United States General Accounting Office

GAO

Report to Congressional Requesters

July 2000

# TELECOMMUNICATIONS

# The Effect of Competition From Satellite Providers on Cable Rates

GAO

Accountability * Integrity * Reliability

GAO/RCED-00-164

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**Abbreviations**

| | |
|---|---|
| DBS | direct broadcast satellite |
| FCC | Federal Communications Commission |
| MABLE | Master Area Block Level Equivalency |
| MSO | multiple system operator |
| NCTA | National Cable Television Association |
| SBCA | Satellite Broadcasting and Communications Association |
| SHVA | Satellite Home Viewer Act |
| 3SLS | Three-Stage Least Squares |
| 2SLS | Two-Stage Least Squares |

**United States General Accounting Office**
**Washington, D.C. 20548**

**Resources, Community, and**
**Economic Development Division**

B-284341

July 18, 2000

The Honorable Patrick Leahy
Ranking Minority Member
Committee on the Judiciary
United States Senate

The Honorable Mike DeWine
Chairman
The Honorable Herb Kohl
Ranking Minority Member
Subcommittee on Antitrust, Business Rights,
and Competition
Committee on the Judiciary
United States Senate

The Honorable Russell Feingold
United States Senate

For many years, cable television companies faced little competition in the market for subscription video service. In 1994, however, a new generation of satellite service known as direct broadcast satellite (DBS) was introduced. This service enables subscribers to use small satellite reception dishes to receive television programming. DBS has become the most important competitor to the cable industry, but until recently, DBS firms' ability to compete against cable was limited because they could not generally provide local broadcast networks (such as ABC and NBC) in their programming packages in most areas of the United States. Changes to the relevant law went into effect in late 1999, and DBS operators are now permitted and have begun to offer local broadcast signals in many markets throughout the United States. (App. I provides a brief history of the subscription video market.)

Because of your interest in the degree of competitiveness between cable and DBS providers, you asked us to provide information on (1) the extent to which the level of subscribership (or "penetration") of DBS has influenced cable rates and (2) other key factors that may influence the level of cable rates. To respond to this request, we developed an econometric model that examines whether, in 1998 (the most recent year for which cable rate data from the Federal Communications Commission (FCC) were

available), the penetration of DBS subscribership and a variety of other factors influenced the level of cable rates. This model indicates the influence of each factor on cable rates, holding the effects of each of the other factors constant. We discussed our model development with FCC and two academic experts on telecommunications. A detailed description of the model is provided in appendix II. Some limitations of this model are discussed at the end of this letter and in appendix III.

## Results in Brief

We did not find that in calendar year 1998—a time when DBS firms did not generally transmit local broadcast signals as part of the DBS package—greater DBS penetration was correlated with lower cable rates. In fact, our model results indicate that greater DBS penetration was correlated with somewhat higher cable rates. These results suggest that, even though DBS increased the number of substitutes available in the subscription video market, DBS did not exert significant pricing pressure on cable companies to reduce rates at that time. However, we did find that the penetration of DBS was correlated with nonprice competition—in particular, where DBS penetration was high, cable systems tended to provide more channels to subscribers. The greater number of channels may contribute to the higher prices in these areas. DBS also appears to have been more competitive with cable in nonmetropolitan areas. We found DBS penetration to be much higher—holding other factors constant—in nonmetropolitan locations. Because DBS firms are currently making local broadcast signals available in several cities, it is likely that DBS will become a more important competitor to cable in the coming years.

Our model indicated that several other factors influenced cable rates in 1998. We found—as have FCC and others—that a greater number of channels offered by a cable system led to higher cable rates, suggesting that consumers were willing to pay more for a greater number of channels and that providing additional channels is costly for cable companies. We also found that the presence of a nonsatellite competitor had an important effect on cable rates. In particular, we found, as have other studies, that when a second cable system or other ground-based competitor (such as a “wireless cable” provider) is operating in part or all of a franchise area, cable rates were lower. Finally, we found that when a cable franchise was owned by one of the larger national cable systems, cable rates tended to be slightly higher.

## Background

Cable television is currently the dominant means of television program delivery to U.S. households. According to FCC, as of June 1999, almost 97 percent of television households in the United States had access to a cable television system, and approximately 67 percent of television households subscribed to a cable service. Local cable systems are often owned by large media companies and usually face little or no competition as a local provider of subscription video service.

To date, the most significant competitor to cable is the home satellite industry, particularly DBS, which was first launched in 1994. The monthly subscription charges for DBS are generally comparable with cable, although DBS subscribers typically need to purchase the equipment required to receive the satellite signals. Today there are over 10 million DBS subscribers in the United States, accounting for about 12.5 percent of households subscribing to a video service.

Until recently, there was a significant difference between the programming packages of cable and DBS in terms of local broadcast stations. DBS providers were governed by the 1988 Satellite Home Viewer Act, as amended, which was passed at a time when satellite providers did not possess the technology to transmit local broadcast signals to many markets throughout the country. This act gave DBS providers a copyright license to retransmit broadcast network programming only to certain customers—those who could not adequately receive broadcast signals over the air via traditional rooftop antennas.

During the late 1990s, pressure grew on the Congress to provide DBS firms with a broader license to transmit local broadcast signals. First, advances in technology during the 1990s—for example, the ability of DBS providers to use “spot beam” technology to target the signal from a local broadcast station only to satellite subscribers within that station’s viewing area—provided DBS firms with the ability to include local broadcasts for many markets. Second, there was a growing realization that the legal restrictions on broadcast carriage had become an important disadvantage for satellite companies. For example, according to FCC, consumers have historically reported that their inability to receive local signals from DBS operators may negatively affect their decision on whether to subscribe to DBS. Therefore, in late 1999, to facilitate DBS companies’ provision of local broadcast signals, the Congress enacted the Satellite Home Viewer Improvement Act, which provided a broader copyright license to these carriers to provide broadcast signals. Many Members of Congress noted

that, in doing so, they hoped to make DBS a closer substitute for cable services. As a result of that law, DBS subscribers in more than 20 major cities now can watch their local broadcast stations' programming via satellite.

## No Evidence Was Found That 1998 DBS Subscribership Was Associated With Lower Cable Rates

We did not find that greater DBS penetration was correlated with lower cable rates in 1998. In fact, our model found that greater DBS penetration was statistically associated with somewhat higher cable rates. While this finding may indicate that, in 1998, the penetration of DBS did not exert significant pricing pressure on cable companies, we also found that the presence of DBS was correlated with nonprice competition. In particular, our findings suggest that cable companies responded to DBS entry by increasing the number of channels they provide to consumers. Another possible explanation for the estimated relationship between DBS penetration and cable rates is that it is the level of cable rates that influences DBS penetration. In other words, our results could indicate that in places with higher cable rates, subscribers were more likely to migrate to DBS. In fact, we found some evidence that this could be the case. A further discussion of this issue is contained in appendix II.

Our model results indicate that in cable franchises outside of metropolitan statistical areas, DBS penetration tended to be much higher—holding other factors that affect the penetration of DBS constant. Thus, in 1998, rural subscribers may have viewed DBS as a closer substitute for cable than urban and suburban subscribers did. This could be due to several factors. For example, urban dwellers can have more problems installing a satellite dish that is able to "see" the appropriate satellite because of foliage or tall buildings that block the necessary line of sight between the reception dish and the satellite. Also, it was only in 1996 that FCC imposed rules requiring building owners and homeowners' associations to allow homeowners to install satellite reception dishes and only in 1999 that many of these provisions were effectively extended to renters. It is also possible that, at that time, people in rural areas were more familiar with satellite services than those in urban areas because satellite services had been marketed in rural areas for many years. And finally, the law in 1998 provided DBS companies with a copyright license to provide broadcast signals to households in "unserved" areas but not elsewhere. Thus, it may be that in some rural areas that came under the "unserved" definition, DBS actually operated as a very close substitute for cable because some of these subscribers were already receiving broadcast signals over the DBS system.

Our finding that DBS did not impose significant pricing pressure on cable rates may be short-lived. In 1998, consumers were not very familiar with DBS, and the programming packages the companies offered did not generally include local broadcast signals. Today, on the other hand, the two DBS companies are making local broadcasts available in many cities. Therefore, it seems likely that DBS will become a more important competitor to cable systems in the near future.

## Several Demand, Cost, and Market Structure Factors Were Associated With Cable Rates

We found that several key factors influence the level of cable rates. In particular, our model results indicate that the following factors related to consumer demand for cable, the cost of providing cable service, and the competitiveness of the market were correlated with cable rates:

- The number of channels provided by a cable system had the greatest influence on rates of all the variables included in the model. This finding—that a greater number of channels was correlated with considerably higher cable rates—is likely related to both demand and cost. Consumers are willing to pay more for a higher-quality cable channel lineup, and the cost of providing more channels is higher for cable companies.
- The presence of a nonsatellite competitor—such as another cable company or a wireless cable operator—was associated with lower cable rates. In particular, we found that when such a competitor was operating in part or all of a franchise area, cable rates were, on average, 10 percent lower than in franchise areas with no ground-based competitors.
- Rates were slightly higher in cable franchise areas that had had a cable system in place for a long period of time. This finding has been attributed in other studies to demand for the service growing ever greater as consumers become more aware and knowledgeable of a well-established system.
- Cable rates were slightly higher if the owner of a system in a particular franchise area was one of the larger national cable companies. There has been no consensus on how this result should be interpreted.
- Finally, we did not find average wages in a franchise area to be related to higher cable rates.

With the exception of our findings for the wage factor, these basic model results are generally consistent with the findings of other studies. (See app. II for a full discussion of our results.) The stability of these model results over time may also be affected, however, by changes in the marketplace.

Many of the factors affecting cable rates relate to demand, cost, and market structure characteristics that are likely to be influenced by the dramatically changing market for telecommunications, of which cable is a part. As varied telecommunications companies move to provide several services over a given infrastructure—a phenomenon that has been called "convergence"—the cost of providing each service may come to be influenced by the overall costs of providing the bundle of services. Additionally, demand factors are likely to be influenced by convergence as well since consumers' choices for telecommunications services are increasingly affected by their decisions about the entire bundle of telecommunications services that they purchase. And finally, the convergence of technologies is also influencing the competitive nature of the market as companies that traditionally provided only one service over a given infrastructure enter new markets by providing an array of telecommunications services over that same infrastructure. Therefore, the manner in which cable rates are set is likely to change as the telecommunications marketplace develops.

## Agency Comments

We provided a draft of this report to FCC for review and comment. FCC recommended that we clarify our finding that DBS did not exert significant pressure on cable companies to reduce rates during 1998, suggesting that our results could also be interpreted as showing that when cable rates are high, more consumers switch to DBS. We believe that our report thoroughly discusses the two possible relationships between cable rates and DBS penetration and that the model we developed allows us to appropriately interpret the results as we have. The discussion appears primarily in appendix II. FCC also believed that we should better highlight that DBS providers are an important multichannel alternative to cable. Once again, we believe our report adequately makes this point. FCC's comments and our response are contained in appendix V. In addition to the written comments, FCC staff also provided technical comments and corrections related to our model design and other issues, which we incorporated as appropriate.

In addition, we provided a draft of this report to the National Cable Television Association and the Satellite Broadcasting and Communications Association for comment. Generally, both associations believed that the time period studied was too early to detect the full effect of DBS on cable rates. We agree with this concern, particularly in light of the dramatically changing telecommunications marketplace. We suggest that a full understanding of the response to the entry of DBS into the video market

will require continued analysis in the coming years. Our view is that this study provides a helpful baseline for such further studies. The comments of the National Cable Television Association are presented in appendix VI. The comments of the Satellite Broadcasting and Communications Association are presented in appendix VII.

## Scope and Methodology

To address the objectives of this report, we developed an econometric model to ascertain whether the penetration of DBS and several other factors were associated with the level of cable rates in various franchise areas across the country in 1998. In particular, the model sought to determine whether and how two categories of key factors affected cable rates: (1) factors that relate to subscribers' demand for cable service and cable companies' costs of providing service and (2) factors that relate to the degree of competition in the market. The penetration of DBS is one of the competition variables included in the model. We discussed our model development with FCC and two academic experts on telecommunications.

There are some important limitations to the interpretation of our model results. Generally, econometric models provide measures of statistical correlations between explanatory factors and the factor to be explained and do not imply causation between these factors. Some specific limitations of our model relate to the characteristics of the sample of franchise areas chosen by FCC. In particular, our statistical analysis was performed on a sample of 698 cable franchise areas that were included in a survey conducted by FCC. This survey asked questions about cable services, rates, and system characteristics. The survey included all "competitive"—as defined under statute—franchise areas, while the remaining "noncompetitive" franchises were selected within several size classifications (or "strata"). We found that the average number of subscribers within some strata in our sample is substantially greater than the average number of subscribers among all franchises within those strata. Accordingly, the results of our analysis are most applicable in describing the influences on cable rate-setting in larger franchise areas. At the same time, however, we conducted additional analyses on the available data that suggested that the nonrepresentativeness of FCC's franchise data set did not impose a serious problem for our model estimation and interpretation.

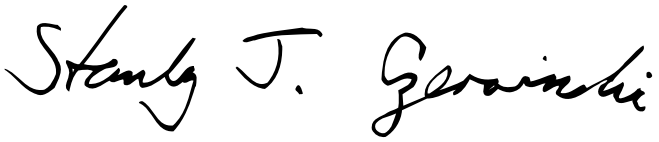
A complete discussion of the model development, data sources, estimation design, model results, and model limitations is contained in appendixes II

and III. A table of descriptive statistics for all variables included in the model appears in appendix IV.

We conducted our review from September 1999 through July 2000 in accordance with generally accepted government auditing standards.

As agreed with your offices, unless you publicly release its contents earlier, we plan no further distribution of this report until 14 days after the date of this letter. At that time, we will provide copies to interested congressional committees; the Honorable William E. Kennard, Chairman, Federal Communications Commission; and other interested parties. We will also make copies available to others upon request.

If you or your staffs have any questions about this report, please contact me at (202) 512-7631. Key contributors to this report are listed in appendix VIII.



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# A Brief History of the Subscription Video Market

Cable television systems were originally deployed in rural or mountainous areas where traditional broadcast television reception was poor. As cable systems expanded their channel offerings, however, the demand for cable services grew, and cable deployment spread throughout the country. Satellite television companies also focused first on serving rural areas, but these services are now marketed to consumers in urban and suburban areas as well, and the acceptance of satellite television services among consumers has enabled these providers to become the cable industry's most viable competitor. While restrictions on satellite firms' carriage of broadcast signals previously limited these firms' competitive viability, the recent passage of a law allowing satellite providers to include broadcast signals as part of their satellite offerings was designed to enhance competition in the video market.

## The Cable Industry Initially Developed to Fill Broadcast Transmission Gaps and Evolved to Be the Dominant Means of Television Delivery

In the early 1950s, the Federal Communications Commission (FCC) helped advance the deployment of broadcast television by devising a system to assign broadcast television channels. The resulting local broadcast system provided licenses for television stations in local areas—rather than in larger regional areas. Because rural areas with few households provided less economic opportunity for a local television station, these areas had fewer stations than did more urbanized areas. As a consequence, households in rural and mountainous areas were often unable to receive broadcasts from local television stations. To fill these gaps in the availability of over-the-air television, cable systems (known at the time as "community antenna TV") began to develop.[1] These systems employed large antennas to capture the broadcast signals of nearby television stations and then retransmitted those signals—for a fee—to homes through coaxial cable wires owned by the cable companies. Most early cable systems focused solely on the retransmission of broadcast networks.

[1]The Congress has divided the authority to regulate cable systems between federal and state authorities. Over the years, FCC has adopted a variety of rules regulating cable, while local communities have explicit power to regulate cable through franchise agreements. These local franchises give cable systems the right to operate in a specified area and to install cables beneath streets or along other public rights-of-way. In some cases, municipalities granted exclusive cable franchises, although the Communications Act now prohibits this.

In the 1970s, cable systems began to expand their programming packages by adding channels that had been developed specifically for distribution on cable systems, such as Home Box Office and Cable News Network.[2] This greater array of channels available on cable systems led to a broadening of demand for cable television, and cable was rapidly deployed throughout urban and suburban areas across the country. According to FCC, as of June 1999, almost 97 percent of television households in the United States have access to a cable system, and approximately 67 percent of television households subscribe to a cable service, making cable the dominant means of television delivery to U.S. households.

As cable system deployment and subscribership grew, the ownership structure of the industry changed. Early on, the cable industry was characterized by privately owned small systems scattered throughout the country. Cable's success in the 1980s, however, attracted the interest of large media companies such as Tele-Communications, Inc.,[3] and Time Warner.[4] These companies, and others, purchased cable systems throughout the country, emerging as large national cable owners known as multiple system operators (MSO). Several of these MSOs also invested in the development of cable programming and thereby established ownership ties between two vertically connected markets: companies producing and supplying cable programming and companies purchasing that programming. This greater concentration of cable properties, combined with ownership ties to cable programming, sparked concerns about the market power of the cable industry and the need for greater competition in the delivery of subscription video services.[5]

[2]By the early 1990s, dozens of such cable programming networks had been developed, many targeting niche audiences.

[3]Tele-Communications, Inc., merged with AT&T in 1999 and is now known as AT&T Cable Services.

[4]American Online (AOL) has proposed purchasing Time Warner in an all-stock transaction valued at $350 billion. The new company would be named AOL Time Warner, Inc.

[5]The Congress responded to these concerns, and to numerous consumer complaints about rising cable rates, by passing the Cable Television Consumer Protection and Competition Act of 1992. Under this act, FCC rolled back and began to regulate cable television rates and prohibited exclusive contracts between cable systems and their affiliated program suppliers. Four years later, the Congress moved toward a more deregulatory approach in the Telecommunications Act of 1996, which sought to open the subscription video market to greater competition and ended most cable rate regulation on Mar. 31, 1999 (although rates for the basic service tier of programming on cable systems, which is not subject to effective competition, remain regulated).

## The Satellite Industry First Focused on Rural Areas but Has Now Become an Important Competitor to Cable

To date, the most significant competitor to cable is the satellite television industry. Satellite subscription service emerged in the early 1980s as an alternative to cable service in rural areas where over-the-air broadcast and cable systems were inaccessible, and it has become popular in many areas in recent years. The most successful of these satellite services has been direct broadcast satellite (DBS). First introduced in 1994, DBS quickly became one of the fastest-growing product lines in the history of consumer electronics. DBS operators have always marketed the technical advantages of DBS' fully digital systems, comparing them to cable's continued reliance on an older technology. Because DBS is fully digital, every video signal can be "compressed" to make more efficient use of satellite capacity and provide hundreds of channels to subscribers. This technical advantage, however, will be short-lived as cable operators move to upgrade their systems to include digital technology.

Monthly service charges for DBS are roughly similar to monthly cable rates, although DBS subscribers may have higher up-front costs because they generally must buy satellite reception equipment.[6] DirecTV and EchoStar, the two providers of DBS in the United States, currently have over 10 million subscribers, accounting for about 12.5 percent of the households subscribing to a multichannel video service.[7] According to FCC, in 1998 almost two out of every three new subscribers to a multichannel video service chose DBS, and from 1998 to 1999, DBS subscribership grew 39 percent. Despite the growing popularity of DBS, FCC reported that 82 percent of all multichannel video service subscribers still receive their video programming from a locally franchised cable operator.

[6]However, prices for DBS equipment have fallen since 1994.

[7]Dominion Video Satellite, Inc., also currently provides DBS service. However, Dominion offers religious-oriented programming on a smaller number of channels than DirecTV or EchoStar. Also, a fourth satellite service, called Primestar, was acquired by DirecTV in May 1999. Primestar was a medium-powered service that required a larger reception dish and had lower channel capacity; its subscribers are being moved to DirecTV's high-powered DBS service.

## The Carriage of Local Broadcast Signals by Cable and by Direct Broadcast Satellite Is Covered Under Different Laws

Until recently, a fundamental difference between the service offerings of DBS companies and those of the cable industry was due to technological and legal limitations on DBS operators' transmission of local broadcast station signals. On the cable side, a 1976 copyright law permits retransmission of local television signals by local cable franchises through permanent copyright licenses. Under this copyright license scheme (17 U.S.C. 111), commonly referred to as a compulsory cable copyright license, copyright owners are required to license their works to cable systems at government-set prices, terms, and conditions. Generally, cable operators pay minimal or no copyright fees to carry local broadcast signals.

A different compulsory copyright license scheme, however, applies to satellite operators. DBS providers were governed by the 1988 Satellite Home Viewer Act, as amended (17 U.S.C. 119), which was originally passed at a time when satellite providers did not possess the technology to transmit local broadcast signals to many markets throughout the country.[8] Until recently, the act granted only a limited exception to the exclusive programming copyrights of television networks and their affiliates. This limited exception gave satellite companies license to deliver broadcast network programming only to those customers living in "unserved households." [9] A household so defined generally would not adequately receive broadcast signals.[10] DBS firms had no license to provide broadcast signals to households in urban or suburban areas that generally could receive adequate over-the-air local broadcast signals.

Recently, the technical ability of DBS operators to provide local broadcast signals improved because of more advanced digital compression technologies as well as "spot beam" technology, which allows DBS to target the signal from a local broadcast station only to the satellite subscribers

[8]Several changes to the 1988 law were included in the 1994 amendments.

[9]The broadcast programming that satellite providers generally offered these subscribers consisted of a package of "distant network signals," or the signals of stations from faraway markets such as Los Angeles or New York.

[10]Specifically, an unserved household was defined in the Satellite Home Viewer Act as one that is not capable of receiving an acceptable over-the-air television signal using a conventional rooftop antenna and that has not received a network signal from the local cable operator within the previous 90 days. An acceptable television signal under the statute is "a signal of Grade B intensity," which is a measure of a signal's strength defined by FCC. The 90-day waiting period before switching from cable to satellite network service was recently deleted by legislation.

within that station's viewing area. Thus, the legal restrictions on broadcast carriage had become an important disadvantage for satellite companies: While cable subscribers were able to receive their local broadcast stations as part of their programming package, most DBS subscribers could not. According to FCC, consumers have historically reported that their inability to receive local broadcast signals from DBS operators made subscribing to DBS less attractive.

In late 1999, the Congress enacted the Satellite Home Viewer Improvement Act (P.L. 106-113) to, among other things, allow DBS companies to provide local broadcast signals. Both EchoStar and DirecTV began rolling out local network television service to more than 20 major cities in November 1999. However, according to the satellite industry, DBS is unlikely to provide local stations to all markets because DBS satellites have limited capacity.[11]

[11]According to executives of DirecTV and EchoStar, the provision of local broadcast stations to more cities by satellite will be limited because of rules—known as "must-carry rules"—included in the act that require DBS firms to include all broadcast signals in markets in which they choose to provide any broadcast signals. The must-carry rules take effect on Jan. 1, 2002.

# GAO's Cable Rate Model

The purpose of this appendix is to describe our model of cable rate-setting. In particular, we discuss (1) the conceptual development of the model, (2) the data used for the model, and (3) the estimation results of the model. See appendix III for a discussion of the nature of the franchise sample used in the model and data-processing tasks related to matching information across varied geographic contexts. See appendix IV for a table with descriptive statistics on variables included in the model.

## The Econometric Model

In response to a congressional request for a study examining the effects of DBS service on cable rates, we developed an econometric model to examine the influence of satellite penetration, among other factors, on the cable rates charged in a large sample of cable franchise areas in 1998. We surveyed the existing empirical literature on cable rates to develop a model that would appropriately analyze these issues. Relying on that literature and our assessment of the contemporary subscription video marketplace, we developed a model that included a variety of explanatory factors—or variables—that have been included in previous models but that also extends those analyses by adding new variables to account for the recent emergence of DBS as an important competitor to cable and for recent system upgrades among many cable firms.

### Examination of the Competitive Effects in the Subscription Video Market

In 1998, the national market share of cable systems—as measured by subscribership—in what we call the subscription video market was about 85 percent, and the share of the DBS carriers was about 12 percent. In the context of this market, cable operators can be thought of as the "dominant" distributors of video programming, while the other providers can be thought of as "fringe" suppliers. Therefore, to examine the competitive influence of DBS providers on cable rates, we employed a model based on the subscription video market, rather than on the narrower market for cable TV.[1]

[1]This is consistent with the FCC approach to analyzing cable rates. See FCC's *Fifth Annual Report*, "Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming," CS Dkt. No. 98-102, FCC 98-335 (released Dec. 23, 1998).

Our model is based on the generalized form of an economic model known as the "dominant firm-competitive fringe model."[2] Cable providers and satellite providers can be regarded as "differentiated," not so much because they use different technologies but because the services they provide are perceived to be different by subscribers and because these varied providers face different laws and regulations that influence their cost structures as well as the type of product they provide. For example, *Consumer Reports* reported that satellite subscribers were generally more satisfied with their services than were cable subscribers.[3] Also, cable companies must pay local franchise fees and are required to provide capacity for public, educational, and government channels. Satellite providers, on the other hand, had only a limited compulsory copyright license to provide broadcast channels during the period our model examined. In sum, cable and satellite providers are differentiated in consumers' perception, legal context, and their product offerings.

[2]Economists have traditionally used the dominant firm-competitive fringe model to analyze markets where there is a dominant firm and a competitive fringe of small firms. See, for example, H. Yamawaki, "Dominant Firm Pricing and Fringe Expansion: The Case of the US Iron and Steel Industry, 1907-1930," *Review of Economics and Statistics* (Aug. 1985), pp. 429-37. Moreover, the dominant firm-competitive fringe model provides an excellent theoretical link between economists' measure of market power and quantifiable variables such as market share and price elasticity of demand. This model is closely aligned with what has been dubbed the New Empirical Industrial Organization. See p. 36 of L. Blank, D. L. Kaserman, and J. W. Mayo, "Dominant Firm Pricing With Competitive Entry and Regulation: The Case of IntraLATA Toll," *Journal of Regulatory Economics*, 14 (1998), pp. 35-53. The authors used a generalized dominant firm-competitive fringe model to derive a fully reduced-form price equation for dominant carriers in the local exchange telephone toll market subject to regulation.

[3]Dec. 1999, p. 25.

Under a generalized dominant firm-competitive fringe model, cable rates will depend broadly on the demand and cost conditions affecting both the cable and noncable providers of subscription video services. A desirable attribute of this model framework was that we could incorporate the competitive influence of noncable providers—such as DBS firms—on cable rates. DBS providers represent the single largest competitor to cable operators, and industry reports indicate that in 1998, almost two thirds of new video subscribers were choosing satellite over cable. To measure the competitive influence of the noncable providers (the competitive fringe), we use the DBS share of video subscribers in each franchise area.[4] Because provisions of the 1988 Satellite Home Viewer Act (SHVA) constrained the provision of broadcast carriage by DBS providers in 1998, DBS providers may have been unable to fully compete with cable companies. The dominant firm-competitive fringe framework makes it possible for us to also incorporate this influence on cable rates.

## The Specification of Cable Rate Model

We believe our measure of DBS penetration provides an appropriate measure to investigate the competitive influence of DBS on cable rates. However, the issue of estimating the influence of DBS penetration on cable rates is complicated by the possibility that the level of DBS penetration in an area is itself determined, in part, by the level of cable rates in that area. One method of statistical estimation in this situation is to estimate a system of structural equations in which certain variables that may be simultaneously determined are estimated jointly. In previous studies that defined the market more narrowly to be cable television, equations for cable rates, the number of cable subscribers, and the number of cable channels have been estimated jointly.[5] To incorporate the influence of DBS on cable rates in the broader subscription video market, we also include an equation for DBS penetration. We therefore estimated the effect of DBS

[4]Blank, Kaserman, and Mayo measure the competitive presence of the fringe as the number of fringe firms. However, in the subscription video context, there are two DBS providers operating in every local market. Therefore, we cannot use the number of firms for this purpose because the number of firms does not vary across franchise areas. However, because there is variation across franchise areas in the degree of DBS penetration, we use the DBS share variable to measure the degree of competition cable operators face from noncable providers.

[5]See, for example, G. S. Ford and J. D. Jackson, "Horizontal Concentration and Vertical Integration in Cable Television Industry," *Review of Industrial Organization*, 12(4) (1997), pp. 501-18; and R. N. Rubinovitz, "Market Power and Price Increases for Basic Service Since Deregulation," *RAND Journal of Economics*, 24(1) (1993), pp. 1-18.

penetration on cable rates within a four-equation structural model in which cable rates, the number of cable subscribers, the number of cable channels, and the DBS share of the subscription television market (DBS penetration) are jointly determined.

One implication of this estimation technique is that the estimated effects that we report for the effect of DBS penetration on cable rates must be interpreted as direct effects on price. At the same time there are indirect effects of DBS on price wherein the effect on price works through its effect on other endogenous variables. For instance, the level of DBS penetration may influence a cable operator's decision about the number of channels to include in programming packages, which can in turn affect its cable rate. We later present a table with results from a reduced-form cable rate equation to show how the exogenous variables not included in the price equation affect cable rates.

Other findings of our model that we emphasize relate to the presence of nonprice competition. In particular, some key findings suggest that in response to DBS, cable companies increased the quality of their services—in particular, the number of channels that they offered consumers. Such nonprice competitive responses have been noted by many observers as a key aspect of the contemporary subscription video market, in addition to price competition.

We estimated the following four-equation structural model of the subscription television market:

- **Cable rates** are hypothesized to be related to (1) the number of cable channels, (2) the number of cable subscribers, (3) the DBS share of the subscription television market, (4) average wages, (5) regulation, (6) horizontal concentration, (7) vertical relationships, and (8) the presence of a nonsatellite competitor. The cable rate variable used in the model is defined as the total monthly rate charged by a cable franchise to the "typical subscriber," including fees paid for the most commonly purchased programming tier and rented equipment (a converter and remote).[6] The explanatory variables in the cable rate relationship are essentially cost and market structure variables.

- **Number of cable subscribers** is hypothesized to be related to (1) cable rates (per channel), (2) DBS share, (3) the number of broadcast channels, (4) urbanization, (5) the age of the cable system, (6) homes passed by the cable system, (7) median income, and (8) the presence of a nonsatellite competitor. The number of cable subscribers is defined as the number of subscribers in a franchise area that subscribe to the most commonly purchased programming tier. This represents the demand equation for cable services, which depends on rates and other demand-related factors.

- **Number of cable channels** is hypothesized to be related to (1) the number of cable subscribers, (2) DBS share, (3) median income, (4) system megahertz, (5) the extent of multiple dwelling units, (6) vertical relationships, and (7) the presence of a nonsatellite competitor. The number of cable channels is defined as the number of channels included in the most commonly purchased programming tier. The number of cable channels can be thought of as a measure of cable programming quality and is explained by a number of factors that influence the willingness and ability of cable operators to provide high-quality service and consumers' preference for quality.

[6]The price paid for cable services should reflect their value to the customer. A higher cable rate may be due to the higher quality or value of the services provided. One of the ways to measure the value of cable services, albeit, an imperfect one, is to use the cable rate per channel; see, for example, "Report on Cable Industry Prices," MM Dkt. No. 92-266, FCC 99-091 (May 7, 1999), p. 7. Our key results were unchanged when we used the cable rate per channel as the dependent variable. In our model, we used the number of channels to capture the idea that higher cable rates may be due to higher quality or value resulting from the availability of more channels.

- **DBS share of subscription television market** is hypothesized to be related to (1) cable rates, (2) the age of cable system, (3) median income, (4) system megahertz, (5) dummy variable for areas outside metropolitan areas, (6) regulation, and (7) the presence of a nonsatellite competitor. The DBS variable is defined as the number of DBS subscribers in a franchise area expressed as a share or proportion of the total subscription video market in the area (that is, DBS subscribers plus cable subscribers). As hypothesized, the DBS share is expected to depend on the rates set by the "dominant" cable providers as well as on the demand, cost, and regulatory conditions in the subscription video market that directly affect DBS.

Several of the explanatory variables in our model have been used in previous studies of cable rates.[7] The explanatory variables included in those studies fall into two general categories: demand and cost factors, and market structure and regulatory conditions. Table 1 presents the expected effects of all the explanatory variables in the structural model on cable rates and notes whether a variable has been used previously in cable rate studies. Table 2 presents a description of some variables in the model that provide evidence on price and nonprice competition occurring in the market.

**Table 1: Expected Effects of All Explanatory Variables on Cable Rates**

| Explanatory variable | Expected effect on cable rates | Included in previous studies |
|---|---|---|
| Number of channels | Consumers will be willing to pay more for a greater number of channels. Also, costs are greater for the cable operator to provide more channels. | Yes |
| Number of subscribers | Costs per subscriber of providing cable services can increase or decrease with the number of subscribers, depending on scale economies. | Yes |
| Average wages | Areas with higher average wages have higher costs of operation, which will make cable rates higher. | Yes |

[7]See, for example, R. W. Crandall and H. Furchtgott-Roth, *Cable TV: Regulation or Competition?* (Washington, D.C.: Brookings Institution, 1996); W. M. Emmons III and R. A. Prager, "The Effects of Market Structure and Ownership on Prices and Service Offerings in the U.S. Cable Television Industry," *RAND Journal of Economics*, 28(4) (Winter 1997), pp. 732-750; Ford and Jackson (1997); J. W. Mayo and Y. Otsuka, "Demand, Pricing, and Regulation: Evidence from the Cable TV Industry," *RAND Journal of Economics*, 22(3) (1991), pp. 396-410; and Rubinovitz (1993).

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| Explanatory variable | Expected effect on cable rates | Included in previous studies |
|---|---|---|
| Regulation[a] | Regulation may be associated with lower cable rates when compared with rates that would prevail under profit-maximizing pricing by monopoly cable systems. However, cable rates could be higher under regulation if the unregulated cable systems are more competitive. | Yes |
| Horizontal concentration | This market structure variable denotes whether a franchise area is operated by a large national multiple system operator (MSO). If large MSOs have some cost advantages, rates could be lower; if MSO ownership imposes competitive disadvantages to potential entrants, cable rates could be higher. | Yes |
| Vertical relationship | This market structure variable captures the effects of vertical ownership ties between cable companies and cable programming networks. The expected effect of the variable is not clear because a vertical relationship could lower cable system costs if programming costs are reduced or efficiencies are gained, but vertical relationships could signify market power that would tend to lead to higher cable rates. | Yes |
| Presence of nonsatellite competitor | This competitive variable signifies whether a cable company faces direct competition from another cable operator (including, for example, a local exchange telephone carrier offering cable services) or a wireless cable company in part or all of its franchise area. Few cable companies face such competition, but rates should be lower when they do. | Yes |
| DBS share of the subscription television market | We expect the presence of DBS to restrain cable rates if cable and satellite were close substitutes in 1998. However, because of the provisions of the law at that time, DBS providers could not provide local broadcast signals to many of their subscribers, so the competitive pricing pressure on cable rates may not have been great then. | No |
| Number of broadcast channels | Consumers will pay more for a greater number of broadcast channels on the cable system. | Yes |
| Urbanization | Consumers will have a lower demand for cable services in more urban settings that have many alternative forms of entertainment competing with cable, which will lead to lower cable rates. | Yes |
| Age of cable system | Subscribers have a higher demand in franchise areas with older cable systems because they are more likely to be aware of the availability and quality of the cable system. Therefore, cable rates will be higher. | Yes |

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| Explanatory variable | Expected effect on cable rates | Included in previous studies |
|---|---|---|
| Homes passed by cable system | A higher number of homes passed means a greater potential market size and, therefore, higher demand leading to higher cable rates. Conversely, the costs of operations could increase with the number of homes passed since the scale of operations will be larger—however, the costs per subscriber should decline if there are scale economies. | Yes |
| Median income | As consumers' incomes rise, demand for cable services should increase, which will increase cable rates. | Yes |
| System megahertz[b] | Higher-megahertz systems may enable the provider to offer more channels and to bundle several services together—video, voice, and high-speed Internet access. This could increase demand for cable, leading to higher rates; or cable rates may be discounted to attract consumers to the other (new) services. Conversely, lower cost of operations could arise with new technology, which will lead to lower cable rates. | No |
| Extent of multiple dwelling units | Where there are more multiple dwelling units, the market has been found to be more naturally competitive because cable systems may face greater actual or potential competition, which will lead to lower cable rates. | Yes |
| Nonmetropolitan areas | We expect the competitive impact of DBS on cable rates to be stronger in franchise areas that lie outside of metropolitan statistical areas. | Yes |

[a]The basic service tier (and equipment) is regulated by municipal franchising authority (which is a state or local entity empowered by federal, state, or local law to grant a franchise). FCC's authority to directly regulate rates for the expanded basic tier expired on Mar. 31, 1999; see CS Report No. 99-5, NRCB 9005, FCC (released Mar. 29, 1999).

[b]It is possible that cable operators upgrade to higher megahertz to meet competition from nonsatellite or satellite competitors.

**Table 2: Price and Nonprice Competition Relationships in Model**

| Explanatory variable | Equation | Expected effect |
|---|---|---|
| Cable rate | DBS share | We expect higher cable rates to be associated with higher DBS share if high cable prices induce consumers to migrate to DBS from cable or if cable and DBS are close substitutes. |
| System megahertz | DBS share | We expect more capacity to be associated with lower DBS share if cable providers are able to offer more channels and bundled services—telephony and high-speed Internet services. |
| Nonmetropolitan area status | DBS share | We expect nonmetropolitan status to be associated with higher DBS share if DBS is a closer substitute for cable in nonmetropolitan areas, owing to, for instance, "line of sight" and SHVA considerations. |
| DBS share | Number of cable channels | We expect higher DBS shares to be associated with more cable channels if cable providers increased channels to meet competition from DBS. |

## Data Sources

We required several data elements to build the data set used to estimate this model. The following is a list of our primary data sources. (App. III discusses two data issues in greater detail: (1) FCC's stratified sample design for its cable franchise survey and (2) how we matched data across varied sources when geographic boundaries for data did not match.)

- We obtained data on cable rates and service characteristics from the 1998 survey of cable franchises that FCC conducted as part of its mandate to report yearly on cable competition. FCC's survey asked a sample of franchise areas to provide information about a variety of items pertaining to cable rates, service offerings, subscribership, franchise area reach, franchise ownership, and system capacity. We used the survey to define measures of each franchise area's cable rates, number of subscribers, and number of cable channels as described above. In addition, we used the survey to define variables measuring (1) the number of broadcast television channels, (2) system age—the number of years since the cable system went online, (3) system megahertz—the capacity of the cable system in megahertz, (4) homes passed by the cable system serving the franchise area and perhaps other franchises in the same area, (5) regulatory status—a dummy equal to 1 if in 1998 the basic service tier was regulated by a local franchise authority or FCC was regulating the cable programming service tier, and (6) competitive status—a dummy variable equal to 1 if the franchise faced "nonsatellite" competition from an unaffiliated subscription video company (or "overbuilder") or from a local exchange telephone company.

- FCC also provided satellite subscriber counts as of 1998 for each zip code in the United States.[8] We used this information to calculate the number of DBS subscribers in a cable franchise area, which, when used in conjunction with the number of cable subscribers, was used to define DBS share. The data actually includes other satellite subscribers—such as C-band users. However, we refer to the variable as DBS throughout the report.

- We used the most recent data from the Census of Population (1990) to obtain the following demographic information for each franchise area: median household income, proportions of urban and rural populations, proportion of housing units accounted for by structures with more than five units (multiple dwelling units), and nonmetropolitan statistical areas.

[8]The satellite subscriber counts also include C-band and medium-power satellite subscribers. The number of these subscribers has been declining in recent years, in part because of the growth of DBS.

- We used state-level information collected by the Bureau of Labor Statistics on the average weekly wages for cable television employees.

- To define the dummy variable indicators of vertical integration and large MSOs, we used information on the corporate affiliations of the franchise operators provided in FCC's master file of franchises. To define the indicator of vertical integration, we then used this information in conjunction with industrywide information on vertical relationships between cable operators and suppliers of program content gathered by FCC in its 1998 annual video report. To define the indicator of large MSOs, we compared the information on corporate affiliations against a list maintained by the National Cable Television Association that ranks the largest MSOs. Cable franchises affiliated with one of the 10 largest MSOs received a value of 1.

## Estimation Methodology and Results

We employed Three-Stage Least Squares (3SLS) to estimate our model.[9] The majority of the results are consistent with our expectations and with findings of previous studies. We also performed various diagnostics to test the stability of our model results. None of these tests implied that the results we report were highly sensitive to model specification, the nature of the stratified sample, or to measurement of key variables included in the model.

[9]We preferred the 3SLS to Two-Stage Least Squares (2SLS) because the 3SLS accounts for the contemporaneous relationships among cable rates, cable subscribers, cable channels, and DBS penetration by using all available information. Our results for the 3SLS and the 2SLS are generally similar. Also, we assumed that price per channel in the subscriber equation is exogenous because cable providers simultaneously decide how many channels to provide and what to charge for a package of channels, rather than deciding how much to charge for each channel. However, considering that price and channels are endogenous in the model, we considered the possibility that price per channel might also be appropriately considered as an endogenous variable. The overall results under this assumption were substantively the same as our base-case model results.

## Estimation Results

Table 3 includes the estimation results for each of the four structural equations. All the variables, except dummy variables,[10] are expressed in natural logarithmic form.[11] This means that coefficients can be interpreted as "elasticities"—the percentage change in the value of the dependent variable associated with a 1-percent change in the value of an independent, or explanatory, variable. The coefficients on the dummy variables are elasticities in decimal form.[12] Most of our results are consistent with the economic reasoning that underlies our model as well as with the results from several previous studies. We compare our findings concerning various influences on cable rates with those found in previous empirical studies.

**Table 3: 3SLS Model Results**

| Variable | Cable rates equation | Cable subscribers equation | Cable channels equation | DBS share equation |
|---|---|---|---|---|
| Cable rate | | -3.2222 [0.0001][a] | | 0.1984 [0.7924] |
| Cable channels | 0.1687 [0.0007][a] | | | |
| Cable subscribers | 0.0363 [0.0006][a] | | 0.1321 [0.0001][a] | |
| DBS share | 0.0876 [0.0030][a] | -1.2653 [0.0001][a] | 0.1767 [0.0250][b] | |
| Broadcast channels | | 0.2087 [0.0015][a] | | |
| Average wages | 0.0246 [0.4159] | | | |
| Regulation | 0.0302 [0.0539][c] | | | -0.6991 [0.0001][a] |
| Median income | | -0.0487 [0.0083][a] | 0.1133 [0.0088][a] | 0.2041 [0.1245] |

[10]A dummy variable takes a value of 1 if a certain characteristic is present and a value of 0 otherwise.

[11]The dummy variables in the model include the following: horizontal concentration of cable systems, vertical relationship, regulation, overbuilders and local exchange telephone companies, and metropolitan statistical area. Also, because the natural log of 0 is undefined, we added 1 to the observed value of any continuous variable that can take the value of 0.

[12]That is, 0.10 means 10 percent.

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| Variable | Cable rates equation | Cable subscribers equation | Cable channels equation | DBS share equation |
|---|---|---|---|---|
| Horizontal concentration | 0.0879 [0.0056][a] | | | |
| Vertical relationship | -0.0690 [0.0401][b] | | -0.0542 [0.0299][b] | |
| Presence of nonsatellite competitor | -0.0702 [0.0093][a] | -1.5471 [0.0001][a] | 0.1777 [0.0055][a] | -0.8843 [0.0001][a] |
| Nonmetropolitan areas | | | | 0.4724 [0.0001][a] |
| Urbanization | | 0.0354 [0.0116][b] | | |
| Extent of multiple dwelling units | | | 0.0074 [0.0657][c] | |
| Age of cable system | | 0.2445 [0.0077][a] | | -0.4596 [0.0001][a] |
| Homes passed by cable system | | 0.3093 [0.0001][a] | | |
| System megahertz | | | 0.2200 [0.0001][a] | -0.6109 [0.0001][a] |
| Sample size | 698 | 698 | 698 | 698 |

Notes: System-weighted R-square: 0.62.

P-values are in square brackets.

[a]Significance at the 1-percent level.

[b]Significance at the 5-percent level.

[c]Significance at the 10-percent level.

We did not find that greater DBS penetration was associated with lower cable rates. In fact, as shown in table 3, we found that the direct effect of DBS penetration on cable rates was positive and significant. This finding suggests that, in 1998, DBS penetration did not translate into significant pricing pressure on cable providers. In addition, the results of our primary specification, shown in table 3, do not suggest that cable prices influenced the level of DBS market share.[13] However, the results of alternative specifications suggest that such an effect does hold. Thus, we find some

[13]In particular, we found that cable price was significant in the DBS market share equation only when the number of cable channels was included as an explanatory variable in the equation.

evidence that subscribers migrate to DBS in locations with higher cable rates.

We also found strong evidence of nonprice competition in response to increased DBS penetration. For instance, in the cable channels equation, we found that DBS share is positively related to the number of cable channels. This result is consistent with the view that cable operators responded to DBS competition by increasing the number of channels they offered. Correspondingly, in the DBS share equation, we found that cable system megahertz was negatively related to DBS share. This is consistent with the notion that where cable operators have invested to upgrade their systems, DBS represented a smaller share of the subscription video market, thereby limiting the competitive impact of DBS on cable rates. Also, in the cable subscribers' equation, we obtained an estimate of the price elasticity of demand for basic cable services that was much greater (in absolute value) than found in previous estimates.[14] This is consistent with the view that the subscription video market now has more substitutes, making the market generally more competitive.

Several conditions existed in 1998 that suggest rural subscribers may have viewed DBS as a closer substitute for cable. For example, in urban and suburban areas, satellite companies have technical problems with installing a satellite dish that is able to "see" the appropriate satellite because of foliage or tall buildings that block the necessary line of sight between the reception dish and the satellite. And finally, because the law in 1988 provided DBS companies with a copyright license to provide broadcast signals to households in "unserved" areas but not elsewhere, it may be that in some rural areas that came under the "unserved" definition, DBS actually operated as a very close substitute for cable because some of these subscribers were already receiving broadcast signals. We therefore expected a nonmetropolitan status dummy to be positively related to DBS share, reflecting more intense competition from DBS. In fact, in the DBS equation, DBS penetration was estimated to be about 50 percent higher in

[14]The price elasticity of demand is estimated to be –3.22, which is highly elastic; this means that a 1-percent decrease in cable rates results in a 3.22-percent increase in the quantity demanded of cable. In previous studies, Mayo and Otsuka (1991), using 1982 data, found the price elasticity to be between –0.69 to –1.51; Rubinovitz obtained a value of –1.46 between 1984 and 1990; and Ford and Jackson (1997) estimated the value to be –2.41 in 1994. The estimates of the price elasticity of basic cable demand have been increasing over time, which is an indication of the declining market power of cable systems.

nonmetropolitan areas. This suggests that the competitive influence of DBS was greater in nonmetropolitan areas in 1998.

Finally, we present a reduced-form cable rate equation (see table 4) in which all exogenous variables in the system are included to show the net effects on cable rates of the exogenous variables. For example, these results show that the number of broadcast channels—included in the cable subscriber equation—is associated with higher cable rates. Also, these results show that cable systems that have been in place longer tend to have higher rates. The age of the cable system was included in the subscriber and the DBS share equations.

**Table 4: Regression Estimates of Reduced-Form Cable Rates Equation**

| Variable | Cable rates equation |
|---|---|
| Cable rate | NA |
| Cable channels | NA |
| Cable subscribers | NA |
| DBS share | NA |
| Broadcast channels | 0.0329<br>[0.0004][a] |
| Average wages | 0.0323<br>[0.3023] |
| Regulation | 0.0268<br>[0.0456][b] |
| Median income | 0.0022<br>[0.9138] |
| Horizontal concentration | 0.0921<br>[0.0065][a] |
| Vertical relationship | -0.1069<br>[0.0017][a] |
| Presence of nonsatellite competitor | -0.0984<br>[0.0001][a] |
| Nonmetropolitan areas | -0.0930<br>[0.0001][a] |
| Urbanization | -0.0086<br>[0.0001][a] |
| Extent of multiple dwelling units | -0.0004<br>[0.8259] |
| Age of cable system | 0.0250<br>[0.0215][b] |

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| Variable | Cable rates equation |
|---|---|
| Homes passed by cable system | 0.0264 [0.0001][a] |
| System megahertz | 0.0359 [0.1118] |
| Sample size | 698 |

Notes: R-square: 0.25.

NA means not applicable.

The p-values are based on consistent covariance estimates. See, H. White, "A Heteroscedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroscedasticity," *Econometrica* (48) (1980), pp. 817-38.

[a]Significance at the 1-percent level.

[b]Significance at the 5-percent level.

## Diagnostic Tests of Regression Results

The results obtained from a regression model can be sensitive to the sample design and how the model is specified. A potential concern involves the use of stratified sampling. FCC used a complex sampling design (see app. III for a further discussion of the sample design) to gather information on cable franchise areas. We investigated whether our results were sensitive to the stratification of the sample by investigating the stability of the coefficients across the strata for a key variable (specifically, DBS share) in the cable rate equation and believe that our results are not influenced by the sampling design. We report these results in table 5. The estimated DBS share effects were similar in the competitive and noncompetitive strata. This is particularly important because the overall model results do not appear to be driven by the competitive subsample of cable franchises, which were, by design, overrepresented in the FCC sample in comparison with their numbers in the universe of franchises. The estimated DBS share effects were insignificant in all of the size-related strata. This could mean that DBS shares were related to the stratification scheme—for example, larger systems tend to be more urban and may have lower average DBS penetration—in such a way that there was insufficient variation within the strata to establish a significant relationship between DBS share and cable rates. This suggests that the overall results were not driven by the results of a particular size-related stratum.

The effect of DBS was the primary focus of this model. Because we hypothesized that DBS penetration levels could differ across different kinds of markets—in particular, metropolitan and nonmetropolitan markets—we included a dummy measure of nonmetropolitan status in the

DBS equation to test this hypothesis. As an alternative, we used a continuous variable—population density—in the DBS share equation. Model results using this alternative specification also supported our finding that DBS penetration was more pronounced in nonmetropolitan areas than it was in metropolitan areas.

We also investigated the extent to which our model results were sensitive to the inclusion of those franchise areas with very high DBS penetration. We did this because our model was based on the assumption that the cable franchise was the "dominant" provider of subscription video services, but this assumption may not always hold at the level of the individual franchise. However, when we excluded observations with DBS market shares exceeding 30 percent, our overall results were quite similar (based on a sample of 618 franchises).

**Table 5: Regression Estimates for Cable Rates, Sample Strata Analysis**

| Variable | Full sample | Competitive | Noncompetitive | Large | Medium | Small |
|---|---|---|---|---|---|---|
| Cable channels | 0.1687<br>[0.0007][a] | 0.4398<br>[0.0001][a] | 0.1680<br>[0.0036][a] | 0.1106<br>[0.0392][a] | 0.1745<br>[0.0804][a] | 0.2774<br>[0.0016][a] |
| Cable subscribers | 0.0363<br>[0.0006][a] | -0.0485<br>[0.0302][a] | 0.0401<br>[0.0001][a] | 0.0033<br>[0.5969] | 0.0057<br>[0.7183] | -0.0165<br>[0.6037] |
| DBS share | 0.0876<br>[0.0030][a] | 0.0977<br>[0.0001][a] | 0.0670<br>[0.0825][a] | -0.0128<br>[0.2854] | 0.0607<br>[0.1313] | 0.0200<br>[0.7370] |
| Average wages | 0.0246<br>[0.4159] | -0.0508<br>[0.3112] | 0.0428<br>[0.1754] | 0.0483<br>[0.0797][a] | -0.0671<br>[0.2417] | 0.1296<br>[0.2066] |
| Regulation | 0.0302<br>[0.0539][a] | 0.1533<br>[0.0001][a] | -0.0135<br>[0.3759] | -0.0239<br>[0.0724][a] | 0.0784<br>[0.0032][a] | 0.0314<br>[0.4985] |
| Horizontal concentration | 0.0879<br>[0.0056][a] | 0.0253<br>[0.5691] | 0.0760<br>[0.0280][a] | 0.0992<br>[0.0152][a] | 0.0927<br>[0.0433][a] | 0.0749<br>[0.5422] |
| Vertical relationship | -0.0690<br>[0.0401][a] | 0.0438<br>[0.3480] | -0.0788<br>[0.0292][a] | -0.1191<br>[0.0046][a] | -0.0874<br>[0.0697][a] | -0.0230<br>[0.8126] |
| Presence of nonsatellite competitor | -0.0702<br>[0.0093][a] | NA | NA | -0.1264<br>[0.0001][a] | -0.0973<br>[0.0146][a] | -0.1448<br>[0.0612][a] |
| Sample | 698 | 224 | 474 | 287 | 253 | 158 |

Notes: The values reported are the coefficients; p-values are in square brackets.

[a]Significant at the 10-percent level or less.

# Further Issues Pertaining to the Data Used in GAO's Cable Rate Model

This appendix provides further information on two issues pertaining to the data used in the cable rate model. First, we provide details about the FCC sample of franchise areas and our use of that data. Second, we describe how we linked information from these franchise areas—which represent a wide range of community types—to other data that we used. That is, we describe how we combined various data sources that were reported across varied geographic coverage areas.

## FCC Employed a Stratified Sampling Design to Survey Franchise Areas, but the Sample Selection of Noncompetitive Areas May Not Represent the Universe of Noncompetitive Areas

Because there are a very large number of cable franchise areas in the United States—roughly 30,000—FCC selected a sample of these areas for the analysis of cable competition it is required under law to conduct annually.[1] FCC used a complex sampling design to select the cable franchises it surveyed. Because of its focus on competitive issues, FCC sent a survey to all 286 franchise areas in which the cable system was found to face "effective competition."[2] For the remaining "noncompetitive" franchises—which constitute about 99 percent of all franchise areas—FCC used a stratified sample. Noncompetitive cable franchise areas were assigned to size groups, or strata, according to the number of subscribers in the cable system with which each franchise was affiliated. The largest group contained cable systems with 50,000 or more subscribers, the medium group contained systems with between 10,000 and 49,999 subscribers, and the smallest group contained systems with fewer than 10,000 subscribers. FCC sampled a higher proportion from the largest group than it did from the medium group and a larger proportion of the medium group than of the small group. A key goal of this sampling design was to ensure that, in comparison to what was likely to have occurred under a simple random sample, the survey would include many more of the competitive franchises as well as franchises from the larger systems from which more consumers receive service.

FCC's sampling procedure produced a sample of franchise areas that overrepresented larger franchise areas within some of the size strata. In particular, we found that most of the larger franchise areas within some of

[1]Cable Television Consumer Protection and Competition Act of 1992.

[2]There are four tests for effective competition in a cable franchise area under the 1992 Cable Act: (1) low penetration by cable operators in the franchise area; (2) competition between two or more unaffiliated subscription video competitors (also called overbuilders); (3) operation of the cable system by a municipal franchising authority; and (4) competition from local exchange telephone carriers.

the strata were selected into the sample. As a consequence, the average number of subscribers for the sample of franchises for two of the strata are much larger than the average number of subscribers for those strata in the universe of franchises. While this calls into question the overall representativeness of the FCC sample, we found that model results, as reported in table 5, were reasonably consistent—particularly for the DBS variables—across strata. This suggests that the nonrepresentativeness of the sample is not a critical problem for our estimated results. The sample of franchises we used to estimate the model accounts for over 17 million of the approximately 65 million cable subscribers in 1998, or about 26 percent of all subscribers.

Of the data we received from FCC, we were not able to use the information for all of the 783 franchise areas that responded to FCC's survey. Not all of them provided answers to all of the questions on the survey, and we could not successfully merge demographic data from other data sources with some franchise areas. We also excluded two franchise areas in Hawaii because DBS service as envisioned in our model was not provided in Hawaii in 1998. As a consequence, we were able to use observations on 698 cable franchise areas in estimating the model.[3] Table 6 provides information, by strata, on the number and type of cable franchises nationally, the number surveyed by FCC, and the number we were able to include in our analysis.

[3]We found little evidence that the cable franchise areas that we were not able to include in the analysis for whatever reason differed systematically from the cable franchise areas that we were able to include. For example, the average cable rate for the included franchise areas was $29.71, and the average rate for the excluded franchise areas was $30.20. The average DBS share for the included franchise areas was 12.2 and was 12.48 for the excluded franchise areas. Nonmetropolitan franchises made up 19 percent of the included franchise areas and 31 percent of the excluded franchise areas.

**Table 6: FCC Sample and GAO Data Set**

| Type of franchise | Number of franchises | | | |
|---|---|---|---|---|
| | In universe | Surveyed by FCC | Responding to FCC survey | With responses to all survey and nonsurvey variables used in GAO model |
| Competitive | 286 | 286 | 253 | 224 |
| Noncompetitive | 29,595 | 560 | 530 | 474 |
| Large | 3,145 | 289 | 265 | 247 |
| Medium | 7,046 | 190 | 186 | 163 |
| Small | 19,404 | 81 | 79 | 64 |
| **Total** | **29,881** | **846** | **783** | **698** |

Source: FCC and GAO.

## Boundaries of Franchise Areas Do Not Always Relate Easily to Other Geographic Definitions

To match data from franchise areas with other data, the geographic boundaries of each franchise had to be determined to match them against other geographic areas, such as counties or towns. We were able to define the boundaries of many franchise areas using information in the survey and in other FCC records, but for some franchise areas, there was not enough information to easily determine their true geographic extent.[4] This problem with insufficient information occurred in several contexts. Where multiple franchises existed in a jurisdiction, particularly in unincorporated areas of counties[5] and in large cities,[6] we acquired additional information on the franchises' boundaries or used allocation rules to estimate the geographic

[4]Our general approach was to identify the geographic extent of each franchise area by combining the community name field with an indicator of community type and matching this name to census place or county subdivision (minor civil division) files.

[5]For those franchise areas in which the community type was identified as "county," we attempted to first identify whether other franchises in that county were identified with particular places and, if so, to approximate that area of the county that was not contained in these other franchise areas. For purposes of assigning demographic information, however, we used county-level data for these franchises.

[6]Many large cities have multiple cable franchise areas. For instance, Los Angeles has 14, New York City has 9, and Chicago has 5 franchise areas and 7 franchises.

context and retain the franchise areas in the sample.[7] However, in some other contexts, we were unable to retain franchise areas. In particular, some observations had an associated community type that was listed as a recognizable census term, such as town or city, but no census place or county subdivision[8] could be matched. Also, some franchise areas were associated with a community type that was not recognizable in terms of census geography.[9]

[7]For those jurisdictions for which there were multiple franchises, we attempted to define more precise geographical boundaries for each franchise area, especially in larger cities. Specifically, we contacted local government offices responsible for cable franchise oversight and received maps or other information linking the specific franchise areas to zip codes, census tracts, local government districts, or some other boundary information. When local governments did not directly provide zip code or census tract information, we used the information they did provide in conjunction with zip code overlay maps to assign zip codes to the franchise areas. We then used census data at either the zip code or census tract level to calculate the demographic measures associated with each franchise area.

[8]Places consist of what are known as census-designated places and places that are incorporated according to the laws of their respective states. Generally, incorporated places can be thought of as cities, boroughs, towns, townships, and villages. However, towns and townships in some states are not considered places in terms of census reporting, even though they might both serve some local government purpose and have large populations. Census data for many franchise areas designated as towns in the franchise master file are found in the county subdivisions file rather than the places file.

[9]For instance, FCC has a category called "unincorporated area adjacent to an incorporated community" that can describe a situation in which a cable system primarily designed to serve a particular jurisdiction may spill over into an unincorporated part of the county and serve a small number of homes that are more easily connected to that system than to another system that serves other portions of the county.

The satellite subscriber information we used to calculate our measure of DBS penetration was organized by zip code, and because zip codes often do not share boundaries with other geographies, we had to relate the zip code data to our set of franchise areas. Because different places (in this context, cable franchise areas) can share the same zip code, we needed to identify different franchise areas that might share the same zip code in order to accurately calculate the degree of satellite penetration in each franchise area. For most franchise areas—that is, those that correspond to census places, county subdivisions or entire counties as well as those franchises in multiple-franchise jurisdictions for which we were able to identify franchise boundaries—we accomplished this directly by using software designed to relate varied geographic units to one another.[10] In this way, we were able to identify each zip code that was associated with a particular place (or county, county subdivision, or census tract) and to find the share of each zip code's population that was contained in that area. We then used these population shares to allocate shares of each zip code's total satellite subscribers among franchises.[11] For other multiple-franchise jurisdictions for which we did not have more precise franchise boundaries, we first determined the total number of satellite subscribers in zip codes associated with those jurisdictions, and then allocated subscribers to each franchise area on the basis of the number of franchises in the place.[12]

[10]In particular, we used the MABLE/Geocorr correspondence engine (http://www.census.gov/plue). MABLE is an acronym for Master Area Block Level Equivalency file. The code was developed by John Blodgett, senior programmer/analyst at the University of Missouri St. Louis, under contract with CIESIN/SEDAC, and is jointly owned by John Blodgett and CIESIN.

[11]As an illustration, assume we have a cable franchise area that corresponds to the town of Anytown, which is served by zip code 12345. Assume further that zip code 12345 had a population of 10,000 people in 1990, of which 8,000 were in Anytown proper and 2,000 were in the surrounding area. In this case, 80 percent of the zip code population is associated with Anytown, so that our approach would assign 80 percent of the satellite subscribers in zip code 12345 to the cable franchise in the town of Anytown.

[12]For each county-type franchise area, we had already approximated that area of the county that was not contained in these other franchise areas and calculated the number of satellite subscribers in the zip codes associated with that portion of each county.

# Descriptive Statistics for Variables Included in GAO's Cable Rate Model

Table 7 provides basic statistical information on all of the variables included in the cable rates model. We calculated these statistics using all 698 observations in the GAO data set.

**Table 7: Table of Descriptive Statistics**

| Variable | Mean | Standard deviation | Minimum value | Maximum value |
|---|---|---|---|---|
| Total monthly cable TV rate paid by a "typical" subscriber, June 1998 (dollars) | 29.71 | 4.54 | 10.95 | 42.07 |
| Number of cable subscribers | 24,102.3 | 37,920.6 | 1 | 293,774.0 |
| Number of cable channels | 50 | 14 | 10 | 103 |
| Number of local broadcast channels | 10 | 4 | 0 | 23 |
| Urbanization (percentage) | 64.58 | 45.82 | 0 | 100 |
| Age of cable system (years) | 20.80 | 9.52 | 1 | 47 |
| Homes passed | 117,774 | 153,928 | 123 | 1,031,023 |
| Median household income (dollars)[a] | 40,495 | 14,262 | 12,815 | 131,648 |
| Average weekly wages (dollars)[b] | 682 | 146 | 414 | 1,074 |
| System megahertz | 537 | 163 | 220 | 900 |
| Regulation | 0.48 | 0.50 | 0 | 1 |
| Horizontal concentration | 0.43 | 0.49 | 0 | 1 |
| Vertical relationships | 0.40 | 0.49 | 0 | 1 |
| Extent of multiple dwelling units (percentage) | 17.27 | 14.03 | 0 | 95.66 |
| Presence of nonsatellite competitor | 0.11 | 0.32 | 0 | 1 |
| DBS share of subscription television market (percentage) | 12.21 | 18.15 | 0.02 | 97.71 |
| Nonmetropolitan area status | 0.19 | 0.43 | 0 | 1 |

[a]1989 median household income, expressed in 1998 dollars using Consumer Price Index-All Urban Consumers.

[b]1997 wages, expressed in 1998 dollars using the Consumer Price Index-All Urban Consumers.

# Comments From the Federal Communications Commission

Note: GAO comments supplementing those in the report text appear at the end of the appendix.

Federal Communications Commission
Washington, D.C. 20554

June 26, 2000

Mr. Stanley J. Czerwinski
Associate Director, Housing and
Telecommunications Issues
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Czerwinski:

Thank you for the opportunity to review GAO's draft report entitled Telecommunications: The Effect of Competition from Satellite Providers on Cable Rates (GAO/RCED-00-164). It is my understanding that you have met with the Commission staff and received data, comments, and assistance from them.

See comment 1.

See comment 2.

See comment 3.

See comment 4.

We have two primary comments on the draft report. First, we recommend that GAO clarify one of its conclusions in the report, specifically, the conclusion that DBS did not exert significant pressure on cable companies to reduce rates during 1998. As we read the report, the basis for this conclusion is an econometric study indicating that cable rates were somewhat higher in areas with greater DBS penetration. However, the results could also be interpreted as showing that when cable rates are high, more people switch to DBS. When viewed in this light, the results indicate that DBS, in some instances, does provide an important multichannel alternative to cable. We believe this conclusion should be highlighted in the report.

We also recognize that data limitations may have hampered your efforts to investigate the relationship between cable rates and DBS. The lack of geographic variation in DBS availability made your task more difficult. Additionally, time series data would have been useful in order to relate current period cable rates to previous period DBS penetration, or to relate changes in cable rates to changes in DBS penetration. Even without this additional data, however, it is not clear to us whether the positive coefficient on a DBS penetration variable in an equation explaining cable rates supports the conclusion that DBS did not exert pricing pressure on cable companies. Finally, we also have concerns about the econometric specification of the model, based in part on our belief that DBS penetration not only influences cable rates but also is influenced by them.

We appreciate very much the opportunity to review and comment on the draft report.

Sincerely,

Andrew S. Fishel
Managing Director

## GAO's Comments

1. We do not believe that we need to further clarify our finding that DBS did not exert significant pressure on cable companies to reduce rates in 1998. We believe we discuss in sufficient detail and with sufficient prominence the issue of disentangling two possible relationships between cable rates and DBS penetration: (1) the "competitive" effects of DBS share on cable rates and (2) the "switching" or "migration" effects that can occur if high cable rates lead subscribers to drop their cable in favor of DBS. We tested the first of these relationships by including the DBS penetration variable in the cable rates equation of the model and the second relationship by including cable rates in the DBS equation of the model.

   We also note that FCC stated in its recently released report on 1999 cable industry prices that it "sought information on the number of DBS subscribers in each surveyed cable franchise area in order to determine if DBS penetration has had an effect on the demand for cable as well as on the monthly charges for cable service." Although FCC does not examine whether DBS penetration has an effect on cable rates, its recent study does examine whether DBS penetration influences the demand for cable services. FCC finds no significant statistical relationship between DBS penetration and cable demand and provides an interpretation that is very similar to our own: "… that DBS exerts only modest influence on the demand for cable services." (See FCC, *Report on Cable Industry Prices*, June 9, 2000, p. 37.) Ultimately, we believe that our results are fundamentally consistent with FCC's own views.

2. We agree with FCC that DBS provides an important multichannel alternative to cable. However, we believe our report sufficiently presents this issue. First, we note that our empirical findings suggest that the presence of DBS led to important nonprice competition as cable companies in areas with high DBS penetration offered consumers more channels. Second, we note that DBS penetration is much higher in rural areas—supporting our hypothesis that DBS and cable services were seen as more substitutable products in rural areas in 1998. Finally, we suggested that DBS and cable will become viewed as more similar services in the future because of the ability of DBS providers to now offer local broadcast signals as part of their programming packages.

3. We agree that more detailed data enables an analyst to study issues with greater clarity. However, our cross-sectional analysis, which is

based on variations in cable rates and DBS penetration across nearly 700 franchise areas, allowed us to reasonably investigate the influence that DBS may have on cable rates. A time-series analysis would have been difficult because of the lack of readily available data on all variables necessary. Moreover, it is not clear how much would have been gained from such an analysis. Our study looked at the industry in a very early stage of competition between cable and DBS. It will be more useful to include a time-series component in such a model in the future when DBS penetration is greater and the effects of the legislative change allowing DBS firms to provide local broadcast channels can be better estimated. FCC's most recent cable rates study also does not include a time-series component in its econometric model, although it does provide estimates of a single-year model for 2 adjacent years.

4. We believe that the model specification that we used allowed us to disentangle the two possible relationships between DBS penetration and cable rates. FCC staff had questioned the appropriateness of our initial proposed presentation of a single-equation reduced-form cable rate model that included DBS share and the number of cable channels as explanatory variables because these variables could be jointly determined with cable rates (i.e., they are endogenous). Partly in response to FCC's concerns, we based the findings presented in this report on a four-equation structural model—which we had indicated was the basis of the initial single-equation model—in which cable rates, DBS market share, cable subscribers, and cable channels are jointly determined. In addition, we do present a reduced-form pricing equation in the report that we included for the purpose of discussing how those variables that are not determined in the system of equations affect cable rates. The reduced-form cable rates equation includes no endogenous variables—that is, channels, DBS penetration, and cable subscribers are excluded from this equation. Accordingly, we are uncertain what remaining concerns FCC has with "the econometric specification of the model."

# Comments From the National Cable Television Association

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

NCTA
NATIONAL CABLE TELEVISION ASSOCIATION

DANIEL L. BRENNER
SENIOR VICE PRESIDENT FOR LAW & REGULATORY POLICY

June 9, 2000

Ms. Amy Abramowitz
Assistant Director
Resources, Community, and Economic Development Division
U.S. General Accounting Office
411 G Street, N.W., Room 2723
Washington, D.C. 20548

Dear Ms. Abramowitz:

Thank you for the opportunity to review GAO's Draft Report on "The Effect of Competition from Satellite Providers on Cable Rates."

Our primary concern it this: the Draft Report is based on two-year old FCC survey data. Therefore, we believe the draft fails to reflect the explosive growth of DBS subscribership over the last several years, and cable operators' responses to that intense competition.

See comment 1.

We understand that the Draft Report's intent was to provide a baseline from which to compare the effects of competition over the years, and it did not set out to measure competitive effects today. Even assuming the relevance of taking a historical look at DBS competition, we are concerned that the draft does not actually evaluate that effect. To do so would require an examination of cable rates both before and after DBS was introduced into the marketplace. Thus, the draft's inclusion of a snapshot of cable rates and DBS penetration in 1998 (four years after DBS was first launched) may not show much about DBS' effect on any cable system's behavior. This static view may simply show what the rates and program offerings were at that time in a particular community, and not the changes that occurred as DBS competition intensified.

Now on p. 14.

See comment 2.

In addition, the Draft Report fails to highlight recent highly significant data about the dramatic growth of DBS. The draft notes (at page 13) that from June 1998 to June 1999, DBS subscribership grew 39 percent. That trend has increased exponentially, with more than 4 million new customers taking service from DBS since June 1999, another 50 percent rise. DBS subscribership therefore has more than doubled since the 1998 FCC rate survey period. Moreover, DBS for the first time can now offer local-into-local broadcast service as a result of changes passed by Congress in 1999 – a service that it has aggressively rolled out in 30 markets.

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Ms. Amy Abramowitz
June 9, 2000
Page 2

See comment 3.

At the same time, cable rate increases have slowed. The GAO report studied a period where the average monthly rates for operators subject to regulation increased 6.9 percent, according to the FCC. The Federal Communications Commission's Sixth Annual Report on Competition (issued in January 2000) reported that cable prices rose only 3.8 percent between June 1998 and June 1999. As the FCC's Competition Report showed, this was at a time when cable expenditures on system upgrades and programming rose quickly, and DBS competition to cable was escalating.

See comment 4.

Moreover, the Draft Report misses much of the story in focusing exclusively on rates as a measure of competition. Cable operators have responded to competition from DBS in a variety of ways that increase the value of their services to customers. The draft suggests one of those responses – DBS's far greater channel capacity spurred cable operators to increase the number of channels that they provide to consumers. Cable operators have also responded by upgrading system plant to improve reliability and to offer new programming and additional services, such as high-speed Internet access. Operators have also introduced new program packaging options for their customers. And while doing so, cable operators have endeavored to maintain reasonable prices – in line with those of their competitors – even as their costs have increased.

Again, we appreciate the chance to comment on the Draft Report. We'd be happy to further discuss our comments with you.

Sincerely,

Daniel L. Brenner

Daniel L. Brenner

cc: Gregory Klein

DLB:gml

## GAO's Comments

1. We agree that the subscription video market is very dynamic and that an analysis of the contemporary market environment will require up-to-date information and data. The National Cable Television Association (NCTA) suggests that we should have used data from a period prior to the introduction of DBS in 1994 to understand the effect of the introduction of this service on the cable industry. Such an analysis was not feasible because of limited data. However, there was enough variation in the level of DBS penetration across cable franchise areas for us to capture the competitive effects of DBS on cable rates.

2. We understand that DBS has grown dramatically in the last 2 years. We caveat our overall finding with the view that these model results are likely to change as the nature of this market unfolds. We believe that a full understanding of the issues we examine will require more analysis using more recent data. In particular, to understand the effects of the legislative change enabling DBS firms to include local broadcast signals in their DBS programming packages will require using data for some period after that law went into effect.

3. Because this is a cross-sectional model, it is not relevant that cable rates may have been high at that time. This model examines what drives differences in rates across local markets within a given period: It can examine a year when rates are on average high or on average low, and we would expect similar findings.

4. One of our major findings is that the competitive response to greater DBS penetration was largely in the form of nonprice competitive response.

# Comments From the Satellite Broadcasting and Communications Association

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

SATELLITE BROADCASTING AND COMMUNICATIONS ASSOCIATION

**Andrew R. Paul**
**Senior Vice President**

May 30, 2000

Mr. Stanley J. Czerwinski
Associate Director,
Housing, Community, Development and
Telecommunications Issues
U.S. General Accounting Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Czerwinski:

Thank you for the opportunity to review the GAO's draft report entitled, "The Effect of Competition from Satellite Providers on Cable Rates." Understandably this is a complex area does not lend itself to any simple analysis due to the variety of factors that are at play in the scenarios which you evaluated. Nonetheless, we appreciate the diligent efforts you and your staff have made in preparing this report, and we commend you for the depth in which you performed your analyses. It will be an extremely useful document that will complement the studies undertaken by SBCA.

See comment 1.

Our initial question is why it was not possible to include more recent DBS subscriber information in the study. That data is available from our research arm, SkyTRENDS, which is a joint venture between the SBCA and Media Business Corp, a Denver-based economic and statistical research firm. We raise this issue because post-1998 subscriber data can give more meaning to the scenarios which the GAO investigated. For example, 1999 witnessed the acquisition of Primestar Partners and U.S. Satellite Broadcasting by DIRECTV. This action consolidated DBS into two major competitors – DIRECTV and Echostar – and created significant marketing efficiencies within the industry.

See comment 2.

Thus while the DBS industry has been extremely successful since its debut in 1994, it has been in 1999 and 2000 that we have begun to see even more rapid subscriber growth. A major contributor to this development has been, as you discussed in your report, the advent of local-into-local service via satellite that was authorized in the Satellite Home Viewer Improvement Act. Any DBS subscriber – new or existing – is able to receive the major network signals via satellite for a slight incremental fee in those cities where that service is being offered by the DBS providers. The new subscriber results have been extremely encouraging. Our present DBS subscriber count is 12 million, and, at the rate of approximately 350,000 new subscribers per month, we expect a subscriber base of 15 million by the end of the year, and 20 million within 18 months.

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Local-into-local, as your report cited, is an important component of increased competition to cable. However, local signals have not been available to DBS until recently, and unfortunately the period in which they have become available is not included in your study. We would also add that the restrictive must-carry and retransmission consent rules to which DBS is subject will limit the number of markets that DBS will be able to serve with local signals. We believe, therefore, that rate measurements should include those periods since November, 1999, when local signals became available to DBS subscribers, and we suggest that GAO may want to revisit this matter in the not too distant future.

We would also like to address a few specific issues that were contained in the report and deserve additional comment.

1) The GAO report stated that, as a general matter, DBS penetration did not correlate with lower cable rates. In fact, it said that, "our model found that greater DBS penetration was statistically associated with somewhat higher cable rates." One possible explanation that the report mentioned was that cable operators increased the number of channels they offer in response to DBS entry.

We believe that there are other factors at work, too. While increasing the number of channels to be more competitive with satellite's wider range of programming is certainly a factor, cable operators are also expending large sums to be able to provide broadband services to the home over the wire as they believe this will give them a major leg up over DBS in the marketplace. Upgrading their cable facilities to compete with DBS requires large capital outlays, which many cable operators raised through rate increases. Hence, we are not surprised at cable rate increases even in a competitive environment, least of all in urban areas where there are larger cable subscriber bases against which to allocate plant costs.

2. Additionally, the report also noted that, "in places with higher cable rates, subscribers were more likely to migrate to DBS." That should not be surprising either in view of cable rate hikes. The migration to DBS, however, is taking place even though the average DBS subscriber chooses to spend over $50 per month in subscription fees while cable subscribers spend an average of $40. They are doing so because they are receiving more value for their money because of the greater choice and higher quality that DBS offers. In that regard, both the Yankee Group study and the J.D. Power surveys give DBS the highest satisfaction ratings among multichannel video program distributors (MVPD) by a significant margin. The Yankee Group study showed that consumers gave DBS the highest rating among all telecommunications services and utilities. This data is included in the enclosed SBCA annual filing with the FCC on the state of competition in the video marketplace (1999).

2

Therefore, simply comparing rates is not a sufficient measure to determine whether or not competition is either present or effective. Any measurement should include not just rates, but the value the subscriber is receiving, *i.e*, across-the-board customer satisfaction.

See comment 3.

3. Little known in this equation is the fact that DBS is forced to pay copyright fees that are significantly higher than what cable pays for the same distant broadcast programming. While the rates for these signals are set by the terms of the compulsory license to which each MVPD is respectively subject, the cable copyright fees are set in the law while the analogous DBS fees have been determined by an arbitration panel that is directed to formulate them in accordance with a convoluted version of "fair market value."

As a result, DBS pays copyright fees of 18.9 cents per subscriber per month for superstation signals, and 14.5 cents for distant network signals. Cable pays approximately on average 9.8 cents and 2.8 cents respectively for the same signals. This is a significant disparity.

We appreciate the opportunity to comments on the study. We suggest that you review the enclosed filing and the accompanying material, and if you would like to discuss any of these matters with us further, we would be pleased to meet with your staff.

Sincerely yours,

Andrew R. Paul

Cc: A. Abramowitz
S. Brown
F. Morrison
J. Karikari

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## GAO's Comments

1. Although 1999 DBS data were available, we could not do the analysis for 1999 because the cable data, which constitute a major, important part of the database for our study, were not available at the time we began this analysis. Thus, we had to use 1998 as the year of observation for this model.

2. We understand that DBS has grown dramatically in the last 2 years. We caveat our overall finding with the view that these model results are likely to change as the nature of this market unfolds. We believe that a full understanding of the issues we examine will require more analysis using more recent data. In particular, to understand the effects of the legislative change enabling DBS firms to include local broadcast signals in their DBS programming packages will require using data for some period after that law went into effect.

3. Copyright fees do not vary across localities and therefore cannot be included in this model. However, we note in our discussion of the model's development that cable and satellite providers are differentiated in many ways, including their cost structures. Thus, these underlying cost differentials play an important role in this kind of model.

# GAO Contacts and Staff Acknowledgments

## GAO Contacts

Stanley J. Czerwinski, (202) 512-7631

Amy D. Abramowitz, (202) 512-4936

## Acknowledgments

In addition to those named above, Stephen M. Brown, Jay Cherlow, Venkareddy Chennareddy, John A. Karikari, and Faye Morrison made key contributions to this report.

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