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Publication Date

2007-09-01

Sky Wars: The Attempted Merger of EchoStar and DirecTV (2000)

Richard Gilbert and James Ratliff*

Introduction

On October 28, 2001, EchoStar Communications Corporation announced its intention to acquire the assets of Hughes Electronics Corporation. At the time of the proposed merger EchoStar operated the Dish Network and DirecTV was operated by Hughes, which was then a wholly owned subsidiary of General Motors. EchoStar and DirecTV were the only direct broadcast satellite (DBS) companies that provided multi-channel video programming distribution (MVPD) services to the entire continental United States.

Satellite television service in the United States dates from the late 1970s. The first satellite television services operated at relatively low power in the C-band of the electromagnetic spectrum at roughly 4 GHz and required a receiving antenna roughly four to eight feet in diameter. DBS service generally refers to higher power transmissions in the Ku-band at about 12.2 to 12.7 GHz. The higher power and shorter wavelength of these transmissions (wavelength is inversely related to frequency) made possible the use of much smaller receiving antennae than those used in C-band systems.

DBS service in North America began with PrimeStar, a joint venture of several of the nation's largest cable companies. PrimeStar launched analog service in 1991 and transitioned to digital broadcasts in 1994. PrimeStar was a medium-power technology and required a receiving dish about three feet in diameter. DirecTV launched its higher-power all-digital DBS service in June 1994. DirecTV's service required a receiving dish the size of a large pizza, smaller than PrimeStar's dish and far smaller than the trailer-sized dish required for C-band reception. PrimeStar was not competitive with the DirecTV service, which offered more programming with a smaller dish antenna. DirecTV purchased PrimeStar in 1999 and migrated all PrimeStar subscribers to DirecTV

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equipment. EchoStar's Dish Network launched its DBS service in the United States in March 1996, two years after DirecTV. The receiving dish formats are similar for EchoStar and DirecTV, although the two systems are not compatible because they use different signal encryption methods.

Sales of DBS systems mushroomed and rapidly displaced sales of C-band systems. DirecTV and EchoStar each had more than two million subscribers within two years from their launch dates. DirecTV, with its two-year head start and acquisition of the PrimeStar installed base, was the larger of the two, but EchoStar closed the gap with a combination of aggressive pricing and promotion. By 2002, DirecTV had grown to more than 10.9 million subscribers, and EchoStar had more than 7.5 million subscribers (DOJ 2002a).

DBS networks broadcast from satellites placed in geosynchronous orbits, so that they appear in a fixed position in the sky when viewed from the earth. International Telecommunications Union rules determine the number and location of these orbits to avoid interference between transmissions. There are three orbital locations that provide DBS coverage over the entire continental United States excluding Alaska (called full-CONUS slots) located at 101, 110, and 119 degrees west longitude (W.L.). The FCC governs assignment of the orbital positions and available transponder frequencies to DBS carriers.¹ Thirty-two transponder frequencies are available at each orbital slot, totaling 96 full-CONUS frequencies. Each frequency can carry multiple channels (e.g., ESPN and HBO).

Several companies controlled the 96 available full-CONUS frequencies in the early years of the DBS industry, but by mid-1999 DirecTV and EchoStar had acquired rights to all 96 frequencies, with EchoStar controlling 50 and DirecTV controlling the remaining 46. Although high-power DBS service can also be offered from non-full-CONUS slots, these slots are less desirable for a mass-market DBS service because they do not cover the entire continental United States. At the time of the proposed merger, EchoStar had

¹ A transponder receives the uplink signal from a ground station and re-broadcasts the signal to the ground.

capacity for 500 channels and DirecTV had capacity for 460 channels in standard definition under the assumption of 10 channels per transponder.

Both the Antitrust Division of the Department of Justice (DOJ) and the Federal Communications Commission (FCC) reviewed the proposed merger of EchoStar and DirecTV. The FCC was involved because the merger would have required the transfer of various broadcast licenses and authorizations for which the FCC has authority. One year after EchoStar and DirecTV announced their intent to merge, the DOJ, joined by the attorneys general of 23 states, the District of Columbia, and the Commonwealth of Puerto Rico, filed a civil antitrust lawsuit to block the proposed acquisition. The DOJ said that if the merger were allowed to proceed, it would eliminate competition between the nation's two most significant DBS services and substantially reduce competition in the MVPD business to the detriment of consumers throughout the United States.² A few days earlier the FCC had announced its objection to the proposed merger and ordered the matter set for an administrative hearing. EchoStar and DirecTV abandoned their proposed merger in response to the challenge by the DOJ and concerns indicated by the FCC.

While mergers typically challenge antitrust enforcers to balance possible efficiency benefits against the risk of higher prices, the proposed merger of EchoStar and DirecTV was extraordinary in both respects. As the only two DBS suppliers in the U.S., the combination of EchoStar and DirecTV was a potential merger to monopoly for consumers without access to cable television. For most other consumers, the merger would lower the number of suppliers of multi-channel video programming distribution services from three to two, although the merging parties argued that competition from cable would be sufficient to discipline pricing by the merged satellite supplier. The proposed merger also had the potential to create significant efficiencies. There was a large overlap in the programming supplied by EchoStar and DirecTV, and both companies faced capacity constraints. A merger of the two DBS suppliers could

² U.S. Department of Justice Press Release, Justice Department Files Suit to Block EchoStar's Acquisition of Hughes Electronics, October 31, 2002.
<http://www.usdoj.gov/atr/public/press_releases/2002/200412.htm>

eliminate much of this duplication and free up capacity for other services. The dilemma was whether the merger-specific efficiencies outweighed the possible harm from higher prices.

The analysis by the DOJ and the FCC followed the methodology described in their jointly issued Horizontal Merger Guidelines (DOJ & FTC 1997). We first discuss product and geographic market definition. Next we turn to competitive effects, which, along with efficiencies, was a central issue for analysis of the proposed merger. We also discuss the potential for entry and claimed efficiencies, and we close with a retrospective look at the performance of EchoStar and DirecTV since their proposed merger was abandoned.

Product Market Definition

EchoStar and DirecTV are in the business of multichannel video programming distribution (MVPD). According to the FCC, MVPD suppliers are entities that offer multiple channels of video programming for purchase by subscribers or customers.³ The services that the FCC considers to be within MVPD include cable, direct broadcast satellite (DBS), multichannel multipoint distribution service (MMDS), satellite master antenna television (SMATV), and C-band.⁴

MVPD subscribers represented 86.4 percent of all TV households in 2001 (FCC 2002b, Table C-1). Table 1 shows each service's share of MVPD subscribers in 2001. MMDS, SMATV, and C-band together accounted for less than four percent of all MVPD services in 2001, and their share was not increasing. The DBS share has grown substantially and accounted for 75 percent of the growth in MVPD households from 1997-2001. Cable systems can be digital or analog. Digital cable offers higher quality, more channels, and other content such as greater choice of pay-per-view movies. DirecTV and EchoStar are

³ 47 C.F.R. § 76.1000(e).

⁴ MMDS is a broadband wireless technology. SMATV is generally intended for distribution of TV signals to households in one or more adjacent buildings. Other technologies, such as DSL, were not available at the time of the proposed merger to provide MVPD services, and were not widely deployed several years later.

all-digital services.

Table 1. National MVPD subscriber shares (June 2001)

	Percent of MVPD subscribers
Cable	78.0
DBS	18.3
SMATV	1.7
C-band	1.1
MMDS	0.8

Source: FCC Tenth Annual Report (2004), Table B-1.

Product market definition was not a particularly contentious issue in this proposed merger. While the parties and the antitrust enforcement agencies at times disputed the precise boundaries of the relevant product market, these disagreements had little impact on the general conclusion that a merger of EchoStar and DirecTV would substantially increase concentration in markets that were already highly concentrated.

The merging parties asserted that the relevant product market included all MVPD services and may be even broader (Willig 2001, p. 4), although the parties' competitive analysis focused on DBS and cable. The DOJ complaint alleged that the relevant product market affected by the proposed merger was multichannel video programming distribution, but rejected C-band service as an acceptable substitute due to the high cost and inconvenience of the necessary equipment (DOJ 2002a). Given the small share of MVPD services other than cable and DBS, whether these other MVPD services were included in the relevant market had little quantitative significance for the effects of the proposed merger on estimated market shares. The DOJ also noted that digital cable systems are closer substitutes for DBS than older analog cable systems.

The FCC adopted a MVPD product market for the purpose of its Hearing Designation Order. However, the FCC also found evidence to support a narrower market definition. The FCC noted that: MVPD services are highly differentiated; the evidence strongly suggests that EchoStar and DirecTV are closer substitutes for each other than for services

of cable systems or other MVPDs; and high-capacity digital cable systems appear to be a closer substitute for DBS than are low-capacity analog cable systems (FCC 2002a, pp. 49–51).

Most consumers do not consider over-the-air broadcast television an acceptable substitute for cable or DBS services, particularly the many consumers who live in areas with poor over-the-air reception. Over-the-air broadcast television does not include the variety of programming that is available to cable and DBS subscribers. It does not provide the number of channels or access to popular channels such as ESPN or CNN and premium services such as HBO or Showtime. Despite the fact that over-the-air programming is available for free, most consumers willingly pay hundreds of dollars per year to subscribe to cable or DBS service. As was noted above, as of June 2001, more than 86 percent of all U.S. TV households subscribed to a fee-based MVPD service. Furthermore, cable prices have been increasing over time, while over-the-air broadcasts have remained free, which suggests that competition from over-the-air broadcasts is not sufficient to discipline cable prices. Applying a Merger Guidelines test, it is highly unlikely that a small but significant price increase by a hypothetical cable/DBS monopolist would be made unprofitable by customers switching to over-the-air television, which is reason to conclude that broadcast television is not in the same relevant market as cable and DBS.

A credible case could be made that DBS and digital cable are sufficiently distinct from analog cable to be in a separate relevant product market. Both DBS and digital cable have higher quality video and audio compared to analog cable and over-the-air broadcasts and offer more programming content. DBS, as an all-digital service, is more closely comparable to digital cable than to analog cable. Digital cable commands a premium price relative to analog cable. At about the time of the proposed merger, most cable systems required that consumers subscribe to a digital tier on top of their regular analog service in order to receive digital broadcasts. In July 2001, the average monthly price of the most highly subscribed digital tier for cable systems was \$9.62, compared to \$33.81 for the most highly subscribed expanded tier that included only analog channels. This implies an average monthly price for digital cable service equal to \$43.43, which is a

premium for digital service of about 28 percent.⁵ The significant price gap between the price of analog and digital cable service indicated that there was considerable differentiation between the two services. Separate market-share calculations were performed corresponding to a product market comprised of DBS and all cable systems and a market comprised of DBS and only digital cable systems.

Cable and DBS services are not uniformly available to all consumers. Estimates of the fraction of households passed by cable in 2001 ranged from about 81 to 97 percent,⁶ but many homes that were passed by cable did not have access to digital cable. According to the FCC, about 76 percent of all cable subscribers had access to digital cable in 2001 and 88 percent in 2002 (FCC 2003b, Table 10). DBS is not an option for some consumers. DBS requires an unobstructed line of sight between the satellite and the customer's dish. Some consumers either do not have an unobstructed path to the satellite or do not want to place a dish in a location with an unobstructed path, and others live in dwelling units that do not allow the placement of DBS equipment.

Geographic Markets

The merging parties initially contended that the relevant geographic market is national in scope, because both EchoStar and DirecTV have national pricing plans (Willig 2001, p. 11), although the parties' competitive analysis subsequently accounted for local differences in competition. While the DBS companies provide nationwide services, cable is provided locally. Even if EchoStar and DirecTV programming services were priced uniformly for all customers in the continental U.S., the effects of a merger of the two nationwide DBS suppliers would depend on cable prices and service offerings at the local level. Furthermore, both EchoStar and DirecTV have targeted promotions at local levels and have the ability to price at a local level if they choose to do so. Structural analysis of the merger was performed at the level of the cable franchise area for regions that have cable service and at the Designated Market Area (DMA) level for regions without cable

⁵ FCC (2003b). These prices exclude equipment costs, which were somewhat higher for digital service.

⁶ FCC (2002b), pp.11–12. The range reflects differences in the definition of households.

service.⁷

Nearly all of the MVPD markets were highly concentrated, and the Herfindahl-Hirschman Indices (HHIs) for the proposed merger exceeded the structural screen in the DOJ/FTC Horizontal Merger Guidelines for identifying mergers that potentially raise significant competitive concerns. FCC staff computed concentration indices for geographic markets corresponding to 4,984 local cable systems. The median post-merger HHI was 5,653 and the median increase in the HHI was 861 for local MVPD markets consisting of DBS and all cable systems, whether analog or digital. When the product market was limited to DBS and high-capacity (digital) cable systems, the median post-merger HHI was 6,693 and the median increase in the HHI was 206. (FCC 2002a, p. 57) These figures likely understate the significance of the proposed EchoStar-DirecTV merger for the structure of MVPD markets because DBS was experiencing rapid growth in the time period leading up to the proposed merger. Additional growth would increase the shares of EchoStar and DirecTV and increase the change in concentration from the merger.

The market definition analysis suggests concern that a merged EchoStar and DirecTV would have sufficient market power to raise prices above pre-merger levels. This concern is apparent whether the relevant product market includes all cable systems or is limited to the subset of digital cable systems. In regions—primarily rural areas—that do not have access to cable, the merger of EchoStar and DirecTV would change the structure of the market from two MVPD competitors to a single monopoly provider of MVPD services.⁸ As noted above, the estimated percentage of households without access to cable ranged from 3 percent to 19 percent in 2001, depending on the source of the data. An even higher percentage of DBS subscribers are in regions that do not have cable access. Thus, for a large number of DBS households the merger of EchoStar and

⁷ A Designated Market Area is a geographic area defined by Nielsen Media Research as a group of counties that make up a particular television market.

⁸ This ignores the very small population receiving C-band and MVPD services other than cable and DBS in rural areas.

DirecTV would be a merger to monopoly. Many other households do not have access to digital cable, and the merger of EchoStar and DirecTV would create a monopoly supplier of digital MVPD services for these households.⁹

Competitive Effects

While market shares identify structural conditions that *could* allow the merged firm—“New EchoStar”—to exercise market power, they do not demonstrate that the merged firm *would* raise prices or increase quality-adjusted prices by reducing programming offerings or other dimensions of service quality.

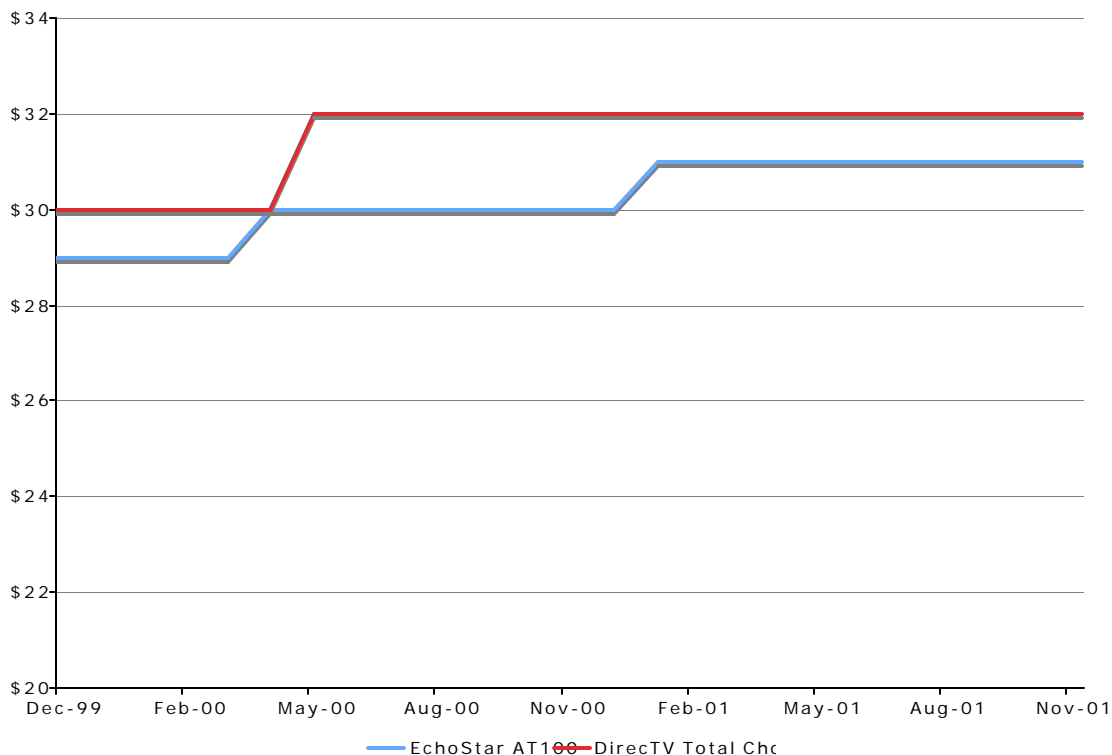
For households with cable access, it is possible that New EchoStar’s incentives to compete with cable would be sufficient to restrain post-merger prices. Furthermore, if New EchoStar continued to price DBS service on a national basis, then competition from cable where cable is a competitor might provide sufficient discipline to prevent price increases for households that are without cable access.

Proponents of the merger argued that the merger would not adversely affect price or service quality because EchoStar and DirecTV compete to attract customers from cable more than from each other.¹⁰ There is, however, evidence of direct competition between EchoStar and DirecTV. Historically, EchoStar and DirecTV have offered similar prices and services. Figure 1 shows the monthly price of popular programming packages offered by EchoStar and DirecTV. EchoStar charged a lower price over this period, although the difference never exceeded \$2 per month.

⁹ The effect would not be a merger to monopoly for all of these households, because some might not be able to receive DBS signals, and some might not have had access to both EchoStar and DirecTV before the merger.

¹⁰ See, e.g., Willig (2001).

Figure 1. Monthly prices for DirecTV and EchoStar most-popular programming packages.



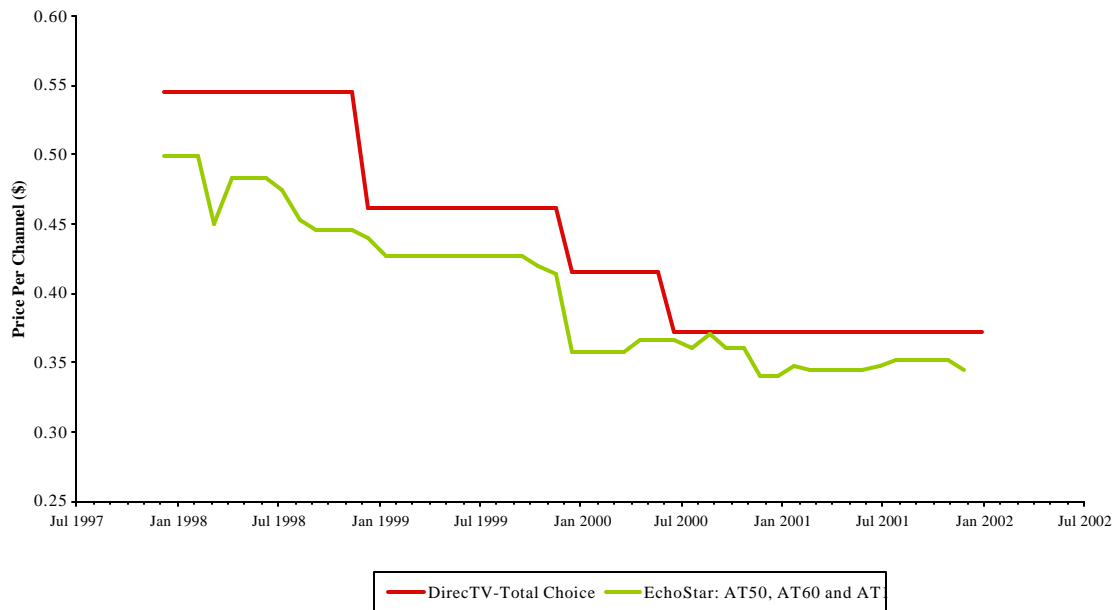
Source: Archived copies of directv.com and dishnetwork.com accessed in 2002.

Expanding the number and diversity of channels is another way to lower the effective price. Figure 2 shows the price per channel for EchoStar and DirecTV for their most-popular programming packages.¹¹ The price per channel decreased from \$0.55 in early 1998 to about \$0.35 to \$0.38 by the beginning of 2000 and remained at that level for the next two years.¹²

¹¹ Total Choice was DirecTV's most popular package during this period. AT50, AT60, and AT100 were EchoStar's most-popular packages at different times during this period. At every point in time, the graph reflects the price per channel of the EchoStar package that was most popular at that time.

¹² These figures exclude installation and equipment fees.

Figure 2: Monthly per-channel prices for DirecTV's and EchoStar's most-popular programming packages



Source: Archived copies of directv.com and dishnetwork.com accessed in 2002.

Competition between EchoStar and DirecTV appears to have been particularly intense for customer premises equipment and installation prices, which dropped from several hundred dollars to near zero.¹³ The DOJ complaint noted that EchoStar itself acknowledged in papers filed in U.S. District Court in 2000 (in an antitrust suit that EchoStar had brought against DirecTV, that was eventually dropped) that DirecTV and EchoStar reacted primarily to each other when setting equipment and service prices. The DOJ complaint also offered evidence from EchoStar CEO Charles Ergen regarding the importance of head-to-head competition with DirecTV. In an e-mail concerning Alaska, where DirecTV does not have a strong signal, Ergen wrote: “[r]ealize we have signal in Alaska and D[irec]TV doesn’t have much, we don’t have competition there. We don’t need to be as aggressive.”

¹³ MacAvoy (2002, pp. 34–35) describes several instances of competitive responses by each DBS provider to price and quality offerings by the other company.

Another indication of competition between EchoStar and DirecTV was the total price of subscribing to these services, which appeared to be slightly lower than the price of cable after adjusting for digital versus analog service. Comparison of DBS and cable prices is complicated by the specific composition of programming packages, differences in equipment and installation costs, and the cost and availability of other services. In July 2001, the average monthly rate for cable was \$33.81, excluding equipment costs (FCC 2003b, Table 1). This bought an average of about 59 analog channels, including local broadcast networks. Digital cable service, when it was available, required an additional fee. In 2002, EchoStar offered about 60 all-digital channels for a monthly fee of \$31.99. Further complicating the comparison is that local channels for EchoStar cost an additional \$5.99 per month and equipment costs could differ for multiple television sets. As previously noted, DirecTV prices were close to the prices charged by EchoStar.

Even if DBS prices were unambiguously lower than cable prices, this does not allow a definitive conclusion that competition between EchoStar and DirecTV is more important than competition between DBS and cable, because lower DBS prices could be driven by competition between DBS and cable for MVPD customers. Certainly, a large fraction of the potential customers for DBS were people who were actual or potential cable subscribers. Whether New EchoStar would have continued to have an incentive to price low to win market share from cable requires a more thorough analysis of the demand for DBS and cable services.

Coordinated and Unilateral Effects

A merger can result in higher prices by facilitating coordinated interactions in the markets affected by the merger or by increasing the ability of the merged firm to profit through unilateral increases in price. Coordinated effects arise when firms in the industry recognize their mutual interdependence and take actions that sustain their joint profits. The DOJ complaint alleged that the merger presented a risk of coordinated effects, because the merged company could target discounts and promotions to regions of the country in which the local cable company departed from a collusive pricing scheme.

Unilateral effects arise when the merged firm has sufficient market power to raise prices above pre-merger levels with no accommodating price response from other firms in the relevant markets. While the competitive analysis of the proposed EchoStar-DirecTV merger recognized the risk of coordinated effects, much of the analysis by the parties, the DOJ, and the FCC focused on the likely unilateral effects from the merger.

The ability to increase prices unilaterally depends on the elasticity of demand for the products sold by the merged firm and the extent to which the products of the merging firms are differentiated from each other. Under the assumption that the merged firm maximizes profit, the elasticity of demand for DBS and the marginal cost of supplying DBS services determine the post-merger price of DBS through the necessary condition for profit-maximization:

$$\frac{P_j - MC_j}{P_j} = -\frac{1}{e_{jj}}. \quad (1)$$

In equation (1), P_j is the price of product j , MC_j is its marginal production cost, and e_{jj} is its own-elasticity of demand. The left-hand-side of (1) is the Lerner Index of market power.

Analysis of the demand for DBS is complicated by the fact that there is little variation in the price of DBS systems. EchoStar and DirecTV charge a single national price for each service package, and that price has moved little over time. There is some variation in effective prices from changes in programming and from price promotions, but the changes in programming were also nationwide, and it is difficult to obtain accurate and comprehensive data on price promotions.

Goolsbee and Petrin (2004) measured DBS price elasticity by exploiting symmetry conditions in demand. Specifically, if a household's share of expenditures on all MVPD program is independent of prices, then the effect on household demand of a one dollar increase in the price of DBS is equivalent to the effect of a one dollar decrease in the

prices of all substitute MVPD services. Using this relation, they estimated the demand elasticities in Table 2.¹⁴ The services in the Goolsbee and Petrin (2004) demand analysis are over-the-air broadcasts (antenna), expanded basic cable, premium cable, and DBS. Expanded basic cable is an analog service with about 60 channels including local networks. Premium cable service includes one or more premium networks such as HBO. The analysis aggregates demand for the two DBS providers, EchoStar and DirecTV.

Table 2. Estimated price elasticities (Goolsbee and Petrin, 2004)

Service	Price		
	Expanded Basic	Premium Cable	DBS
Antenna	1.30	.92	.12
Expanded Basic	-1.54	.92	.29
Premium Cable	1.26	-3.18	.49
DBS	.93	1.17	-2.45

The elasticities in Table 2 have the expected signs. Own-elasticities are negative, and cross-elasticities are all positive, implying that the different types of services are substitutes, although only weakly so for DBS and over-the-air broadcasts.

The estimated elasticity of demand for DBS implies that a merged DBS company would have the ability to raise price significantly above marginal cost. Using equation (1) and assuming the own-elasticity $e_{jj} = -2.45$ for DBS service estimated by Goolsbee and Petrin (2004), a merged DBS company would maximize its profit by choosing a Lerner Index of about 40 percent. This corresponds to setting price about 70 percent above marginal cost.

The demand analysis showed that the profit-maximizing price for New EchoStar would be significantly above its marginal cost, but the analysis did not establish that the merger

¹⁴ The estimated price elasticities for DBS in Table 2 are lower in magnitude than the estimates in a previous working paper by the same authors that was available at the time of the merger (Goolsbee and Petrin, 2001). Independent analysis performed by the authors of this chapter and others using confidential data resulted in estimated price elasticities for DBS that were closer to those in Table 2.

would lessen competition and result in higher prices, adjusted for the quality of service, relative to pre-merger prices. Given an accurate estimate of marginal cost, the DBS elasticity is sufficient to forecast the post-merger profit-maximizing price, which can be compared to pre-merger prices to estimate the likely price increase from the merger. However, marginal cost is difficult to measure, in part because some cost components vary only for some customers. For example, installation and equipment costs are sunk for existing customers, but they are marginal costs for the acquisition of new customers.

Using accounting data on programming expenses and customer acquisition costs, MacAvoy (2002, p. 41) estimates monthly marginal costs of \$26.80 for DirecTV and \$30.39 for EchoStar. From equation (1), the -2.45 own-elasticity of demand for DBS in Table 2 implies a post-merger price of \$44.20, using the lower marginal cost estimate for DirecTV, or \$50.12, using the higher marginal cost estimate for EchoStar. Both estimates are significantly higher than the pre-merger prices for EchoStar and DirecTV. These prices were roughly \$30.99 per month for EchoStar and \$31.99 per month for DirecTV, plus \$5.99 per month for local channels, excluding fees for premium services. Equipment and installation were typically free, although customers could be charged extra for special installation requirements or additional set-top boxes.

An alternative approach employed in modern unilateral effects analysis is to estimate the matrix of own and cross-elasticities of demand for products in the relevant markets and use these estimates, along with assumed competitive behavior, to estimate marginal production costs.¹⁵ This approach generates estimates of the pre-merger Lerner Indices for EchoStar and DirecTV. Given actual prices, the pre-merger Lerner Indices can be used to estimate marginal production costs. The estimated marginal costs then permit estimates of likely post-merger prices using equation (1).

In theory, the matrix of own and cross-price elasticities can be estimated using a refinement of the econometric approach followed by Goolsbee and Petrin (2004) in

¹⁵ See, e.g., Nevo (2000) and Berry (1994).

which consumers first choose between DBS and other MVPD services, and then choose between EchoStar and DirecTV. In this “nested” choice model, the nest parameter measures the similarity of consumer tastes for the two DBS services and therefore the competition that would be lost if EchoStar and DirecTV were to merge. Unfortunately, experiments with this approach were inconclusive. With very little variation in the prices charged by EchoStar and DirecTV, it was difficult to obtain robust estimation results for the nest parameter.¹⁶ Instead, we consider other, more heuristic approaches to estimate the loss of competition from the merger.

Two approaches are useful to estimate whether the merger would likely result in higher prices. These are: (i) a Nash-Cournot model of competition and (ii) a dynamic model that estimates a bound on consumer willingness-to-pay for DBS and thus indirectly measures incentives of New EchoStar to increase price. These are both in the category of a unilateral effects analysis because they explore the incentives of the merged firm to raise price under the assumption of no price response from cable suppliers.

Nash-Cournot Competition

On the assumption that EchoStar and DirecTV behave as Nash-Cournot competitors,¹⁷ the pre-merger prices for each network would satisfy the following condition:

$$\frac{P_j - MC_j}{P_j} = -\frac{s_j}{\mathbf{h}}, \quad (2)$$

where s_j is firm j 's share of DBS programming and \mathbf{h} is the elasticity of demand for DBS expressed as a negative number.¹⁸ The right-hand side of equation (2) is the reciprocal of

¹⁶ Rozanski and Thompson (2005) discuss econometric issues addressed by the Antitrust Division in their investigation of the proposed merger.

¹⁷ A Nash-Cournot competitor maximizes its profit by choosing its output level under the assumption that the outputs of other firms are fixed. This is not an accurate characterization of competitive conduct in an industry such as DBS, where suppliers set prices and capacity constraints often are not binding. It is useful, however, as a baseline for pre-merger conduct that is neither especially intense nor collusive.

¹⁸ The relevant share in equation (2) is the share of DBS, not the share of all MVPD services, because the market elasticity in equation (2) is the elasticity of demand for DBS.

the firm-specific elasticity of demand for product j . For example, if EchoStar has 40 percent of DBS subscribers and DirecTV has the remainder, and the elasticity of demand for DBS is -2.54 , then the firm-specific elasticity of demand for EchoStar would be about -6.4 and the firm-specific elasticity of demand for DirecTV would be about -4.2 .¹⁹ These different firm-specific elasticities imply different prices, unless the networks' marginal costs differ as well, which is plausible. The observed prices of \$30.99 per month for EchoStar and \$31.99 per month for DirecTV, plus \$5.99 per month for local channels, are consistent with the Lerner Indices implied by equation (2) if DirecTV's marginal cost is \$28.94 and EchoStar's marginal cost is \$31.20. These estimated marginal costs are close to the levels estimated independently by MacAvoy (2002).

Under the assumption that the proposed merger would not generate efficiencies or create additional costs, a conservative assumption is that New EchoStar's marginal production cost would equal the lower of the two estimated marginal costs from the Nash-Cournot model. This is \$28.94 for DirecTV. Using this marginal cost and the DBS elasticity of -2.54 gives a post-merger price of \$47.73 per month for DBS service; i.e., from equation

$$(1), P = \frac{MC}{1 + \frac{1}{h}}, \text{ which implies } \$47.73 = \frac{\$28.94}{1 - \frac{1}{2.54}}.$$

The average of the pre-merger prices for EchoStar and DirecTV is about \$37.48 per month. This is the simple average of the monthly prices for EchoStar and DirecTV, plus \$5.99 per month for local channels.

Under the Nash-Cournot assumption for pre-merger competition, the merger would cause a price increase of about 27 percent above pre-merger levels.

The predicted price increase from the merger depends on estimated price elasticities, the intensity of competition before the merger, and estimated marginal costs before and after the merger. The intensity of pre-merger competition affects the predicted price increase from the merger because the pre-merger price-cost margin is the basis for estimating the marginal cost of satellite TV, which in turn is an input for estimating the post-merger

¹⁹ A more general model could incorporate perceived competitive responses from other firms. See, e.g., Baker and Bresnahan (1988).

price. The estimated price increase from the merger would be larger than predicted with the Nash-Cournot model if pre-merger competition between EchoStar and DirecTV were more intense than implied by the Nash-Cournot assumption and lower if competition were less intense. In the former case, the estimated marginal cost would be closer to the pre-merger price, and equation (1) would then imply a higher price increase from the merger. If, hypothetically, EchoStar and DirecTV were avoiding price competition pre-merger, then the estimated marginal cost would be lower, and the price increase from the merger would be smaller or even non-existent.

The parties argued that the merger would not raise prices in part because they claimed that consumers did not view EchoStar and DirecTV to be close substitutes and therefore the merger would not have eliminated significant price competition. According to the parties, competition was primarily between DBS and cable, not between EchoStar and DirecTV. The parties justified this conclusion using “churn data,” which estimated the fraction of subscribers leaving a particular DBS provider who went to each of the other DBS provider, cable, or over-the-air TV. The data showed that consumers switched between DBS and cable more than they switched between EchoStar and DirecTV.

Churn data, however, are difficult to interpret because consumer switching behavior is indicative of price elasticity only if the switching occurs as a direct result of a change in relative prices. Consumers switch MVPD providers for many different reasons, and significant changes in the relative prices of EchoStar and DirecTV have been rare. For example, if a consumer stops subscribing to EchoStar for a reason other than an increase in the price of EchoStar relative to the price of DirecTV, it is unlikely that the consumer would switch to DirecTV if the consumer considers the two DBS suppliers to be close substitutes and their relative prices have not changed. Thus, churn data that show more switching between DBS and cable than switching between EchoStar and DirecTV is consistent with aggressive competition between EchoStar and DirecTV if the switching is for reasons other than changes in the relative prices of the two DBS suppliers.

The parties also argued that the merger would not raise quality-adjusted prices because

New EchoStar would have lower marginal production costs and supply improved products. Applying equation (1), the post-merger price is proportional to the post-merger marginal cost. If the post-merger marginal cost is smaller than the pre-merger marginal cost, the post-merger price might be no higher than the prices that existed before the merger. Furthermore, new and improved products offered by the merged firm would benefit consumers, although in ways that are not directly captured by equation (1). We address the parties' efficiency claims below and demonstrate that the merger was not necessary for EchoStar and DirecTV to achieve many of the claimed efficiencies.

Dynamics of consumer adoption of satellite TV

The history of customer adoption of satellite TV provides additional evidence for concern about a price increase from the merger. The price of DBS relative to cable has fallen since EchoStar first offered DBS service in 1996, largely because EchoStar and DirecTV have slashed the cost to consumers for equipment and installations. Early adopters of satellite TV revealed a higher willingness to pay for DBS relative to cable than did later adopters. Competition between EchoStar and DirecTV generated consumer surplus for these early adopters, as the quality-adjusted price of satellite TV net of equipment and installation costs fell relative to cable. Over time, the merged company would have an increasing incentive to capture the willingness to pay of these consumers in its installed base.²⁰

Figure 3 shows three measures of the price of DBS relative to cable programming over the period February 1998 through December 2001. The monthly charge measure compares (a) the monthly price of EchoStar's AT100 package, plus an installation charge amortized over two years,²¹ with (b) the average monthly charge for cable service,

²⁰ This analysis is related to observationally based price discrimination described in Fudenberg and Tirole (1998), where a consumer's past purchase behavior reveals information about her willingness to pay.

²¹ As was explained earlier, the prices of EchoStar and DirecTV were very similar over this period.

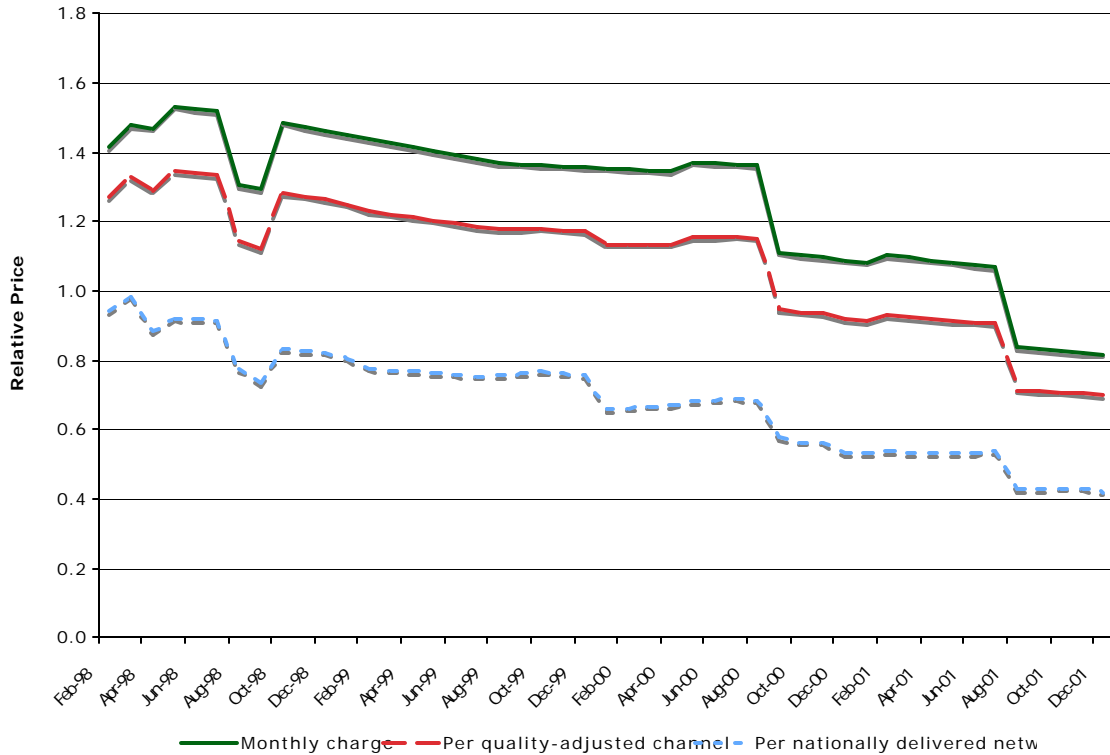
including equipment costs.²² The “per nationally delivered network” measure divides the monthly charges by the number of national networks provided.²³ The price per quality-adjusted channel acknowledges that an incremental channel in programming packages with larger numbers of channels may not be worth as much to consumers as an incremental channel in a smaller package. This measure divides the monthly charge by a concave function of the number of national networks provided.²⁴ All three relative prices declined between 40 to 55 percent over this period. This suggests that New EchoStar could raise prices by a significant amount before early adopters of DBS would switch to cable.

²² These monthly cable-service prices are interpolated from annual averages of the monthly charges for the basic service tier (BST) and the major cable programming service tier (CPST), plus equipment, compiled from the FCC’s series of reports on cable industry prices at <<http://www.fcc.gov/mb/csrptpg.html>>.

²³ These are the channels traditionally thought of as “cable channels” as distinct from local programming. See, e.g., note 11 in FCC (2003b).

²⁴ Nielsen ratings were used to rank networks in descending order. Each network was given a normalized rating relative to the rating of the top-rated network. The cumulative normalized rating as a function of number of channels was estimated to be $0.347 + 2.218 \ln(n)$, where n is the number of channels in a programming package.

Figure 3: Three measures of the relative price of DBS vs. cable over time.



Source: Archived copies of dishnetwork.com accessed in 2002; FCC’s series of annual Reports on Cable Industry Prices.

Two factors have contributed to maintaining relatively low DBS prices: competition between EchoStar and DirecTV and competition between DBS and cable. Although the merger would eliminate competition between EchoStar and DirecTV, New EchoStar still would have an incentive to attract new customers from cable and keep existing customers from switching to cable. New DBS customers are likely to be more price-elastic than are old customers, in part because old customers have revealed a high willingness to pay for DBS by subscribing when the price of DBS was high relative to cable. Under the assumption that New EchoStar cannot charge significantly different prices for new and old customers, New EchoStar would have an incentive to set a low uniform price to build its subscriber base. However, as the installed base of DBS subscribers increases over time, the merged company’s incentives would tilt toward raising prices to exploit the

installed base of DBS legacy subscribers.²⁵

The authors developed a simulation model that integrated estimates of elasticities for legacy subscribers, price-dependent growth rates for new subscribers, subscriber churn, and switching costs to explore New EchoStar's incentives for a post-merger price increase. Over a wide range of plausible parameters the model predicted post-merger price increases for DBS service of more than 15%.

In this analysis, the time path of prices reveals that customers who purchased DBS services in the past had a high willingness-to-pay for DBS. New EchoStar could profitably exploit these customers' high willingness-to-pay when the installed base of customers is large relative to the flow arrival rate of new customers. Switching costs are a further reason why New EchoStar could profitably raise prices when its installed base of customers is large relative to the flow arrival rate of new customers. Switching costs arise from sunk expenditures by consumers on installation and equipment, long-term purchase contracts, and the time and inconvenience of researching MVPD alternatives and having one installed.²⁶

National pricing

Proponents of the merger argued that a commitment to national pricing would protect consumers and is credible, because both companies had always priced their monthly service packages on a national basis. National pricing, however, merely averages the price increase from the merger across all consumers. Unless the elasticity of demand for DBS averaged across all consumers is very large, a commitment to national pricing would not eliminate concerns that the merger would lead to higher prices for all consumers.

²⁵ Offsetting this effect is the fact that marginal cost is lower for legacy subscribers than for new subscribers because the subscriber acquisition cost for legacy subscribers has already been sunk. This was taken into account in the simulation model developed by the authors that estimated the incentives of New EchoStar to raise prices over time.

²⁶ See Klemperer (1987) for a general discussion of the competitive significance of switching costs and Wise and Duwadi (2005) for a specific application to DBS demand.

To see why a commitment to national pricing would not protect all consumers, note that the total demand for DBS services may be written as

$$Q_{DBS} = q_{DBS}^c(p_{DBS}) + q_{DBS}^{nc}(p_{DBS}),$$

where p_{DBS} is the uniform price of DBS service, q_{DBS}^c is the demand in cabled areas and q_{DBS}^{nc} is the demand in areas without cable access. The elasticity of total demand for DBS with respect to a uniform price is

$$h_{DBS} = s^c h_{DBS}^c + s^{nc} h_{DBS}^{nc},$$

where s^c and s^{nc} are the shares of demand and h_{DBS}^c and h_{DBS}^{nc} are the elasticities of demand in cabled and non-cabled areas respectively.

The estimates of the elasticity of demand for DBS by Goolsbee and Petrin (2004) and others are estimates of the total demand elasticity, h_{DBS} . These estimates are low enough in magnitude to justify concerns that the merger would lead to an increase in national prices. To the extent that the elasticity of demand is lower in absolute value in areas without cable, New EchoStar would have an incentive to choose higher prices for customers in regions with no access to cable (or to digital cable) than in regions with cable access if it did not establish a single national price. The analysis leads to concerns about significant price increases from the merger for all groups of consumers; national pricing would simply average the price increases for all consumers.

Entry

If the competitive-effects analysis identifies significant concerns that a merger may harm competition, the next step in the analysis following the DOJ/FTC Horizontal Merger Guidelines is an evaluation of the potential for entry. The scope for entry to remedy any adverse competitive effects from the proposed merger of EchoStar and DirecTV was limited because the availability of orbital satellite positions is constrained by regulation.

EchoStar and DirecTV occupied the only three orbital satellite slots that were capable of providing full-CONUS coverage for DBS broadcasts using technology available at the time of the proposed merger, located at 101°, 110°, and 119° W.L. The only slots not controlled by either EchoStar or DirecTV at the time of the proposed merger were at 148° W.L. and 61.5° W.L. If a new entrant offers DBS service using a satellite at either of these “wing” locations, the signal from the satellite would have difficulty reaching both coasts due to the curvature of the earth. Full-CONUS coverage would require at least two satellites, which would greatly increase the cost of entry. Furthermore, a back-up satellite would be required at each location in case of equipment failure. Thus entry at the wing slots would be much more expensive than entry using a full CONUS slot, and probably would be impractical, even under the assumption that access to the wing slots would have been possible.

Technological advances have made it feasible to locate satellites closer together than nine degrees of longitude to serve the same geographic area without creating harmful interference with each other, and this has been done for satellites that broadcast to Europe (Spectrum Five LLC 2004, p. 3). Nevertheless, entry would be extremely difficult because a new DBS carrier would have to obtain regulatory approvals for entry at a “short-spaced” orbital location, likely over the objections of New EchoStar. Furthermore, a new competitor would have to invest billions to design, construct, and launch satellites, design and manufacture set-top boxes and dishes, negotiate contracts for programming (some of which was licensed exclusively to either EchoStar or DirecTV), and create a distribution and installation network for the satellite and ground technology necessary to provide a nationwide DBS service.

No new entry has occurred by a competitor offering nationwide DBS service since the launches of DirecTV and EchoStar. In April 2002, SES Americom filed a proposal to locate a new short-spaced satellite at 105.5° W.L., and in February 2005 Intelsat filed applications for new DBS satellites at four orbital locations; however there has been no

regulatory action on these proposals as of early 2007.²⁷ Clearly, opportunities for entry are much more limited for potential new DBS carriers than is typical for new competitors in many other industries.

Along with the previously discussed commitment to national pricing, the parties proposed as a remedy for the competitive effects of the merger that they (i) divest or lease substantial transponder assets to Cablevision Systems Corporation, owner of R/L DBS Company (known as Rainbow), (ii) joint venture with Cablevision in the provision of set-top boxes and the transmission of local programming (called “local-into-local” broadcasts), and (iii) provide assistance to Cablevision in establishing retail outlets. Rainbow was the licensee of 11 frequencies at the easternmost U.S. DBS orbital slot at 61.5° W.L. The parties claimed that the additional assets and other assistance would enable Rainbow to be a nationwide DBS competitor, which was unlikely to occur without the assets and other assistance from the merged company.

It was difficult to see how the proposed remedy would create a new DBS competitor strong enough to replace competition lost by the merger and quickly enough to protect consumers from the loss of competition. The creation of a new nationwide DBS service is extremely expensive and, even if economically feasible, would be unlikely to occur within the two-year time horizon considered in the DOJ/FTC Merger Guidelines. The terms of assistance from the merged company would have to be monitored and enforced. Furthermore, the new company would have its feet in both the cable and DBS camps with Cablevision as its owner, which provided cable services in the New York–New England region.

Rainbow has not emerged as a significant DBS competitor, and likely would not have emerged as a significant competitor even with the assistance promised by EchoStar/DirecTV. In 2005, EchoStar acquired the orbital locations controlled by

²⁷ EchoStar and DirecTV also have filed proposals for new satellite locations. On June 23, 2006, the FCC issued a notice of proposed rulemaking to consider these requests (FCC 2006a).

Rainbow and has used them to offer additional high-definition and local programming (FCC 2005).

Efficiencies

Proponents of the merger argued that it would create substantial efficiencies, particularly in the use of scarce radio spectrum. By eliminating duplicative EchoStar and DirecTV channels, the parties argued that New EchoStar would be able to broadcast local channels to more communities, offer additional high-definition content, and be a more effective competitor to cable than either company could be on its own (Willig 2001, p. 4). There is significant overlap in the satellite broadcasts by EchoStar and DirecTV. The two firms had duplicative national programming on 150 channels and duplicative local programming in 140–175 channels, for a total of 290–325 redundant channels.

The parties claimed that the merger would enable the merged firm to provide local network programming for 100 DMAs, additional high-definition programming, expanded programming for Alaska and Hawaii, greater programming diversity, and near video-on-demand (EchoStar et al. 2001). At the time of the proposed merger, EchoStar and DirecTV beamed local network programming into about 40 DMAs, representing about 76 percent of U.S. television households.

EchoStar and DirecTV are like twin pipes from the sky, both of which are filled with nearly identical content. The efficiency argument is that New EchoStar would need only one pipe to broadcast the existing content, freeing up the other pipe for additional content, more local channels, or more programming in high-definition format.

Aftermath and reflections

EchoStar and DirecTV claimed that the merger would achieve significant improvements in DBS spectrum utilization and enable the merged company to be a more formidable competitor to cable. Furthermore, the efficiency argument implied a belief that neither DBS company, on its own, could or would make the improvements necessary to match the programming content provided by cable systems. In fact, both EchoStar and DirecTV

have found ways to increase capacity and expand programming both in absolute terms and relative to the programming content offered by digital cable systems. EchoStar currently offers a high-definition programming package with 26 channels and boasts that it has “America’s largest HD lineup” (EchoStar 2007). DirecTV offers eight channels and a number of regional sports networks in high definition (DirecTV 2007a). Both companies also offer pay-per-view, premium channels such as HBO and Showtime, and access to local broadcasts in high-definition format. In 2005, cable companies offered an average of 11.6 channels in high definition, which includes premium and local broadcast channels in addition to national networks, and the number of high-definition channels available on cable systems appears not to have increased substantially in the past two years.²⁸ Cable companies, however, have made strides in other enhancements to their networks, such as video-on-demand and Internet access.

The parties argued that the merger would give them the capacity to provide local broadcasts to about 100 DMAs, compared to the roughly 40 DMAs served before the proposed merger. In fact, EchoStar and DirecTV have each surpassed their predictions of what they could achieve with the merger. By the end of 2006, EchoStar offered local broadcasts in more than 170 markets across the country, representing 96 percent of all U.S. television households (Ergen 2006). As of 2007, DirecTV offered local broadcasts in 143 markets across the country, reaching more than 94 percent of the nation’s TV households (DirecTV 2007b).

Experience demonstrates that the merger was not necessary to achieve many of the benefits that the parties promised would occur if EchoStar and DirecTV combined their operations. Since EchoStar and DirecTV abandoned their proposed merger, both companies increased programming content through gains in signal compression technology and by launching or acquiring additional satellites. For example, since January 1, 2002, EchoStar deployed four new satellites, and DirecTV deployed five. At

²⁸ According to one industry source, in 2007 most large cable TV systems offered about eight or nine HDTV stations, usually including HDTV versions of the major premium networks and a few other choices (CNET 2007).

\$200–\$300 million each, the new satellites cost upwards of \$2–3 billion. It is plausible that the merger would have eliminated the need for some or all of these new satellites, although to achieve the benefits of consolidation the parties would have had to invest considerable sums to replace the incompatible platforms of EchoStar and DirecTV with a single platform for the merged company.

The billion-dollar question is whether consumers would have been better off if EchoStar and DirecTV were allowed to merge. The merger might have allowed the companies to economize on satellite launches, and while New EchoStar would be the direct beneficiary of any savings, some of the benefits could have flowed to consumers. However, the merger posed a considerable risk of higher prices from the exercise of market power. The analysis earlier in this chapter estimated that the merger could allow New EchoStar to increase prices by as much as \$10 per month.²⁹ Even if the merger increased prices by only \$2 per month, this would increase consumer expenditures by more than \$500 million per year for DBS service, which likely would exceed the plausible annualized efficiencies from the merger.^{30,31} Of course the tradeoff would be more favorable to the proposed merger if the welfare measure included a contribution from producer profits.

Soon after EchoStar and DirecTV abandoned their proposed merger in response to objections from the DOJ and the FCC, News Corp. acquired a controlling interest in DirecTV, which the FCC approved with non-discrimination provisions in 2003 (FCC

²⁹ The gap between actual cable and DBS prices appears to be large enough to permit such a price increase. In 2005, EchoStar service cost about \$43 per month for about 100 channels and local broadcast networks, while the average cost of digital cable with expanded analog channels was about \$56 per month (FCC 2006b). However these numbers should be interpreted with caution given differences in programming packages, installation costs, and equipment fees.

³⁰ This calculation is based on 26 million DBS subscribers as of June 2005 (FCC, 2005). A price increase of \$2 per month is about five percent of the average price for DBS service in 2005. Assuming a DBS own-price elasticity of -2.5 , a five percent price increase would reduce the number of DBS subscribers to about 23 million.

³¹ MacAvoy (2002) estimated that the consumer harm from the merger would range from at least \$120 million to \$700 million per year solely for 2.5 million customers in rural areas that were not passed by cable.

2003a).³² It is conceivable that the News Corp purchase of equity in DirecTV in 2003 provided needed cash for DirecTV to upgrade its infrastructure, which would not have occurred in its absence. It is difficult to test this hypothesis because DirecTV does not disclose its financial results. However, EchoStar does report its financial performance, and the evidence suggests that cash flow was not a significant constraint on its investments. While EchoStar reported net negative income from 2000 to 2002, its reported net income was positive in every year from 2003 to 2006. In any event, unlike the horizontal combination of EchoStar and DirecTV, the News Corp. equity purchase in DirecTV was a primarily vertical transaction that did not raise the same level of competitive concerns as the proposed merger of EchoStar and DirecTV.

³² There were media reports that News Corp was in negotiations with General Motors in 2001 to buy DirecTV. See, for example, Grover (2001), Bryer (2001), and Cohen (2001). News Corp's efforts were preempted by EchoStar's merger bid, although ironically News Corp eventually won the prize.

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