firms Behave Opportunistically?," *RAND Journal of Economics* 20 (1989), 473-482. By contrast, Prager (1990) reports that the presence of rate regulation appeared to reduce significantly both service quality and cable systems' responsiveness to the demands of the franchising authority, and to increase the perceived frequency and magnitude of price increases. She concludes (p. 223) that "there is no evidence to support the view that regulation reduces the frequency or magnitudes of rate increases," and that "there is no evidence to indicate that regulation at the state or local level effectively constrains the rates charged for basic cable television service." *See* Prager, "Firm Behavior in Franchise Monopoly Markets," *RAND Journal of Economics* 21 (1990), 211-25.

II. Expertise of the Staff of the Federal Trade Commission

The FTC is an independent regulatory agency responsible for maintaining competition and safeguarding the interests of consumers.[7] In response to requests by federal, state, and local government bodies, the staff of the FTC often analyzes regulatory or legislative proposals that may affect competition or the efficiency of the economy. In the course of this work, as well as in antitrust and consumer protection research, nonpublic investigations, and litigation, the staff applies established principles and recent developments in economic theory to competition and consumer protection issues. The FTC staff previously has commented on various issues before the FCC on matters relating to cable television.[8]

III. Background on the Cable Television Rate Regulation and the "Effective Competition" Standard

Regulation of cable service prices has always been limited. Before the passage of the 1984 Cable Act, the FCC had jurisdiction to regulate cable TV to the extent that such regulation was "reasonably ancillary to the . . . regulation of television broadcasting."[9] Under this authority, the FCC promulgated regulations that permitted all franchising authorities to regulate the price of

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[7] 15 U.S.C. §§ 41 - 59.

[8] *See Comment of the Staff of the Bureau of Economics and the San Francisco Regional Office* In the Matter of Competition, Rate Deregulation, and the Commission's Policies Relating to the Provision of Cable Television Service, MM Docket No. 89-600, April 20, 1990 ("*FTC Staff Cable Comment*"); *Reply Comments of the Bureaus of Competition, Economics, and Consumer Protection* in the Matter of Part 76 of the Commission's Rules Concerning the Carriage of Television Broadcast Signals by Cable Television Systems, MM Docket No. 85-349, February 25, 1986; *Comments of the Bureaus of Competition, Consumer Protection, and Economics* In the Matter of Amendment Part 76, Subpart J, Section 76.501 of the Commission's Rules and Regulations Relative to Elimination of the Prohibition on Common Ownership of Cable Television Systems and National Television Networks, CT Docket No. 82-434.

[9] *See United States v. Southeastern Cable Co.*, 392 U.S. 157, 178 (1968).

"regular subscriber service," but not specialized programming with "per-program" or "per-channel" charges.[10] Subsequently, the FCC defined "regular subscriber service" to include the carriage of broadcast signals and any local origination or public access channels required under the franchise.[11] Premium channels, such as HBO, were not part of "regular subscriber service" but rather constituted specialized programming with a per-channel charge that could not be subjected to price regulation.[12] Distant broadcast signals, such as WTBS, WGN and WWOR, and advertiser-supported satellite channels, such as CNN, ESPN, USA and MTV, were also determined not to be "regular subscriber service." Accordingly, a service tier consisting solely of such channels was not subject to rate regulation.[13]

The Cable Act added the requirement that only the regular subscriber service (which the Cable Act defined as "basic service") of cable systems without "effective competition" could be regulated.[14] The Cable Act continued to permit franchising authorities to regulate only tiers of service that included "retransmission of local television broadcast signals."[15]

In 1985 the FCC promulgated rules (amended in 1988) stipulating that basic service is subject to "effective competition" if at least three unduplicated

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[10] 47 C.F.R. § 76.31(a)(4) (1974).

[11] *Clarification of Cable Television Rules*, 52 F.C.C. 2d 1, 68 (1975).

[12] *See Brookhaven Cable TV, Inc. v. Kelly*, 573 F.2d 765 (2d Cir. 1978), *cert. denied*, 441 U.S. 904 (1979).

[13] *See In re Community Cable TV, Inc.*, 95 F.C.C. 2d 1204, 1216-17 (1983) (limiting the scope of permissible rate regulation to local broadcast signals as defined by the FCC's "must-carry" rules). However, if these channels were included in a service tier that included local broadcast signals, the price of that tier would have been subject to rate regulation.

[14] 47 U.S.C. § 623(b). For all practical purposes, however, the scope of regulation remained the same. *See ACLU v. FCC*, 823 F.2d 1554, 1558-59 (D.C. Cir. 1987), *cert. denied*, 485 U.S. 959 (1988).

[15] 47 U.S.C. § 522 (2).

broadcast television stations are available throughout the entire cable community.[16] The basis for the three signal standard was an FCC staff study that examined cable viewership in a sample of 42 cable markets where 2, 3, 4, or 5 over-the-air stations were available.[17] The FCC concluded that the "existence of basic cable service appeared to be comparable to adding one more competitor [station] to a three [station] market," and thus that "the existence of three over-the-air broadcast signals in the cable market provided an effective constraint on the market power of a cable system in the provision of basic service."[18]

The adoption of the "three signal" standard resulted in the deregulation of basic service rates in the vast majority of cable communities.[19] Last year, the FCC indicated its dissatisfaction with the standard, issuing a *Notice of Proposed Rulemaking* to evaluate (and, if appropriate) to revise it.[20] This dissatisfaction stemmed in part from a 1988 update of the 1985 study indicating that basic cable viewership in three station markets had increased, "and now accounts for a larger viewing share than does the off-air viewership of the

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[16] 47 CFR § 76.33(a)(2). Whether a broadcast signal is "available" is determined by its "predicted Grade B contour," or by its status as a "significantly viewed" station. Within a Grade B contour, "the quality of picture [is] expected to be satisfactory to the median observer at least 90 percent of the time for at least 50 percent of the receiving locations within the contour, in the absence of interfering co-channel and adjacent channel signals." *Television and Cable Factbook; Stations Volume No. 58, 1990 ed.*, p. A-13.

[17] *See Alternative Criteria for Defining Effective Competition: A Statistical Analysis of Small Cable Markets*, and the 1988 update, both of which are included in MM Docket No. 90-4.

[18] *Notice of Proposed Rulemaking* In the Matter of the Effective Competition Standard for the Regulation of Cable Television Basic Service Rates (*"Effective Competition NPRM"*), Docket No. 90-4, January 22, 1990, para. 19.

[19] About 4 percent of all cable systems are now subject to local rate regulation.

[20] *See Effective Competition NPRM, supra* note 18.

typical local signal."[21] This finding, along with the general observation that "the basic service tier . . . now includes a full range of programming services, including distant broadcast signals, cable networks, superstations, and locally originated programming,"[22] led the FCC to conclude[23] that "it is clear that the three signal standard no longer reflects effective competition to the *full range* of cable television service" [emphasis added]. The *Effective Competition NPRM* solicited recommendations on how the standard might be revised to better reflect perceived changes in cable television markets.

To replace the three signal standard, the *Further NPRM* proposes three standards to identify effective competition. Under these standards, effective competition for basic cable service would exist if any one of the following conditions is satisfied: (1) there are six over-the-air broadcast television stations available in the cable community *and* cable penetration is below 50 percent;[24] (2) an independently-owned, competing multichannel video delivery system is available to 50 percent, and is subscribed to by at least 10 percent, of the homes passed by the incumbent cable system; or (3) the cable system offers a basic tier of service at a rate, and perhaps in a quantity, comparable to that offered in other communities where effective competition is found to exist, or at a rate that otherwise appears to have been held to a reasonable, competitive level, and in either case the system also meets specified customer service standards.[25]

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[21] *Id.*

[22] *See Further NPRM*, para. 5.

[23] *See Further NPRM*, para. 11.

[24] A system's "penetration rate" is its ratio of subscribers to "homes passed."

[25] These standards refer to the system's performance in the following areas: (1) office and telephone availability; (2) installations, outages, and service calls; and (3) provision of information on matters such as bills and refunds.

IV. Economic Analysis of the Current Proposals

A. The Effect of Rate Regulation on the Content of Basic Service

Whatever standard is adopted for identifying "effective competition," franchise authorities may regulate only the rates for service tiers that include retransmission of local television broadcast signals. As we and others have noted,[26] the content of basic cable service is not fixed; cable systems have considerable discretion in choosing which channels to include in the basic service tier, and which to incorporate into other, nonregulated, tiers.[27] Before enactment of the Cable Act, many cable systems created basic service tiers containing limited offerings in order to reduce the number of channels subject to regulation.[28] After passage of the Act, operators added channels to basic tiers, raising basic prices, and reduced the number of channels (and the prices)

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[26] *See FTC Staff Cable Comment*, *supra* note 8, pp. 23-24, and *Reply Comments of the United States Department of Justice* In the Matter of the Effective Competition Standard for Regulation of Cable Television Basic Service Rates, MM Docket No. 90-4, May 7, 1990.

[27] The FCC has explicitly noted this in its *Effective Competition NPRM*, para. 44, and in its *Further NPRM*, para. 45. Paragraph 45 of the *Further NPRM* states that "we believe that the Cable Act permits cable operators to move a service from one tier to another if: (1) the service is not required by the franchise agreement; or (2) even if the service is required by the franchise agreement, the tiers involved are not subject to rate regulation."

Section 635 (d) of the Cable Act, 47 U.S.C. § 545 (d), authorizes cable operators to rearrange services from one tier to another, but only as long as the tiers involved are unregulated at the time the rearrangement is made. Therefore, if a cable system is not subject to regulation under the existing effective competition standard, the operator can freely create and reconfigure service tiers. If such an operator creates a basic service tier consisting solely of local broadcast stations, then even if a new effective competition standard subjects that operator to regulation, only the stations in that broadcast tier could be regulated; the system would enjoy continued freedom to shift all other stations among the other tiers. However, a cable system that has not segregated satellite stations from local broadcast stations at the time new effective competition standards are adopted will be prevented from doing so by § 545(d) if the system is found not to be subject to effective competition. Consequently, for these systems, satellite stations, as well as local broadcast stations, would be subject to regulation.

[28] *See Effective Competition NPRM* (para. 16).

on nonbasic tiers.[29] Lately, in apparent anticipation of a more stringent effective competition standard and a resulting increase in the likelihood of regulation, many multisystem operators have again created service tiers that consist principally, if not exclusively, of retransmitted local stations.[30] If a more stringent standard is adopted, therefore, these operators will be able to avoid regulation for all but a skeletal tier of channels.

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[29] *See, e.g.*, "Basic Nets Aren't Cheering as Operators Gear Up for Tiering," *Multichannel News* (May 20, 1990).

[30] During 1990, for example, Tele-Communications, Inc. (TCI), American Television and Communications (ATC), Viacom, Warner Cable, Continental Cablevision, Jones Intercable, Newhouse Broadcasting, Cablevision Industries, Paragon, Century Communications, Adelphia, United Artists Entertainment, Falcon, Times Mirror, Cablevision Systems, and Telecable, all initiated (or expanded the use of) broadcast-based tiers in large numbers of their systems. *See* "Cable MSO's: Back to the Future With Tiering," *Broadcasting*, May 21, 1990; "ATC Systems Join Tiering Movement," *Broadcasting*, April 30, 1990; "Viacom the Latest to Tier," *Broadcasting*, July 2, 1990. Some cable operators appear to be placing a small number of other types of programming with over-the-air broadcast channels on the lowest basic tier. First, some programmers (e.g., home shopping and religious programming) have been known to pay cable systems for carriage on the basic service tier. Second, the system of royalty payments established by the Copyright Royalty Tribunal may create incentives for cable systems to place distant broadcast stations on basic service. However, the highest-valued nonlocal channels (e.g., ESPN, TNT, CNN, MTV, and USA) are apparently being placed on unregulated tiers. Third, the franchising authority may be able to require a system to place locally-programmed public access, educational and governmental channels on the lowest tier. *See* 47 U.S.C. § 531 (a).

Many cable program suppliers have tended to oppose tiering. As we explained in last year's comment (*see FTC Staff Cable Comment*, pp. 48-51), programmers have an incentive to constrain the market power of cable systems. When a cable system raises its rates, thus reducing subscribership, programmers' profits are reduced because they receive (1) fewer direct per-subscriber payments from the cable system, and (2) less advertising revenue. Accordingly, programmers would be expected to attempt to enter into contracts with systems that constrain this ability to exercise market power. Such contracts could specify maximum cable service prices or minimum output quotas (*See* Blair and Kaserman, *Law and Economics of Vertical Integration and Control*, 1983, pp. 35-36). They might seek the achievement of some minimum penetration rate for the service tier on which a program service is offered, with financial penalties incurred if the minimum is not satisfied. It now appears that many of the major programmers are entering into such contracts (*See* "Tiering Talk Fuels Contract Changes," *Broadcasting*, August 27, 1990). To the extent that programming suppliers are able to constrain cable system market power through such contracts, the need for government regulation of nonlocal programming is diminished.

B. Reception Quality and Market Power in Antenna Service

The only source of market power in basic service that does not derive from the presence of channels that are transferrable to nonregulated tiers is a system's ability to provide improved reception of local broadcast signals. The *Further NPRM* refers to this as "antenna service."[31] If the threat of reregulation has induced cable systems to alter basic service so that it consists mainly of retransmitted local signals, then the market constraint on the pricing of this service is its closest substitute, which usually will be local broadcast stations. In some cable markets, physical obstructions (e.g., hills and tall buildings) may prevent many residents from receiving some or all of the local stations over-the-air, notwithstanding their location within the stations' predicted reception area.[32] This, as we discuss in greater detail in § IV.C, below, suggests that an appropriate effective competition standard might be based upon some index of local station reception quality, rather than on the presence of some minimum number of broadcast stations.

C. The "Six Signal - 50 Percent Penetration" Standard

The first of the three proposed effective competition standards (the "6/50" standard) would deem that a cable system is subject to effective competition in the provision of basic service if there are at least six over-the-air signals available in the cable community *and* the system's penetration rate is *less* than 50 percent. This standard reflects two assumptions about competition in the provision of video signals: first, that increasing the number of local broadcast signals reduces a cable system's market power; and second, that a cable system's penetration rate is a good proxy for its market power.

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[31] *See Further NPRM*, para. 11.

[32] This is measured as the station's "predicted Grade B contour." *See* note 16, *supra.*

Whether the "6/50" standard would accurately identify market power in the provision of basic cable service depends upon what is meant by market power. It is conventional to define a firm's market power in terms of its unilateral ability profitably to raise price above marginal cost. The ability to impose such a price increase is not determined by the firm's market share (although market share plays a role), but rather by the elasticity of the residual demand facing the firm.[33] The firm's residual demand elasticity incorporates both the demand-side responses of consumers, as well as the supply-side responses of other producers, to a price increase by the firm. A firm facing a highly elastic residual demand curve at the competitive price has little

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[33] *See* Landes and Posner, "Market Power in Antitrust Cases," *Harvard Law Review* 94 (1981), 937-83, esp. pp. 944-50. A firm's residual demand elasticity is determined by (1) the elasticity of the market demand curve, (2) the supply elasticity of fringe producers of the product, and (3) the firm's market share.

Some have proposed other measures of market power, such as "Tobin's 'q'." (*See* Lindenberg and Ross, "Tobin's q ratio and Industrial Organization," *Journal of Business* 54 (1981), 1-32). Tobin's "q" is the ratio of the market value of a firm to the replacement cost of its assets. A firm cannot have a high "q" ratio from the exercise of unilateral market power unless that firm faces an inelastic residual demand curve. If a firm faces an inelastic residual demand curve, and can raise prices above marginal (and, more importantly, average) cost, it will earn economic profits. The discounted present value of these profits will be reflected in the value of the firm's equity, which is part of the numerator of the "q" ratio. Hence, the exercise of market power will increase the value of "q" (relative to a situation where the firm earns zero economic profits).

A high value of "q" can be caused by factors other than the exercise of market power. For example, if a firm has intangible assets (e.g., goodwill), the returns to this asset will appear in the numerator of "q;" however, the value of these assets are typically omitted from the denominator because researchers generally lack data on intangible assets. This will inflate "q." Similarly, if the firm is earning scarcity rents on specialized assets whose value is not fully reflected in the firm's accounts, a high value of "q" again will result for reasons unrelated to market power.

Estimating "q" can present formidable measurement problems. As Lindenberg and Ross (p. 12) note, computing replacement costs even for tangible assets can be a difficult undertaking, as it requires adjustments for "varying levels of technological advance across plant categories and product types, and for varying rates of 'real' (versus book) depreciation."

Several parties have submitted studies to the FCC suggesting that cable systems have high "q" ratios (*See Further NPRM*, para. 9). To the extent that these "q" ratios measure market power, and are not an artifact of measurement errors, they represent market power for the entire range of services produced by the cable system. These studies do not address whether cable systems' have market power in the provision of antenna service.

exploitable market power, even if its market share is high, as a small unilateral price increase would cause such large sales reductions that the price increase would be unprofitable, and therefore not attempted or quickly rescinded.

This definition implies that the existence of market power in the provision of antenna service does not depend on the number of over-the-air stations available. As our previous discussion of service tier reconfiguration suggests, the threat of rate regulation could induce cable systems to reconfigure their basic service packages such that they consist mainly of local broadcast stations.[34] This means that in areas where there are only four over-the-air stations, basic service on the local cable system would now consist chiefly of these four stations. If so, whether this cable system has market power in the pricing of this tier would depend primarily upon consumers' ability to receive these signals from over-the-air broadcasters. If over-the-air reception quality is similar to that obtainable through cable antenna service, then the cable system will probably have no market power in this service, as many consumers would switch to over-the-air reception if the system attempted to raise its price.[35] By contrast, if local conditions cause signal quality to be poor for a large number of consumers in the cable community, market power in antenna service could exist even if there are six (or more) over-the-air stations. In these latter instances, price regulation of basic service might enhance consumer welfare.[36] The critical factor in assessing market power in antenna service, however, is the degree of similarity between cable and over-the-air reception quality, not the absolute number of over-the-air signals.

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[34] Some additional, lower-value stations might also be included in basic service. *See* note 30, *supra.*

[35] This of course does not rule out the possibility that the cable system could have market power in nonbasic service.

[36] Even in these cases, of course, regulation may be inefficient. *See supra* notes 5 and 6, and accompanying text.

Our analysis suggests that the FCC should attempt to develop an effective competition standard based on the value of the antenna service supplied by the cable system. The value of a cable system's antenna service is likely to be related to the number of households in the community that suffer from poor over-the-air reception. This suggests the creation of an index of actual (rather than predicted) reception of the local signals carried on the system. Alternatively, the standard for reception could be based on a prediction of signal quality if the method of prediction produced a closer proxy for actual reception than the predicted Grade B contour.[37] Where reception quality is poor, and where there is no alternative multichannel distributor capable of delivering these signals to a substantial portion of the community (*see* the discussion in § IV.D, below), then a basis for basic service regulation might exist.

Under our proposal, the franchising authority would be permitted to regulate basic rates when it could demonstrate that some specified percentage of the cable community (e.g., 20 percent or more) could not receive this complement of signals at a Grade B contour (or better) level of quality.[38]

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[37] The predicted Grade A Contour (*see* 47 CFR § 73.684), or an even more demanding, but similarly defined, test might be appropriate.

[38] It is unnecessary to require that 100 percent of the community receive high quality reception, provided that the cable system cannot price discriminate (i.e., charge a monopoly price to those for whom reception quality is poor, and a lower (possibly competitive) price to all others). If price discrimination is not possible, the cable system could exercise market power against those with poor reception only by raising prices to all subscribers (i.e., including those with good reception). This would entail raising price above the profit-maximizing level to the latter. If there are many subscribers who benefit from good over-the-air reception, the profit sacrifice from charging these customers too high a price could more than offset the profit increase from charging a monopoly price to customers with poor reception. In such cases, the system's profit-maximizing strategy would be to charge all customers a price at or below the reservation price of those with good reception. Franchising authorities are authorized to prevent cable systems from charging different prices to different groups of subscribers. 47 U.S.C. § 543 (f) (1). However, enforcement of this authority may sometimes prove difficult, in which case the ability to price discriminate may exist.

Though this proposal could distort somewhat a system's choice of which local stations to carry -- systems would have some incentive to avoid carriage of stations with poor over-the-air reception -- we conjecture that consumer demand[39] for the provision of certain local signals (such as those of network affiliates) would induce the system to offer the highly-valued channels.

A standard based on the presence of some specific number of broadcast signals would be more reasonable if the FCC's mandate were to regulate *all* of the services cable systems provide, not just basic service. In either case, the three empirical studies submitted to the FCC in this docket would merit closer scrutiny,[40] as all found some indication of a relationship between the number of over-the-air signals and basic service prices. After reviewing these studies in detail, however, we are unpersuaded that they alone adequately justify adoption of a six signal standard, given existing regulatory authority.[41]

Our analysis above suggests that the adoption of a six signal standard in the presence of irreversible tier reconfiguration may not be effective in

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[39] The *Further NPRM* notes (para. 8) that in cable homes the highest proportion of viewing is of local television stations.

[40] These are: Bykowsky and Sloan, "Competitive Effects of Broadcast Signals on the Price of Basic Service," Office of Policy Analysis and Development, National Telecommunications and Information Administration, April 1990 ("NTIA study"); Dertouzos and Wildman, "The Competitive Effects of Broadcast Signals on Cable," prepared for the National Cable Television Association, February 22, 1990, and submitted in response to the *Effective Competition NPRM* ("NCTA study"); and Crandall, "Regulation, Competition, and Cable Performance," a paper commissioned by TCI, Inc., 1990 ("TCI study"). The value of these studies is limited if reconfiguration cannot be constrained. This is because they examine the relationship between the number of over-the-air signals and the price of basic service as basic service is configured in the current regulatory environment (i.e., inclusive of nonlocal programming). Thus, it seems likely that the estimated relationship reflects the constraint imposed by local signals on the pricing of services that would be removed from basic service in the event of reregulation. Accordingly, these studies could provide information on the extent of competition between over-the-air signals and a broad range of cable services. With reconfiguration possible, however, the relevant issue is the degree to which over-the-air signals would constrain *basic* service prices after service tier reconfiguration occurs.

[41] A more detailed analysis of these studies is provided in the Appendix to this comment.

constraining market power in the distribution of nonlocal programming. Adding a penetration rate condition to this test would create additional regulatory problems. The *Further NPRM* (para. 5) observes that after deregulation, basic cable rates increased at the same time that cable penetration rose, and infers that this "might suggest that competitive alternatives to basic service are limited." As we noted, however, the penetration rate may be a highly imperfect measure of market power because it often will not provide a good proxy for a firm's residual demand elasticity. Inferring the presence of market power from information on penetration rates alone, or from correlations between penetration rates and prices, is hazardous because the direction of causation is difficult to infer. Prices may be high when a cable system has a high penetration rate because the system is exercising market power. Conversely, if consumers prefer a high quality system (e.g., a system with a large number of channels), prices and penetration rates may be highly and positively correlated because competitive forces have induced the cable system to produce a high quality, high price system. Absent an analysis that accounts for the simultaneous nature of a cable system's price, channel capacity, channel offerings, and costs, it is difficult (and in many cases, wrong) to infer that a penetration rate over 50 percent reflects market power. Likewise, many criticisms of cable system performance filed in response to the *Effective Competition NPRM*[42] have mistakenly attributed market power to cable systems because penetration rates rose with basic service prices in the aftermath of cable deregulation. In our view, these criticisms generally fail to account for the fact that cable demand and basic service quality also rose during this period.[43]

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[42] *See, e.g.*, the comments submitted by NAB and INTV.

[43] For example, the average number of stations on the most popular service tier rose from about 23 in 1984 to almost 34 in 1989. *See* U.S. General (continued...)

As the FCC observed in the 1990 *Effective Competition NPRM*, as well as in its 1985 rulemaking,[44] the use of a "penetration standard could create a disincentive for cable operators to upgrade the quality and level of services they now provide." It was for this reason that the FCC concluded in 1985 "that adoption of a cable penetration criterion as part of the effective competition standard would not be in the public interest." We agree with this position. Systems that charge supracompetitive prices, offer a small number (or poor quality) of channel selections, or poor overall service, could escape regulation if this performance resulted in a penetration rate below 50 percent. Incentives to lower rates for both basic and nonbasic service would be lessened, if the increase in subscribership would push the system over the 50 percent penetration threshold; indeed, systems whose current penetration rate is slightly more than 50 percent would have an incentive to *raise* rates, if by so doing they could reduce their penetration rate to below 50 percent and avoid the burden of rate regulation.[45] Similarly, a penetration rate standard would discourage systems from offering improved quality to cable subscribers. Improved program offerings, investments in upgraded channel capacity, and other quality-related aspects of cable service would be deterred to the extent that the attendant increase in subscribership would trigger rate regulation.

In the *Further NPRM* the FCC continues to recognize the possible incentives for inefficient behavior embodied in the "6/50" standard, but argues

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[43](...continued)
Accounting Office, *Report to the Chairman, Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce, House of Representatives: Follow-Up National Survey of Cable Television Rates and Services*, June 1990, table I.2.

[44] *See NPRM*, *supra* note 18, para. 29, and *Final Rule*, Implementation of the Provisions of the Cable Communications Policy Act of 1984, 50 *Federal Register* 18651 (May 2, 1985).

[45] This possibility was noted in the *Effective Competition NPRM* (*see* para. 29).

that such behavior is unlikely to occur. Paragraph 24 of the *Further NPRM* states that "by using a penetration test of below a low benchmark as opposed to above a high benchmark, it is unlikely that perverse incentives will cause cable systems to hold penetration down just to escape regulation, given the economic advantages to the cable system of increasing penetration." Put differently, the conclusion is that the marginal profitability of increasing subscribership is positive, even when such an increase activates rate-of-return regulation where none previously existed.[46] In our view, the empirical record established by responses to the *Effective Competition NPRM* does not clearly support this presumption. Given that rate-of-return regulation is costly to firms,[47] an equally plausible presumption is that firms will avoid increasing their subscribership when the increase would trigger costly regulation.

D. The "Alternative Multichannel Video Delivery System" Standard

The second standard under which effective competition would be deemed to exist is based on the presence of an independently-owned multichannel video delivery service in the cable community. Effective competition would be said to exist if at least 50 percent of the homes passed by the incumbent cable system are capable of receiving the alternative service, and 10 percent of these homes subscribe to the alternative.

For practical purposes, three alternative video providers are of interest: other cable systems ("overbuilders"); satellite master antenna television

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[46] According to the General Accounting Office, the average penetration rate in December 1989 was 58 percent. The GAO Report does not provide information on the distribution of penetration rates (although such information apparently could be easily derived from the responses to the *Follow-Up Survey*), so it is not known how many systems are at or near the 50 percent threshold.

[47] *See, e.g.*, Joskow and Rose, *supra* note 5.

("SMATV") systems, which are private cable systems;[48] and multipoint, multichannel distribution systems ("MMDS").[49] Both overbuilding and head-to-head competition between MMDS's and cable systems are relatively rare (although the frequency of both appears to be increasing), so currently this standard would apply in few instances. Future circumstances, of course, could be quite different.

Assessing effective competition based on the presence of a close substitute for cable services has considerable appeal. The closest substitute for the incumbent cable system is another cable system, and basing an effective competition standard on the presence of a second system that has "overbuilt" a substantial portion of the incumbent's franchise area is intuitively sensible. We believe that this conclusion holds even if the two systems differ in channel capacity, since, as we have frequently stressed, the relevant comparison is not between the basic service tiers as currently configured, but as they would come to appear if the threat of rate regulation induced retiering. Absent the threat of regulation, the larger of two systems might offer a more comprehensive basic package than the smaller system; however, if this (pre-regulation) difference in the composition of basic service were to trigger basic service regulation, both systems would likely reconfigure their service tiers, so that basic service on each would come to consist mainly of over-the-air signals.[50] This would create

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[48] That is, they do not cross public rights-of-way. In many jurisdictions, the local cable system is statutorily entitled to a "right of access" to buildings served by a SMATV system, so there is a possibility of "overbuild" competition between the two.

[49] The other potential video distributor is direct broadcast service ("DBS"). DBS is not yet commercially available, although it is now being test marketed in a number of cities.

[50] The larger of the two systems would obviously be able to offer a more expansive array of expanded service tiers than the smaller system, and this might mean that the latter could not effectively constrain the pricing of these nonbasic services. The issue of market power in nonbasic services is beyond the scope of this rulemaking.

an odd (and likely unintended) situation: the franchising authority would regulate the price of basic service, despite the fact that households in the cable community (unlike households in the majority of cable communities) could choose from two similar, independently-provided basic service packages.

MMDS differ from cable systems in some important respects. They typically offer smaller channel capacities (usually fewer than 30 channels), and can suffer from reception problems when hilly terrains or tall buildings obstruct their line-of-sight transmissions. Nonetheless, many MMDS would be capable of providing retransmitted local signals, should it become profitable to do so.

We note that in most of the instances of direct competition between cable systems and MMDS of which we are aware (New York City, Detroit, Cleveland, Albany, and Sacramento), the MMDS generally does not retransmit local broadcast signals, but instead installs an antenna concurrently with the MMDS reception equipment. This allows a customer to receive local stations directly over-the-air, conserving the MMDS channel capacity for nonlocal programming services. That MMDS subscribers in these particular markets apparently can receive broadcast signals with rooftop antennas indicates that over-the-air reception is probably a good substitute for cable antenna service. Hence, if the FCC were to adopt an effective competition standard based on over-the-air reception quality, such a standard would likely be satisfied in these particular markets. The "alternative distributor" standard would thus be moot.

As in the case of the "6/50" standard, we recommend that the FCC eschew the use of a penetration rate in the creation of this standard. A low penetration rate for the entrant may only mean that the incumbent cable system responded to entry by offering consumers a preferred mixture of price and quality, thus impeding the expansion of the entrant; a high penetration rate may signify the incumbent maintained its high prices (or low quality) in the

face of entry, thus permitting the entrant to gain a larger market share than would otherwise have been possible. Basing the "alternative distributor" test on its penetration rate could result in the imposition of regulation in the first instance, but not the second. Moreover, as we discussed in the case of the "6/50" standard, use of the penetration rate could, under some circumstances, create incentives for the incumbent cable system to raise price or reduce quality. This would be the case if raising price or reducing quality would permit the alternative video distributor to increase its market share to the point where the "safe harbor" conditions are satisfied.

E. The "Competitive Behavior" Test

The FCC also proposes a third effective competition standard, which would shield from regulation systems that, despite a failure to satisfy either of the other two standards, nonetheless appear to behave "competitively."

This proposed standard has two parts. A cable system would be regarded as subject to effective competition if it "offered a basic tier of service corresponding in rates, and perhaps in quantity, to those in communities where effective competition is readily apparent."[51] The cable system also would have to certify annually that it has complied with specific customer service standards regarding items such as office and telephone availability.

To implement the first part of this standard, the FCC would specify the pricing and complement of signals that make up basic service. The FCC states that the appropriate benchmark would be the basic service tiers offered by communities that satisfy the structural effective competition standards described above. However, because information on these benchmarks will not become available until after the structural standards have been in force for some time, transitional standards are suggested. To satisfy these transitional

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[51] *Further NPRM*, para. 30.

standards, the FCC suggests that the cable systems might have to offer a minimum number of basic channels at some maximum price (e.g., each system would have to offer its pre-deregulation number of basic channels at its inflation-adjusted, pre-deregulation price). Alternatively, the transitional standard could consist of the specification of a maximum per-channel price, without a specification of the number of channels in the service tier.

The principal disadvantage of this proposal is its reliance upon behavior in markets identified as "competitive" under the structural standards as a reference point. As we suggested earlier, the proposed structural standards (especially the "6/50" standard, which is likely to be the operative standard in the majority of markets) may be flawed.

There are also problems with the proposed transitional standards. One of these proposals would classify a system's competitive performance by reference to the price and level of basic service offered by the median survey respondent to the 1990 FCC/GAO *Follow-Up Survey*.[52] For example, the FCC suggests that any system offering basic service consisting of at least 23 channels at or below a price of $16.45[53] (the median as of December 31, 1989) would be considered to be providing competitive service.[54] The assumption implicit in this proposal apparently is that a failure to satisfy this standard reflects the exercise of market power, rather than regional variation in cost or demand factors. In our view, this would be an unwarranted judgment. Many plainly competitive markets, such as residential housing markets, exhibit substantial interregional differences in both price and quality that clearly cannot be attributed to differences in market structure; rather, such variation may result from regional differences in incomes, preferences, input prices, population

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[52] *Supra*, note 43.

[53] This would be adjusted for inflation.

[54] *See Further NPRM*, para. 31.

density, local regulations, and so forth. Variation in these same factors would be expected to induce variations in cable service and prices, whatever the degree of market power possessed by the incumbent cable system.[55]

An alternative transitional standard would specify a maximum per channel price, but not a minimum number of channels, in the basic service tier. As the *Further NPRM* notes, this would provide a degree of flexibility not afforded by the previously-described standard. It could, however, provide cable systems with an incentive to reduce the quality of the basic service tier. Whenever a binding price ceiling is imposed on a good whose quality can be varied by producers, an incentive is created to degrade quality (because lower quality goods are less costly to produce than higher quality goods).[56] Imposing a per-channel maximum price on channels in the basic service tier could result, as suggested in the *Further NPRM*,[57] in an expansion in the size of the basic service tier by incorporating additional low-cost, low-valued channels into the tier. By so doing, the average per-channel price could be reduced to satisfy the price constraint. The effects on consumer welfare of this adjustment cannot be ascertained from purely theoretical analysis; they depend upon the relationship of the regulated price to the competitive price.

Whether this incentive to degrade quality can be effectively mitigated (*see Further NPRM*, para. 35) depends on the ability to regulate both quality and price in a way the serves consumers' interests. This is likely to be difficult. In

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[55] An alternative standard would require the provision of an 18 channel basic service tier, or a basic tier containing 80 percent of the system's channel capacity (whichever is lower), priced at $0.57 per channel per month (adjusted for inflation). These price and service levels characterized the national average for the most popular basic service tier as of November 1986, the month immediately preceding cable deregulation. This also would impose a degree of uniformity across cable systems that may be unwarranted and undesirable given the likely existence of interregional cost and demand differentials.

[56] *See* Leffler, "Ambiguous Changes in Product Quality," *American Economic Review* 72 (1982), 956-67, for an analysis of this issue.

[57] *See Further NPRM*, para. 35.

principle, regulations could be created that mandate the provision of certain specified programming services (e.g., CNN) in the basic tier. However, deciding what nonlocal services must be included in this programming bundle would require arbitrary and subjective regulatory judgments.[58] Moreover, there may be legal impediments to mandating the content of basic cable service.[59]

V. Conclusion

With retiering possible, market power in basic service (as distinct from market power in nonbasic service) would derive from the value of the antenna services provided by the cable system, not from program sources that have been placed in nonregulated service tiers. This suggests that the FCC should consider whether it would be practical to establish an effective competition standard based on the actual reception quality of local over-the-air signals. Such an index might provide a useful proxy for the value of these antenna services. We do not believe that a standard based on the presence of some particular number of over-the-air signals would closely or adequately reflect the presence of market power in cable's antenna service.

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[58] The existence of such regulations could reduce the incentives to create new programming services. If, for example, regulations mandate the provision of certain existing programming services, a cable system would find it costly to attempt to displace one of these services with something new, even if consumers would likely prefer the alternative.

[59] *See Quincy Cable TV, Inc. v. FCC*, 768 F.2d 1434 (D.C. Cir. 1985) (requiring cable operators to carry local broadcast signals is unconstitutional), *cert. denied*, 476 U.S. 1169 (1986). Although the scope of cable's First Amendment protection is not yet fully-defined, it is clear that cable programming decisions have some level of constitutional protection. *See City of Los Angeles v. Preferred Communications, Inc.*, 476 U.S. 488 (1986) (operation of cable systems "plainly implicates First Amendment interests"); *FCC v. Midwest Video Corp.*, 440 U.S. 689, 707 (1979) (cable operators have "a significant amount of editorial discretion"). Consequently, any attempt at regulation that controlled cable operators' programming decisions could be challenged under the First Amendment. *See Boos v. Barry*, 485 U.S. 312 (1988) (restrictions that relate to speech content invalid).

We also believe that penetration rates do not reliably indicate market power and that their use as an effective competition standard could reduce consumer welfare. Low penetration may reflect the exercise of market power, rather than its absence. Creating a regulatory "safe harbor" for systems with low penetration rates may create incentives to raise prices and reduce quality.

Appendix

Three studies were submitted to the FCC that explore the relationship between the number of over-the-air signals in a community and basic cable service rates.[60] How much information do these studies provide on the extent to which over-the-air signals compete with the broad range of cable services? In our 1990 *FTC Staff Cable Comment*, we noted that the most direct measure of a cable system's market power could be gotten from the estimation of its structural residual demand curve.[61] Properly estimated, such an equation would provide direct evidence on the ability of a cable system profitably to raise price. The estimation of such an equation admittedly would be difficult. It would require the availability of cost data that are unique to the provision of cable services (i.e., costs incurred by cable systems, but not by their potential rivals, such as local broadcasters). The estimation of such an equation for a cable system would be further complicated because of the potential for quality variation in cable services. That is, it would be unrealistic to model cable demand as a simple relationship between the number of subscribers and the price of service; one must also take into account factors such as the number of channels and the quality of the programming offered. In principle, however, if one had access to a full range of cost data (e.g., costs of cable equipment, wages of cable system personnel, and programming prices), such structural estimation could be undertaken.

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[60] These are: Bykowsky and Sloan, "Competitive Effects of Broadcast Signals on the Price of Basic Service," Office of Policy Analysis and Development, National Telecommunications and Information Administration, April 1990 ("NTIA study"); Dertouzos and Wildman, "The Competitive Effects of Broadcast Signals on Cable," prepared for the National Cable Television Association, February 22, 1990, and submitted in response to the *Effective Competition NPRM* ("NCTA study"); and Crandall, "Regulation, Competition, and Cable Performance," paper commissioned by TCI, Inc., 1990 ("TCI study").

[61] *See* § IV.C.

Unfortunately, these data are not readily available, which precludes estimation of the "structural" demand curves. Instead, the authors of the studies submitted to the FCC estimated equations that appear to combine elements of "reduced form" estimation with elements of structural estimation. It is difficult to know how to interpret the parameter estimates obtained from such an exercise. In the current context, a reduced form equation for cable prices would relate the price of cable services to variables that are beyond the control of an individual cable system, but which would nonetheless affect either the demand for cable service (e.g., per-capita income) or the cost of cable service (e.g., the cost of coaxial cable and the cost of satellite programming). If one incorporated all (or at least the most important) of these relevant factors into the estimation of the reduced form, one could plausibly interpret the observed relationship between the number of over-the-air signals and the price of cable as some measure of the competitive impact of the former.[62] If, however, important determinants of cable prices are omitted, and if these omitted variables are correlated with those variables that are included in the reduced form equation, it is likely that the relationship between the number of broadcast signals and the price of basic service will be incorrectly measured.[63]

Omission of relevant explanatory variables would appear to present a problem for all three studies. The only cost variable of any sort included in any of the studies is the number of miles of cable for each system. In addition to lacking cost data, the NTIA study also lacks any demand-side variables (e.g., income) that would plausibly affect cable demand (hence prices). Consequently, all three studies may suffer, to varying degrees, from omitted variable bias.

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[62] A reduced form coefficient provides the measure of the net impact of a change in the value of an exogenous variable on the equilibrium value of the endogenous variable. *See* Theil, *Principles of Econometrics*, 1971, p. 465.

[63] *See, e.g.*, Kmenta, *Elements of Econometrics*, 1971, pp. 392-95.

The TCI and NCTA studies include a broader range of demand data than does the NTIA study. However, both suffer from other problems that limit their usefulness. For example, the TCI study includes the number of subscribers as an explanatory variable in the price equation. One would expect the number of subscribers to affect price, but also to be affected by price. In the jargon of econometrics, both are "endogenous" variables.[64] The TCI study therefore does not estimate a true reduced form equation. While the author of this study acknowledges that a potential problem is created by the presence of an endogenous variable on the right-hand-side of the price equation, he does not address this problem with appropriate econometric techniques. One approach would be to drop all endogenous variables from the equation, thereby estimating a true reduced form; another would be to use estimation techniques appropriate for structural estimation.[65] The TCI study does neither. As a result, the study's parameter estimates, including those that measure the impact of broadcast signals on basic service prices, are subject to an unknown degree of "simultaneous equations bias."[66] It is hazardous to use such estimates in the formulation of policy rules, as they may fail to represent the true relationship between the number of signals and cable prices.

The NCTA study estimates two models of basic cable prices. The first is a structural equation, as it includes an endogenous variable (the number of channels offered on basic) as an explanatory variable. It is not, however, a full structural demand equation, as it omits other (endogenous) determinants of cable prices, such as the number of subscribers. Unlike the TCI study, the

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[64] Other endogenous variables, such as the number of basic cable channels, are also included on the right-hand-side of this equation.

[65] The most common approach is to use "instrumental variable" estimation methods, sometimes referred to as "two-stage least squares." *See* Maddala, *Econometrics*, 1977, chapter 11.

[66] *Id.*

NCTA study attempts to use an appropriate statistical technique to avoid "simultaneous equations bias." It does this by using a measure of total system channel capacity to develop an "instrumental variable" for the number of basic channels. The authors include this "instrumental variable" as an explanatory variable in a regression of basic service price on other factors, including the number of over-the-air signals. In this equation, the number of over-the-air broadcasts exercises a negative, but statistically insignificant, impact on the price of basic service.

The authors do obtain a negative and statistically significant relationship between the number of broadcast signals and basic prices in their second equation. However, it is difficult to know how to interpret the parameter estimates in this equation. The dependent variable in this equation is basic price per channel. The right-hand-side of this equation includes all of the explanatory variables contained in the first equation, plus the total system capacity variables. The authors characterize this as a "reduced form" equation for basic service prices. It is not, however, a reduced form equation for price (or at least not the reduced form that corresponds to the structural equation estimated earlier in the study). The correct reduced form equation for price would not include any measure of the number of basic cable channels, but would instead simply regress price on all of the exogenous variables in the system. By defining the dependent variable as price per channel, the authors have (in effect) estimated a structural equation in which the number of channels is included as an explanatory variable, but where the coefficient on this variable is restricted to equal one.[67] A test of this parameter restriction,

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[67] To explain further, this study measures both basic price and the number of channels in terms of their natural logarithms. If one estimates the equation log y = a*log x + b*log z (where y is the price, x is the number of basic channels, z is income, and a and b are parameters to be estimated), and the value of a is restricted to equal one, the equation can be rewritten as log y - log x = b*log z, which in turn reduces to log(y/x) = b*log z. In the current context, imposing (continued...)

conducted using the parameter estimate from the first regression, strongly rejects this restriction.[68] This suggests that the second equation is mis-specified because of an invalid parameter restriction. If so, all of the parameter estimates in this equation would be subject to some degree of estimation bias. Consequently, it is difficult to know how much weight should be accorded to the observed negative relationship between the number of broadcast stations and the per-channel price of basic service.

The studies submitted in this docket represent a useful step towards a better understanding of competition in cable markets. However, without further refinement, they cannot, individually or collectively, provide a basis for crafting an effective competition standard based on the number of broadcast signals.

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[67](...continued)
this restriction is equivalent to asserting that a one percent increase in the number of basic channels always leads to a one percent increase in the price of basic service. This strikes us as an unjustifiably strong assumption.

[68] This t-statistic is constructed (using the numbers from table 7 of the NCTA study) as (.184 - 1)/.059 = -13.83. This leads to a strong rejection of the hypothesis that the coefficient on the number of basic channels equals one.