Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Annual Report and Analysis of Competitive Market Conditions with Respect to Domestic and International Satellite Communications Services	)	IB Docket No. 06-67

FIRST REPORT

Adopted: March 22, 2007 **Released: March 26, 2007**

By the Commission: Commissioners Copps and Adelstein concurring and issuing separate statements; Commissioner Tate issuing a separate statement.

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I. EXECUTIVE SUMMARY

1. This is the first annual report by the Federal Communications Commission to the United States Congress on the status of competition in the market for domestic and international satellite communications services. In this Report, we conclude that there is effective competition in both wholesale and retail satellite services markets. The Report is retrospective, focusing on conditions prevailing in the satellite services marketplace from the beginning of the 2000 calendar year through the 2006 calendar year.

2. In this Report, the Commission concludes that the market for commercial communications satellite services is effectively competitive. We discuss the structure of the satellite communications services industry and describe six wholesale markets or groups of markets (three domestic and three international) and two retail markets or groups of markets (both domestic). Within these markets, we calculate a range of standard economic indicators commonly used to assess market conduct, concentration, and performance. We also discuss the Commission's policies regarding foreign participants' entry into the U.S. market, as well as U.S. companies' access to foreign markets.

3. For wholesale markets, we find that four competitors held 80 percent of the domestic transponders activated (Intelsat, SES Americom, PanAmSat and New Skies) during the relevant period. Subsequent to the collection of these data, Intelsat and PanAmSat merged, and SES and New Skies merged. We find relatively high profitability ratios for the major wholesale market participants coupled with limited and declining market power based on Lerner Index proxy measurements. We also note that participants in the network services markets continue to post significant revenues, even as they are experiencing increased competition from terrestrial providers.

4. For retail markets, we assess performance for the Satellite Digital Audio Radio Service market ("SDARS"), but have insufficient data to assess performance for satellite providers in the Fixed Wireless Broadband market. As expected for a relatively new service,

neither provider is currently profitable, but growth rates for both subscribers and revenues are high and revenues per user have begun to rise. Two-way satellite-based fixed wireless broadband service was first offered only in 2005, and satellite-based broadband of all types represents less that 1 percent of the U.S. broadband subscriber base. The sector does show growing subscriber up-take and increasing competition among three emerging providers. Because satellite-based multichannel video programming distributors ("MVPD") and mobile satellite services ("MSS") are discussed in other annual competition reports issued by the Commission, we do not address them here.

II. INTRODUCTION

5. This is the first annual report (the "Report") by the Federal Communications Commission ("the Commission") to the U.S. Congress on the status of competition in the markets for domestic and international satellite communications services, as required by section 4 of an Act of July 12, 2005, Pub. L. No. 109-34, 119 Stat. 377 (2005), which amended the Communications Satellite Act of 1962[1] and is codified at 47 U.S.C. § 703 ("section 703").

6. In section 703(b), Congress directed that the Commission include in this Report,

> "(1) an identification of the number and market share of competitors in domestic and international satellite markets; (2) an analysis of whether there is effective competition in the market for domestic and international satellite services; and (3) a list of any foreign nations in which legal or regulatory practices restrict access to the market for satellite services in such nation in a manner that undermines competition or favors a particular competitor or set of competitors."[2]

7. Although section 703(b)(2) directs this Report to analyze "whether there is effective competition in the market for domestic and international satellite services,"[3] the term "effective competition" is not defined in section 703 or in the context of satellite services more generally.[4] Accordingly, to analyze effective competition, we rely on a range of standard indicators commonly used for the assessment of effective competition.

A. Sources of Information

8. The information and analysis provided in this Report are based on a wide variety of publicly available sources. In March 2006, the International Bureau (the "Bureau") released a Public Notice (the "Notice") seeking data and information in order to evaluate satellite competition.[5] Seven parties submitted comments or reply comments in response to the Notice.[6]

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[1] 47 U.S.C. §§ 701 *et seq*.

[2] 47 U.S.C. § 703(b)(1)-(3).

[3] 47 U.S.C. § 703(b)(2).

[4] Although "effective competition" is defined in section 623 of the Communications Act of 1934, as amended (the "Act"), 47 U.S.C. § 543(l)(1), we find that the definition in section 623 is inapplicable to satellite communications services.

[5] *IB Invites Comment for Annual Report to Congress on Status of Competition in the Satellite Services Market*, Public Notice, 21 FCC Rcd. 2967 (2006) (the "*Notice*"). Although the *Notice* asked commenters to provide certain

(continued….)

9. In addition to information submitted in response to the Notice in this docket, we relied upon a wide variety of publicly available sources of industry data. These sources included: company filings with the Securities and Exchange Commission, data compiled and released by trade associations and by other government agencies, reports by securities analysts and other research companies and consultants, company news releases and websites, newspaper and periodical articles, and various public Commission filings, decisions, and databases. We also conducted numerous discussions with members of the industry, industry associations, industry observers, and financial analysts.

B. Structure and Analytical Approach of the Report

10. After a brief history of the satellite communications industry, the Report describes the relevant markets for commercial satellite communications services, in the U.S. and internationally, and evaluates market performance in this sector.[7] In the Market Structure discussion, we identify and describe the markets relevant to this competition analysis, including the leading market participants. We also measure market concentration, provide information on recent relevant mergers and other transactions, and review various conditions affecting the ability of additional providers or classes of providers to enter the market. In the Market Conduct Section, we explore the conduct of buyers and sellers in the market and, in the Market Performance Section, we assess the performance of market participants using a variety of economic indicators, including market shares, market concentration, profitability, revenues and subscriber levels. Finally, the Competition Assessment and Conclusion provides a summary of both the structural and the behavioral characteristics of the satellite industry found in the Report.

III. MARKET STRUCTURE

A. Summary

11. In this inaugural Report, we begin with a history that explains how the satellite communications industry attained its present broad outlines. Then we describe relevant markets in current satellite communications services that we use in our later economic analysis of the industry.

12. In this Report, we do not discuss satellite-based MVPD services because the Commission analyzes the overall video market in a separate annual report to Congress.[8]

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kinds of data and other information, we did not require commenters to provide such information, nor did we audit the data provided.

[6] Appendix A lists the commenters in this proceeding.

[7] The commercial satellite sector includes many diverse industries, including the manufacture of spacecraft and satellite ground equipment, and the manufacture of launch vehicles and provision of launch services. The sector also includes numerous service applications that utilize satellite technology platforms, including both communications services and non-communications services, such as earth remote sensing services, weather observation services, military applications, scientific research, and global positioning services. In this Report, we focus on the commercial satellite-based services sector and those applications that are within the definition of communications services under the Act. We do not evaluate the satellite manufacturing or launch sectors, nor do we assess non-communications satellite applications, as we view these as outside the scope of Congress' request.

[8] EchoStar asserts that we should not include this market in our report because it is covered in the Commission's annual *Video Competition Report*. EchoStar Comments at 1-5. We agree with EchoStar. *See Annual Assessment of*
(continued….)

Similarly, we do not discuss mobile satellite services, as they are encompassed in the Commission's annual report to Congress on Commercial Mobile Radio Service ("CMRS").[9]

B. Organizational Structure of the Satellite Communications Industry

1. Historical Review of Industry Structure Before 2000

13. Early legislative and regulatory decisions fostered the beginnings of international and domestic Fixed Satellite Services ("FSS") sector. In 1964, the United States and other nations formed what would become the intergovernmental organization, INTELSAT.[10] The *INTELSAT Agreement* entered into force on February 12, 1973. In 1965, Comsat placed the first U.S. commercial geostationary satellite into service to supplement communications facilities between the United States and Europe.[11] In 1966, the Commission opened a docket to explore questions associated with possible authorization of domestic communications satellite facilities to nongovernmental entities and, in 1970, the Commission adopted a policy of affording reasonable opportunity for entry into the domestic communications satellite field by qualified applicants.[12]

14. The Commission granted its first group of domestic FSS C-band authorizations in 1973.[13] By 1980, there were nine U.S. domestic satellites in orbit, all in the C-band.[14] Although the domestic satellite carriers initially provided service between a few general-purpose earth stations located near major metropolitan areas, they subsequently offered new and specialized

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the Status of Competition in the Market for the Delivery of Video Programming, Twelfth Annual Report, 21 FCC Rcd 2503 (2006) ("*Twelfth MVPD Competition Report*").

[9] *See, e.g., Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, Tenth Report, 20 FCC Rcd 15908 (2005).

[10] Agreement Establishing Interim Arrangements for a Global Commercial Communications Satellite System, Aug. 20, 1964, 15 U.S.T. 1705; Agreement Relating to the International Telecommunications Satellite Organization, Aug. 20, 1971, 23 U.S.T. 3813.

[11] *See Communications Satellite Corporation*, 38 FCC 1298 (1965); *see also Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 84 FCC 2d 584, 585, ¶ 5 (1981) ("*1980 Orbit Assignment Order*").

[12] *Establishment of Domestic Communications-Satellite Facilities by Non-Governmental Entities*, First Report and Order, 22 FCC 2d 86 (1970), Second Report and Order, 35 FCC 2d 844 (1972), *recon*., Memorandum Opinion and Order, 38 FCC 2d 665 (1972).

[13] *See Western Union Telegraph Company*, Orders and Authorizations, 38 FCC 2d 1197, 40 FCC 2d 1123, and 41 FCC 2d 379 (1973); *American Telephone and Telegraph Co*., Order and Authorization, 42 FCC 2d 654 (1973); *Comsat General Corp*., Orders and Authorizations, 42 FCC 2d 677 (1973) and 45 FCC 2d 444 (1974); *American Satellite Corporation*, Order and Authorization, 43 FCC 2d 348 (1973); *GTE Satellite Corp*., Order and Authorization, 43 FCC 2d 1141 (1973). *See also RCA Global Communications*, Order and Authorization, 42 FCC 2d 774 (1973) (authorizing interim commercial satellite system using Telesat Canada's satellites and U.S. earth stations).

[14] Western Union Telegraph Company, RCA Global Communications, and COMSAT General Corporation launched these satellites and put them into service in the mid- to late-1970s. *See 1980 Orbit Assignment Order*, 84 FCC 2d at 587, ¶ 7 & nn.9-12 (by December, 1980, Western Union Telegraph Company operated three satellites, RCA American Communications, Inc. operated two, COMSAT General Corporation operated three for use by AT&T and GTE Satellite Corporation, and the ninth satellite recently had been launched by Satellite Business Systems). *Id*.

communications services as carriers and users added additional earth stations to the networks.[15] During the 1970s, these U.S. domestic satellites ("domsats") provided FSS solely within the United States. International services were provided using INTELSAT space segment exclusively through COMSAT, a U.S. licensee, which served as the U.S. signatory to INTELSAT.

15. During the 1980s, the Commission granted an additional four groups of domestic FSS authorizations – in 1980, 1983, 1985, and 1988.[16] Beginning in 1981, the Commission had begun to authorize domestic satellites to operate in the additional Ku-band frequencies.[17] By late 1988, there were 42 existing and recently authorized domestic FSS satellites in the C- and Ku-bands, including eleven hybrids in those bands, an almost five-fold increase over the nine satellites that had been in orbit just eight years earlier.[18] Additionally, beginning in 1981, the Commission approved applications to use U.S. domsats to provide certain international services, conditioned on successful coordination with INTELSAT and the concurrence of other involved countries.[19] In keeping with U.S. obligations under the INTELSAT Treaty, most applications involved instances where use of the INTELSAT system clearly would be uneconomical or

[15] *Id.* at 587-88, ¶ 8 & nn.14-19. In the 1970s, the Commission approved customer-owned earth stations, distribution of diversified program material to cable television systems, the use of small, lower-cost antennas for transmission and reception, interconnection of non-commercial broadcast stations, carrier-provided earth stations directly on customer premises, and deregulation of receive-only earth stations. *Id.*

[16] *See 1980 Orbit Assignment Order*, 84 FCC 2d at 584; *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 94 FCC 2d 129 (1983), *recon*. FCC 84-32 (Feb. 2, 1984), *further recon.* (May 15, 1984); *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 50 Fed. Reg. 35228 (1985) ("*1985 Orbit Assignment Order*"), *recon. denied*, FCC 86-376 (rel. Aug. 26, 1986); *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 3 FCC Rcd 6972 (1988) ("*1988 Orbit Assignment Order*"). There was little overlap between the services provided by INTELSAT and domestic FSS operators. *See Transborder Satellite Video Services*, Memorandum Opinion, Order and Authorization, 88 FCC 2d 258 (1981) ("*Transborder Satellite Decision*") (permitting domestic satellite operators to provide international public telecommunications services within the coverage areas of their satellites, where INTELSAT did not provide the service or it was clearly uneconomical or impractical to use INTELSAT facilities for the service).

[17] *1980 Orbit Assignment Order*, 84 FCC 2d at 599, ¶ 56 & n.77 (authorizing two Ku-band systems and two hybrid C-/Ku-band systems).

[18] *1988 Orbit Assignment Order*, 3 FCC Rcd at 6973, ¶ 8 & n.30 (42 in-orbit satellites, including 11 hybrid satellites, in 51 C- and Ku-band orbital slots, authorized to eleven satellite companies). To maximize the number of satellites that could be accommodated in orbit in order to meet increasing demand for satellite service, in 1983 the Commission adopted a 2º spacing policy for both the C- and Ku-bands, which it adopted immediately for the Ku-band and implemented in 1985 for the C-band. *See Licensing of Space Stations in the Domestic Fixed-Satellite Service*, Report and Order, 54 Rad. Reg. 2d (P&F) 577, 589 (1983), *recon*., Memorandum Opinion and Order, 99 FCC 2d 737 (1985); *see also 1985 Orbit Assignment Order*, 50 Fed. Reg. at 35229, ¶ 2.

[19] *See Transborder Satellite Decision*, 88 FCC 2d 258 (permitting domestic satellite operators to provide international public telecommunications services within the coverage areas of their satellites, where INTELSAT did not provide the service or it was clearly uneconomical or impractical to use INTELSAT facilities for the service); *see also Amendment to the Commission's Regulatory Policies Government Domestic Fixed Satellites and Separate International Satellite Systems*, Notice of Proposed Rulemaking, 10 FCC Rcd 7789, 7790, ¶ 5 & n. 6 (1995) ("*DISCO I NPRM*") (describing implementation of Transborder Policy).

impractical.[20] Thus, there was little overlap between the services provided by INTELSAT and the U.S. domsats.

16. In the international arena, the Commission authorized the entry of new FSS "separate satellite" systems that began to compete with INTELSAT for international FSS services, including services to and from the United States.[21] Due to U.S. obligations under the INTELSAT Treaty, the authorized separate satellite systems were not permitted to utilize their capacity for domestic U.S. communications.[22] Therefore, the Commission made a clear distinction between those U.S.-licensed FSS satellite operators providing domestic satellite capacity and those providing international satellite capacity.

17. In the 1990s, the Commission allocated spectrum and issued service rules for multiple additional satellite services. Spectrum was allocated to create two new non-geostationary satellite services provided by constellations of low-Earth orbit ("LEO") satellites, the Little LEO[23] and Big LEO[24] services. Additional FSS spectrum was allocated for other geostationary satellites in the Ka-band,[25] and spectrum was allocated for non-geostationary satellite orbit systems in both the Ka-band and Ku-band satellite spectrum.[26]

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[20] *DISCO I NPRM*, 10 FCC Rcd at 7790, ¶ 5 (*e.g.,* the Commission allowed domsats to provide video programming to neighboring countries within their coverage areas, where use of INTELSAT would have required multiple satellite hops, terrestrial facilities, and collocated domestic and international earth stations).

[21] *Establishment of Satellite Systems Providing International Communications*, 101 FCC 2d 1046 (1985) ("*Separate Systems Decision*"), *recon*., 61 Rad. Reg. 2d (P&F) 649 (1986), *further recon*., 1 FCC Rcd 439 (1986) (permitting establishment of U.S. international satellite systems separate from Intelsat, but initially restricting separate systems to providing services through sale or long-term lease of capacity for communications not interconnected with public switched networks); *Permissible Services of U.S. Licensed International Communications Satellite Systems Separate from the International Telecommunications Satellite Organization (Intelsat)*, Order, 7 FCC Rcd 2313 (1992) (eliminating limitation on separate satellite systems interconnected with public switched network effective January 1, 1997), *recon. denied*, 8 FCC Rcd 5122 (1993).

[22] *See Separate Systems Decision*, 101 FCC 2d at 1172 & n.162.

[23] *Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum to the Fixed-Satellite Service and the Mobile-Satellite Service for Low-Earth Orbit Satellites*, Report and Order, 8 FCC Rcd 1812 (1993); *Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile-Satellite Service*, Report and Order, 8 FCC Rcd 8450 (1993).

[24] *Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1626.5 MHz and the 2483.5-2500 MHz Bands for Use by the Mobile-Satellite Service, Including Non-geostationary Satellites*, Report and Order, 9 FCC Rcd 536 (1994); *Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands*, Report and Order, 9 FCC Rcd 5936 (1994), *on recon*., 11 FCC Rcd 12861 (1996).

[25] *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, First Report and Order, 12 FCC Rcd 12545, Second Report and Order, 12 FCC Rcd 15082, Third Report and Order, 12 FCC Rcd 22310 (1997).

[26] *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-Band*, Report and Order and Further Notice of Proposed Rulemaking, 17 FCC Rcd 7841 (2002); *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ka-Band*, Report and Order, 18 FCC Rcd 14708 (2003).

18. In 1996, the Commission eliminated the regulatory dichotomy between the provision of international and domestic services.[27] As a result, U.S. international and domestic satellite providers began to provide both global and domestic U.S. satellite services. With the signing of the World Trade Organization ("WTO") Basic Telecom Agreement in 1997, the Commission adopted new rules and procedures for U.S. market entry by foreign satellite providers from WTO Member countries.[28]

19. In 1997, the Commission adopted rules for SDARS,[29] building on decisions to open spectrum for such services in the 1980s.[30] Market entry followed, with XM initiating service in 2002 and Sirius initiating service in 2003.[31] In addition, the Commission authorized two Worldspace spacecraft in non-SDARS bands, which provide digital audio radio services outside of the U.S. to subscribers in Asia, the Middle East, Africa, and Europe.[32]

2. Organizational Changes Since 2000

20. Today's FSS markets reflect several organizational changes occurring in the period from 2000 to the present, including the privatization of INTELSAT, various mergers and acquisitions, and new entry. In 2000, the intergovernmental organization INTELSAT competed in providing FSS satellite capacity for services to and from the United States with companies that, for the most part, also provided U.S. domestic FSS services: PanAmSat; GE Americom and its subsidiary Columbia Communications Corporation; Loral Skynet; and New Skies. Today, the

[27] *Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites and Separate International Satellite Systems, and Petition for Declaratory Ruling Regarding the Use of Transponders to Provide International DBS Service*, Report and Order, 11 FCC Rcd 2429 (1996) ("*DISCO I Order*") (adopting policy permitting all U.S.-licensed FSS, MSS, and DBS systems to offer both domestic and international services, removing "outdated" regulatory barriers to greater competition in satellite communications services by eliminating distinction between U.S. domestic and separate satellite systems and allowing both space- and earth-segment operators to provide both domestic and international services).

[28] *Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites and Separate International Satellite Systems, and Petition for Declaratory Ruling Regarding the Use of Transponders to Provide International DBS Service*, Report and Order, 12 FCC Rcd 24094 (1997) ("*DISCO II Order*"), First Order on Reconsideration, 15 FCC Rcd 7207 (1999) (adopting declaratory ruling procedure by which non-U.S. licensed satellite operators might request authority to provide space segment capacity service to licensed earth stations in the United States, where previously only U.S. earth station operator could request service from non-U.S. licensed satellite operator (Permitted Space Station List); also adopting procedure to permit U.S. earth station licensee to access particular non-U.S. licensed satellite without further approval (ALSAT designation)).

[29] SDARS is a radiocommunication service in which audio programming is digitally transmitted by one or more space stations directly to fixed, mobile, and/or portable stations, and which may involve complementary repeating terrestrial transmitters, telemetry, tracking and control facilities. 47 C.F.R. § 25.201; see also ¶¶ 55-57 *infra*.

[30] *Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, Report and Order, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 12 FCC Rcd 5754 (1997) (adopting rules to auction two 12.5 MHz SDARS authorizations in the 2320-2332.5 and 2332.5-2345 MHz frequency bands).

[31] *See Sirius Satellite Radio Inc., Application for Transfer of Control of Station Authorization*, Order, 18 FCC Rcd 215 (2003), and *XM Radio Inc.*, Order and Authorization, 20 FCC Rcd 1620, 1621, ¶ 3 (2005).

[32] *Application of Afrispace, Inc. for Authority to Construct, Launch, and Operate a Subregional Africa and Middle Eastern Satellite Sound Broadcasting Transmission System*, Order and Authorization, 15 FCC Rcd 1632 (1999); *Afrispace, Inc. Application for Authority to Launch and Operate a Replacement Satellite, AfriStar-2, at 21° E.L. and to Co-locate it with AfriStar-1*, Order and Authorization, 21 FCC Rcd 17 (2006).

commercial FSS sector in the United States is composed of two major participants and a number of smaller providers, including Loral Skynet; a number of foreign-licensed providers such as New Skies, Telesat Canada, and Satmex; and Direct Broadcast Satellite ("DBS") providers EchoStar, DirecTV, and Dominion Video Satellite, which hold FSS licenses. The two major providers of FSS transponder capacity are SES Global, through its subsidiaries SES Americom and New Skies, and Intelsat, the successor to the intergovernmental organization INTELSAT, which recently acquired FSS provider PanAmSat. Both entities compete internationally and in U.S. domestic FSS markets. Additionally, Loral Space and Communications and its partner, Canada's Public Sector Pension Investment Board, recently announced plans to acquire Telesat Canada.[33]

21. A major change in the FSS sector involved the privatization of INTELSAT. In 2000, Congress enacted the ORBIT Act to promote a more competitive global satellite communications services market for the benefit of consumers and providers of satellite service and equipment.[34] The ORBIT Act mandated the full privatization of the former intergovernmental satellite organization INTELSAT. In 2000, the Commission granted conditional licensing authority to Intelsat LLC, a separate, privately held U.S. corporation created by Intelsat to hold U.S. satellite authorizations and associated space segment assets.[35] In 2001, the Commission determined that, once INTELSAT privatized, the use of space segment operated by Intelsat LLC for services to, from and within the United States would not harm competition in the telecommunications market of the United States.[36] INTELSAT privatized later in 2001.[37] Its successor, the privately held company Intelsat, became a U.S. licensee. In 2004, Intelsat acquired certain satellite assets from Loral that permitted Intelsat to enter the U.S.

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[33] Loral Skynet, *Loral and PSP Investments Agree to Acquire Telesat Canada,* http://www.loralskynet.com/news_121806.asp (visited Dec. 29, 2006)

[34] Open-Market Reorganization for the Betterment of International Telecommunications Act, Pub. L. No. 106-180, 114 Stat. 48 (2000), *as amended*, Pub. L. No. 107-233, 116 Stat. 1480 (2002), *as amended*, Pub. L. No. 108-228, 118 Stat. 644 (2004), *as amended*, Pub. L. No. 108-371, 118 Stat. 1752 (2004), *as amended*, Pub. L. No. 109-34, 119 Stat. 377 (2005); *codified* at 47 U.S.C. § 761, *et seq*.

[35] *See Application of Intelsat LLC for Authority to Operate, and to Further Construct, Launch, and Operate C-band and Ku-band Satellites that Form a Global Communications System in Geostationary Orbit*, Memorandum Opinion, Order and Authorization, 15 FCC Rcd 15460 (2000), *recon. denied*, 15 FCC Rcd 25234 (2000), *further proceedings*, 16 FCC Rcd 12280 (2001). Under this licensing authority, the Commission permitted Intelsat LLC's licenses to become effective upon privatization (*i.e.*, the transfer of Intelsat's satellites and associated assets to Intelsat and the transfer of its International Telecommunications Union ("ITU") network filings to the U.S. registry). *See id.*, 15 FCC Rcd at 15461, ¶3.

[36] *See Application of Intelsat LLC for Authority to Operate, and to Further Construct, Launch, and Operate C-band and Ku-band Satellites that Form a Global Communications System in Geostationary Orbit*, Memorandum Opinion, Order and Authorization, 16 FCC Rcd 12280, 12303, ¶¶ 71, 73 (2001) ("*Intelsat LLC ORBIT Act Compliance Order*") (finding that, although the Initial Public Offering ("IPO") required under the privatization requirements of the ORBIT Act had not yet been completed, INTELSAT would privatize in a manner consistent with the non-IPO privatization provisions of the ORBIT Act).

[37] Intelsat privatized and became a Commission license for its C- and Ku-band satellites and earth stations in July, 2001, transferring its assets to a commercial corporation, Intelsat. Intelsat is a U.K. licensee for its Ka-band facilities. *See Intelsat LLC ORBIT Act Compliance Order*.

domestic video distribution market.[38] In 2005, the Commission determined that Intelsat was in compliance with the final privatization requirement of the ORBIT Act.[39]

22. The privatization of Intelsat appears to have had a positive effect on the domestic U.S. market. Privatization has given Intelsat the opportunity to develop new services for the U.S. market that potentially will result in the expansion of service options and providers for U.S. customers.[40] The privatized companies compete more effectively in providing service to U.S. commercial and governmental customers, and compete freely for U.S. satellite business opportunities, which have increased competition in the U.S. market.[41] Privatization also appears to have had a positive impact on the global marketplace for satellite communications services.[42]

3. Current Industry Revenues

23. The Satellite Industry Association ("SIA") estimates, based on a mid-year 2006 study prepared by Futron Corporation (the "SIA/Futron Study"), that the world commercial satellite communications industry generated $88.8 billion in 2005, up 7.4% from $82.7 billion in 2004, and posted an annual growth of 6.7% for the period 2000-2005.[43] The SIA/Futron Study estimates that revenues from commercial satellite communications services amounted to $52.8 billion in 2005, or 60% of overall satellite sector revenues in 2005, up from only 45% in 2000.[44] The SIA/Futron Study estimates that global revenues from retail services represented $45.5

[38] *Loral Satellite, Inc. (Debtor-in-Possession) and Loral Spacecom Corporation (Debtor-in-Possession), Assignors, and Intelsat North America, LLC, Assignee, Applications for Consent to Assignments of Space Station Authorizations and Petition for Declaratory Ruling under Section 310(b)(4) of the Communications Act of 1934, as Amended*, Order and Authorization, 19 FCC Rcd 2404 (2004). Prior to the Loral acquisition in 2004, Intelsat offered virtually no U.S. domestic services. *Id.* at 2418, ¶ 32.

[39] In 2001, the Commission found that, although the Initial Public Offering ("IPO") required under the privatization requirements of the ORBIT Act had not yet been completed, Intelsat would privatize in a manner consistent with the non-IPO privatization provisions of the ORBIT Act, upon completion of its plans to distribute Intelsat LLC shares to its Signatories. Intelsat later distributed shares to its Signatories as it had planned. *Intelsat LLC ORBIT Act Compliance Order*, 16 FCC Rcd at 12290, ¶ 71. In October 2004, Congress amended the ORBIT Act, adding sections 621(5)(F) and (G), to provide a certification process as an alternative to the IPO requirements under sections 621(5)(A) and (B). 47 U.S.C. § 763(A)-(B), (F)-(G). In December 2004, the Commission, on delegated authority, authorized the transfer of control of Intelsat's licenses and authorizations to Zeus Holdings Limited (now Intelsat Holdings), a private equity group organized under the laws of Bermuda. *See Intelsat, Ltd., Transferor, and Zeus Holdings Limited, Transferee, Consolidated Application for Consent to Transfer of Control of Holders of Title II and Title III Authorizations and Petition for Declaratory Ruling Under Section 310 of the Communications Act, as Amended*, Order and Authorization, 19 FCC Rcd 24820 (2004). In April, 2005, the Commission determined that Intelsat's certification was in compliance with sections 621(5)(F) and 621(5)(G) of the ORBIT Act. *See Intelsat, Ltd., Petition for Declaratory Ruling that Intelsat, Ltd. Complies with Section 621(5)(F) of the ORBIT Act*, Memorandum Opinion and Order, 20 FCC Rcd 8604 (2005).

[40] *FCC Report to Congress as Required by the ORBIT Act*, Seventh Report, 21 FCC Rcd 6740, 6757 (2006) ("*Seventh ORBIT Report*").

[41] *Id.*, 21 FCC Rcd at 6756.

[42] *Id*.

[43] Satellite Industry Association and Futron Corporation, "Satellite Industry Indicators Fact Sheet," June 2006, at 3. The SIA/Futron Study does not include non-communications satellite services.

[44] *Id.* at 7.

billion or 86% of 2005 services revenues, with wholesale services representing the remainder.[45] For the United States only, The SIA/Futron Study estimates service revenues at $24 billion in 2005, up from $19.5 billion in 2004, with retail satellite services revenues representing 88.7% and wholesale satellite service revenues contributing 11.2%.[46]

C. Market Description and Identification of Market Participants

1. Summary

24. Consistent with accepted methods of analyzing competition in a business, this Report next describes relevant markets. Specifically, we describe three national wholesale product markets, each consisting of communications capacity that is provided to business and government customers within the United States.[47] We also describe two national retail product markets, each consisting of communications services provided to retail consumers within the United States. Several of these product markets may be groupings of smaller identifiable product markets that we have grouped to facilitate analysis.[48] Finally, we describe three international product markets each of which consists of communications service, wholesale or retail, between points in the United States and points in foreign countries. To simplify analysis, we do not consider each international route separately as we might in other contexts.

25. The markets and groups of markets we describe in this Report are:

- Domestic
  - Wholesale Services
    - Capacity for Video Contribution
    - Capacity for Video Distribution
    - Network Services
  - Retail Services
    - Fixed Satellite Broadband Services
    - SDARS
- International
  - Wholesale Services
    - Capacity for Video Contribution
    - Capacity for Video Distribution
    - Network Services

26. In this Report, we do not include two retail markets with satellite-based participants because they are analyzed elsewhere in annual competition reports provided by the

[45] *Id.* at 8-10.

[46] *Id.*

[47] *See Constellation, LLC and Intelsat Holdings, Ltd., Application for Transfer of Control of PanAmSat Licensee Corp.,* Memorandum Opinion and Order, 21 FCC Rcd 7368, 7375 ¶¶ 31-32 (2006) ("*Intelsat-PanAmSat Order*").

[48] Any individual proceeding in which the Commission defines relevant product and geographic markets, such as an application for approval of a license transfer or a rulemaking with respect to the Commission's ownership rules, may present facts pointing to narrower or broader markets than any used, suggested, or implied in this Report. We note that markets can evolve and change over time.

Commission to Congress.[49] Satellite-based MVPD providers are part of the broader MVPD market that is analyzed in the Commission's annual video competition report. Similarly, mobile satellite services providers are participants in the broader CMRS market that is discussed in Commission's annual CMRS competition report.

27. We emphasize that the market descriptions included in this Report are intended to facilitate discussion of satellite markets and services as required by section 703, and may not reflect the appropriate markets to be considered in other Commission proceedings, including merger reviews, rulemakings involving the Commission's ownership rules, or other reports to Congress.

2. The Relevant Market and Market Participant Concepts

28. Relevant Market. Describing the "relevant market," a concept drawn from antitrust law, is the first step in assessing whether "effective competition"[50] or market power exists in a market.[51] A relevant market has both product and geographic dimensions. When a relevant market has been described in both dimensions, market participants can be identified. Then, the participants' economic significance in the market can be measured and the presence of competition determined.

29. In this Report, we draw on the relevant market concept to identify the product and geographic markets in which providers of satellite communications services compete with each other and with service providers that use non-satellite technologies. In describing relevant markets, we rely on antitrust law, economic theory, and the U.S. Department of Justice and Federal Trade Commission *Horizontal Merger Guidelines* ("*Merger Guidelines*").[52] Although this Report is not an analysis of a proposed merger, the *Merger Guidelines* provide useful principles for the analysis of competition in satellite communications markets.

30. Antitrust case law and economic theory describe the relevant product market by examining whether most consumers of a given product or service consider that there are close substitutes for the product or service, and whether there are other services that are reasonably interchangeable, even if not identical, for the same purposes.[53] The *Merger Guidelines* describe

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[49] *See supra* notes 8, 9.

[50] 47 U.S.C. § 703(b)(2).

[51] Market or monopoly power has been defined as the power to force a purchaser to do something that he would not do in a competitive market, *Eastman Kodak Co. v. Image Technical Services, Inc.,* 504 U.S. 451, 464 (1992), the ability to raise prices above those that would be charged in a competitive market, *Jefferson Parish Hospital Dist. No. 2 v. Hyde*, 466 U.S. 2, 27 n.46 (1984), the ability of a single seller to raise price and restrict output*, Fortner Enterprises, Inc. v. U.S. Steel Corp*., 394 U.S. 495, 503 (1969), and the power to control market prices or exclude competition, *United States v. E.I. du Pont de Nemours & Co*., 351 U.S. 377, 391 (1956).

[52] U.S. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines, 57 Fed. Reg. 41552 (dated Apr. 2, 1992, revised, Apr. 8, 1997) ("Merger Guidelines").

[53] *International Boxing Club of New York, Inc. v. United States,* 358 U.S. 242, 249 (1959), *citing United States v. E. I. Du pont De Nemours & Co*., 351 U.S. 371, 395 (1956) (in describing the relevant product market in Sherman Act cases, "no more definite rule can be declared than that commodities reasonably interchangeable by consumers for the same purposes make up that 'part of the trade or commerce,' monopolization of which may be illegal."). *See also Eastman Kodak Co. v. Image Technical Services, Inc*., 504 U.S. 451, 481-82 (1992) ("The relevant market for antitrust purposes is determined by the choices available to [consumers]."); *National Collegiate Athletic Ass'n v.*

(continued….)

a product market as the smallest group of competing services for which a hypothetical monopoly provider would profitably impose at least a small but significant and non-transitory price increase, presuming no change in the terms of sale of other services.[54] Both descriptions consider the availability of substitutes that would enable a customer to defeat an attempted increase in price or lowering in quality by a firm in the market.

31. The *Merger Guidelines* describe a geographic market as the area within which a hypothetical monopolist would profitably impose at least a small but significant and non-transitory increase in price, holding constant the terms of sale for all services produced elsewhere.[55] Antitrust precedent describes a geographic market similarly, as the area of effective competition, the area within which buyers can practically turn for alternative sources of supply, or the area in which there are sellers who could act to restrain the prices charged to those buyers.[56] The geographic market for a satellite communications service – the geographic area within which buyers can turn for alternative sources of supply – may be greater than nationwide because buyers may consider purchasing services on any satellite that can reach their particular geographic market within the United States, regardless of its ownership or physical location in space.

32. Market Participants. Once a relevant market is described, the next step is to identify the firms that participate in the market. According to the *Merger Guidelines*, market participants "include firms currently producing or selling the market's products in the market's geographic area."[57] Market participants can be large or small. A firm that has not yet entered the market and does not exercise a constraining influence on firms that are in the market is not a market participant. A firm that has not yet entered may be considered a market participant, however, if its entry is shown to be certain and significant or to influence the behavior of the firms that are currently producing or selling.[58]

(Continued from previous page)
Board of Regents of the University of Oklahoma, 468 U.S. 85, 95 (1984) ("The District Court defined the relevant market as 'live college football television' because it found that alternative programming has a significantly different and lesser audience appeal."); *United States v. Microsoft*, 253 F.3d 34, 52 (D.C. Cir. 2001), *cert. denied*, 534 U.S. 952 (2001) (in determining reasonable substitutes, the court excluded "middleware" software from the description of the relevant product market because of its present non-interchangeability with Windows notwithstanding its long-term future potential).

[54] Merger Guidelines §§ 1.11, 1.12.

[55] *Id.* § 1.21.

[56] *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321, 359 (1963); *Tampa Elec. Co. v. Nashville Coal Co*., 365 U.S. 320, 327 (1961); *Spirit Airlines, Inc. v. Northwest Airlines, Inc*., 431 F.3d 917, 932-33 (6th Cir. 2005).

[57] *Id.* §§ 1.0, 1.31.

[58] In our reviews of several previous mergers of major incumbent LECs, our competitive analysis focused on the likelihood that one would enter the other's territory and add to competition there, and on the reduction of competition that the proposed merger would cause. *See, e.g., NYNEX Corp. & Bell Atlantic Corp*., Memorandum Opinion and Order, 12 FCC Rcd 19985, 19990-91 ¶ 8, 20025-28 ¶¶ 73-78 (1997). Our analysis of another major merger considered the certainty of entry by broadband PCS carriers affecting the behavior of existing cellular carriers. *Craig O McCaw & AT&T*, Memorandum Opinion and Order, 9 FCC Rcd 5836, 5863, ¶ 40 (1994), *aff'd*, *SBC Communications, Inc. v. FCC*, 56 F.3d 1484, 1492 (D.C. Cir. 1995).

3. Introduction to Relevant Markets

33. In this Report, we examine competition in domestic and international relevant markets for satellite communications services. Each relevant market described in this Report is a service that uses a communications satellite as a platform. We examine several relevant markets, including "wholesale" (in which the product is capacity, an input to a service provided to business or retail consumers) and "retail" (in which the product is a service provided to consumers).[59] In some cases, we address a grouping of similar, smaller relevant markets together for analytical simplicity.

34. After we describe each relevant market, we identify or describe the "market participants," the firms that currently sell (or, in the case of most satellite communications services, provide service) in it.[60] In some cases, several firms own different components of a service – a communications satellite spacecraft, transmitting and/or receiving earth station(s), the other components of a communications service (*e.g.*, software, program content) and radio frequency licenses. In each such case, we list as the market participant the firm that controls the asset(s) that are most significant in providing the service. In many cases, this will be the owner of the communications satellite spacecraft. In some cases, however, the market participant we list may lease significant long-term capacity from the satellite owner in order to provide a value added or satellite networking service to customers. In those cases, we consider the latter company to be more significant and we list it as the market participant.

35. The relevant markets described in this Report may include market participants that use technology platforms other than communications satellites to provide services that compete with satellite providers. Recognizing intermodal competition is consistent with customary descriptions of relevant markets. Satellite technology is one technology platform, an input that can be used to provide a communications service. It is not uncommon for the same service – the same communications capability that a consumer uses – to be provided by differing platforms such as satellite, radio transmitters on the earth's surface ("terrestrial wireless"), and/or wires (copper, coaxial, or fiber optic). These different technologies afford consumers substantially the same capability. A provider of each of those services may have a constraining effect on the pricing and output of a provider of any of the others. The extent to which a terrestrial provider may compete with satellite-based providers, however, may be constrained by the geographic extent of its network, especially compared to the relatively large geographic coverage of satellites.

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[59] For a similar differentiation of wholesale and retail satellite communications markets, see *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7375, ¶ 31 ("it is useful to contrast the nature of competitive rivalry in *retail* satellite service markets, where customers are ordinary consumers buying, for example, multi-channel video programming services, and *wholesale* satellite service markets, where customers are business entities buying video transmission services by satellite for either contribution or distribution purposes.") (emphasis in original).

[60] Merger Guidelines § 1.31. Sellers in a market may also include "uncommitted entrants" – firms not currently producing or selling the relevant product in the relevant area who would likely enter the market within one year and without the expenditure of significant sunk costs of entry and exit, in response to a small but significant and nontransitory price increase. *Id.* at § 1.32. Neither the comments herein nor our own analyses have identified any uncommitted entrants. In general, entry into the markets discussed herein, even if it required only new earth stations or other terminal equipment, would entail significant sunk costs. *See* MSV Comments at 6. Entry entailing new radio licenses and satellites would entail such costs and also take more than one year.

4. Domestic Relevant Markets and Market Participants

36. We describe three wholesale product markets, each consisting of communications capacity that is provided to business and government users within the United States for their further provision to end users, and two retail product markets, each consisting of communications services provided directly to retail consumers (mostly individuals and households) within the United States.[61] These product markets are listed in Table 1. For each product market we discuss its market description and the market participants. We then discuss the geographic aspects of these three wholesale product markets.

[61] Unless otherwise specifically noted, the "United States" in this Report includes Alaska and Hawaii.

TABLE 1

DOMESTIC PRODUCT MARKETS

INVOLVING SATELLITE COMMUNICATIONS SERVICES

Wholesale Services	Capacity for Video Contribution Capacity for Video Distribution Network Services
Retail Services	Fixed Satellite Broadband Services Satellite Digital Audio Radio Services (SDARS)

a. Domestic Wholesale Markets

(i) Capacity for Video Contribution

37. Product Market. We describe this product market grouping as consisting of services offering point-to-point capacity for full-time contribution to, or occasional use by, providers of media services within the United States.[62] Services in this market transmit entertainment and news content from the location where they occur to the media company production facilities where they are edited and packaged for later broadcast and transmission to consumers.

38. These "video contribution" markets consist of a number of smaller markets that we discuss together in this Report. The smaller markets may show differing characteristics that affect the buyer-seller relationship, including variations in the recurrence of the service (full-time or occasional use), its predictability (pre-negotiated purchases versus spot purchases), and the terms of contracted service. These smaller product markets include full-time transmission of program content from the point of its origination, such as a content production studio, to the operational headquarters of cable TV companies, providers of DBS service, over-the-air broadcast networks[63] and stations, and syndicators, for further distribution.[64] These markets also include short-term, occasional, or "ad hoc" transmission of video content to the same media companies from locations of short-term interest, such as venues of breaking news or on-site interviews, political campaigns, or sporting events. Customers in these markets are broadcast TV networks and stations; syndicators; MVPDs, including wireline local exchange carriers

[62] This relevant market is comparable to what, in the *Intelsat-PanAmSat Order*, we described as "video contribution (transmission of news, sports, and other video programming from various locations to central video production studios), and occasional use video (short-term satellite services provided to broadcasters and others for coverage of sporting events, special events and breaking news)." *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7376, ¶ 35.

[63] We define "broadcast" for this Report as referring to "over-the-air" television stations using VHF and UHF radio spectrum, or, over-the-air radio stations using AM and FM spectrum. We define "broadcast network," for this Report, as an organization that offers programs for transmission to affiliated broadcast stations for a substantial number of hours per week. *See* 47 U.S.C. §§ 73.3613(a)(1), 74.2, 76.55(f).

[64] We define "syndicator" for this Report as a person, other than a network, who obtains rights to a program or group of programs and makes them available to MVPDs or broadcast stations for transmission to the latters' consumers.

("LECs")[65] in a growing number of areas; major independent networks; movie distributors; the National Rural Telecommunications Cooperative ("NRTC"); and some major sporting stadiums.

39. Market Participants. Satellite-based participants in these video contribution markets are FSS satellite operators, including Intelsat, Ltd. ("Intelsat," which recently merged with PanAmSat), Loral Space & Communications, Ltd. ("Loral"), and SES Americom, Inc. ("SES Americom"), teleports,[66] resellers and other specialized program providers engaged in occasional use for satellite news gathering.[67] EchoStar recently announced its entry into this market, providing news organizations ABC and CBS with capacity for election coverage.[68] Additional participants are large media entities, such as CBS, which self-supply some capacity. Also, on certain specific routes, terrestrial providers of communications transmission services are participants in this market.[69] The most prominent such providers are Level 3 Communications, Inc., AT&T Corp., and Verizon Communications Inc. Terrestrial distribution is available only from sites where terrestrial facilities (*e.g.,* wire, coaxial, fiber) are installed. Satellite distribution, in contrast, is potentially available to and from any point within the coverage area of a satellite.

40. Finally, all foreign-licensed FSS operators listed on the Commission's Permitted Space Station or "ALSAT" list[70] are market participants in this and other wholesale relevant markets described in this Report. As with all satellite technology, however, their ability to participate fully in this or other domestic markets may be limited by their spacecraft's geographic coverage.

(ii) Capacity for Video Distribution

41. Product Market. We describe this group of product markets to consist of capacity for the wholesale distribution of media content between points within in the United States. These "video distribution" markets consist of point-to-multipoint transmission of entertainment and news content, for example, from broadcast networks and syndicators to individual broadcast

[65] We define "local exchange carrier" or "LEC" for purposes of this Report as any person that is engaged in the provision of telecommunications service for a fee within a telephone exchange or its equivalent, or in the offering of access to an exchange for the purpose of the origination or termination of telephone toll services between stations in different exchange areas for which there is made a separate charge. See 47 U.S.C. §§ 153(16), (26), (47)-(48).

[66] A teleport is a large accumulation of connections to terrestrial facilities, earth stations and related equipment, and access to satellites that meet the high-volume needs of one or more consumers of satellite communications services. Some large enterprises operate their own teleports; some satellite owners operate teleports; and there are stand-alone teleport operators. The latter two kinds of operation serve groups of satellite consumers, no one of which needs enough capacity to create its own teleport. *See* Newton Telecom Dictionary 851 (16th ed. 2000).

[67] For simplicity, we usually name as market participants the parent companies in corporate structures, although a subsidiary may provide the service discussed.

[68] *Satellite*, Communications Daily at 12 (Nov. 24, 2006).

[69] SIA Comments at 9 n.23 (paraphrasing CNN executive that about one half of CNN's domestic news feeds arrive at its Atlanta headquarters over fiber optic terrestrial video paths).

[70] *Permitted Space Station List*, available at http://www.fcc.gov/ib/sd/se/permitted.html (visited July 12, 2006).

stations; from the hub locations of MVPDs and MVPD networks[71] to individual MVPD headends;[72] and from over-the-air broadcast stations over long distances to MVPD headends,[73] all for subsequent distribution to consumers (*i.e.,* viewers and listeners).[74] Customers in this grouping of markets are the same as in the above-described markets for Video Contribution.

42. Market Participants. Satellite-based participants in this group of product markets are FSS satellite operators, including Intelsat, Loral, and SES Americom,[75] as well as EchoStar Satellite, L.L.C. ("EchoStar").[76] Market participants also include some local and regional teleports such as Crawford Communications, Inc., and Ascent Media Group. Also participating in this market are the large media entities mentioned in paragraph 39 above, and, on a few routes, the terrestrial communications companies referred to in paragraph 39 above. Other potential participants are all foreign-licensed satellite operators listed on the Commission's ALSAT list.[77]

(iii) Network Services

43. Product Market. We describe this group of product markets as consisting of the provision of point-to-point telecommunications transmission paths to telecommunications operators and corporate users. This group has two major components.

44. The first component consists of "backbone" satellite capacity used for point-to-point trunking for voice, data, or Internet traffic, for backhaul[78] of communications services, and for redundancy and restoration of communications services when the primary cable and terrestrial wireless technologies fail.[79] This service includes backbone capacity to Alaska,

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[71] We define an "MVPD network," for purposes of this Report, as a stream of video content provided by its owner to an MVPD for transmission to the MVPD's retail consumers. Examples of MVPD networks would include CNN and ESPN.

[72] A headend is the central location of a cable TV system from which channels of video programming are sent via cable to the system's consumers. *See* Newton Telecom Dictionary 400 (16th ed. 2000).

[73] When a broadcast station's transmitter is close enough to an MVPD headend for the latter to receive the former's signal by radio and a simple antenna, in the same way viewers at home receive it, that medium may be used.

[74] This relevant market is comparable to what, in the *Intelsat-PanAmSat Order*, we described as "video distribution (transmission of programming to broadcasters, cable systems and other redistribution systems)." *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7376, ¶ 35.

[75] DirecTV Comments at 21 (*citing NRTC to Market SES Americom's IP-PRIME*, Press Release, available at http://www.nrtc.coop/export/main/news_policy/pdfreleases/2005_Press_Releases/NRTC_SES_final_final_release.pdf (visited Sept. 11, 2006)).

[76] EchoStar Comments at 6.

[77] *See supra* note 70.

[78] For purposes of this Report, we define "backhaul" as transmitting from a remote site or network to a central or main site, usually over a high capacity line and for purposes of efficient management. See, *e.g.*, PC Magazine, *Encyclopedia*, http://www.pcmag.com/encyclopedia_term/0,2542,t= backhaul&i=38356,00.asp (visited Oct. 23, 2006).

[79] This relevant market is comparable to what, in the *Intelsat-PanAmSat Order*, we described as "voice and data applications provided to telecommunications carriers (mostly point-to-point transmission between telecommunications hubs), . . . and Internet applications (including satellite capacity for Internet Protocol trunking and direct Internet access broadband connectivity)." *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7378, ¶ 41.

Hawaii, and tribal territories. Users of this capacity include facilities-based communications carriers (both wireline and wireless), paging service providers, business corporations, and parts of the United States government (both military and nonmilitary).

45. The participants in this component of the network services product market include FSS satellite operators such as Intelsat, Loral, and SES Americom; some teleport operators;[80] all foreign-licensed satellite operators listed on the ALSAT list;[81] and resellers of satellite capacity. Terrestrial wireline and wireless carriers also offer capacity for telecommunications backbone where they have network facilities. In addition, some carriers and government users may supply themselves with capacity for telecommunications backbone.

46. Other participants in this component of the network services market are "network integrators," which are companies that supply their retail customers with network services. Network integrators make use of a variety of communications platforms (or combination thereof), including both satellites and terrestrial wireline and wireless. These satellite applications may use existing teleports or build dedicated on-site earth stations called Very Small Aperture Terminals ("VSATs") and arrange with licensees and satellite owners for the remaining service inputs.[82]

47. The second component of the network services market consists of other fixed communications services between points within the United States. These services include the provision of both point-to-point and point-to-multipoint networks, and many kinds of specialized voice and data services for communicating within the United States between business enterprise hub locations and their many remote locations.[83] Subscribers to these services, unlike subscribers to the backbone services just described, often require the service provider to furnish receiving stations, ground integration, network integration, and other management services.

48. Corporate communications networks often use such fixed satellite-based services to reach widely dispersed locations or remote locations that do not have access to wireline facilities. Examples would include retail chains communicating with stores dispersed throughout the US; gas stations needing point-of-sale credit verification at rural crossroads; and communications networks established for remote work sites or places preparing for or struck by natural disasters.[84] Some of these fixed communications services have sporadic or uneven traffic patterns, such as those used for periodic inventory management and other tracking; digital signage; operation of automatic teller machines; other banking and financial services; credit card verification, and other short exchanges of data. Other fixed communications services provided

[80] Major teleport operators include Intelsat, SES Americom, Stratos, Loral, Globecomm, CapRock, and Ascent. World Teleport Ass'n, *Global Top Twenty of 2006,* http://www.worldteleport.org/displaycommon.cfm?an=1& subarticlenbr =301 (visited Oct. 3, 2006).

[81] See *supra* note 70.

[82] Some VSAT companies also own one or more central or hub earth stations that manage communications between a satellite and a VSAT.

[83] This relevant market is comparable to what, in the *Intelsat-PanAmSat Order*, we described as "corporate network applications (including point-to-point and point-to-multipoint traffic for one- and two-way communications among multiple business sites)." *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7378, ¶ 41.

[84] Adrianne Kroepsch, *FSS Operators Preparing for Hurricane Season*, Communications Daily at 12 (June 2, 2006).

by satellite have relatively steady traffic patterns, such as corporate communications networks for telephony, data, and Internet connectivity, or corporate television and radio services. Services in this product market can be IP-based or not, and symmetrical or asymmetrical. Most are narrowband, but some, such as corporate television, may be broadband. Customers in these markets are a wide range of business enterprises in many industries, parts of the United States government, and network integrators.

49. The satellite-based participants in this component of the network services market group include the FSS satellite operators Intelsat, Loral and SES Americom, which offer to enterprise and government customers both turn-key network services, and alternatively, wholesale satellite capacity that customers can use to meet their needs themselves. Other potential participants include all foreign-licensed FSS satellite operators listed on the ALSAT list.[85]

50. In addition, several VSAT companies, including Hughes Network Systems, LLC ("Hughes"); iDirect, Inc.; Gilat Satellite Networks Ltd. (including its U.S. subsidiary, Spacenet, Inc., hereinafter "Gilat"); and ViaSat, Inc., are participants in these markets.[86] Additional satellite-based participants include teleport operators which may offer connectivity for specialized enterprise or government networks. Terrestrial participants include providers of transmission via wire named in paragraph 39 above. Some military users and large enterprises (for example, the oilfield services provider, Schlumberger Limited, and Dow Jones & Company) self-supply some of their own fixed communications needs by satellite.

(iv) Geographic Markets for Wholesale Domestic Services

51. The *Merger Guidelines* describe the geographic market for a service as the area within which a hypothetical monopolist would profitably impose at least a small but significant and non-transitory price increase, or the area within which buyers can practically turn for alternative sources of supply.[87] The wholesale media markets described above include news sources, broadcast stations, and cable headends located throughout the United States. In addition, many major customers of wholesale telecommunications have business locations across the United States and require access to other points in the country, such as credit card data banks and suppliers. Accordingly, the geographic extent of the contribution and distribution product market groups described above is national.[88] The geographic extent of the network services market group is regional.

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[85] *See supra* note 70.

[86] *See generally Global VSAT Forum*, available at http://www.gvf.org/ (visited Oct. 4, 2006). Some of these VSAT companies are network integrators and others also manufacture some or all of the requisite network equipment. *Id.*

[87] *See supra* ¶ 30.

[88] Satellite technology allows for provision of services throughout wide geographic areas, although the amount and power of wholesale satellite capacity may vary from location to location. For example, due to their geographic separation from the 48 contiguous United States, satellite providers may need to add capacity in order to provide comparable services to Alaska and Hawaii.

b. Domestic Retail Markets

(i) Fixed Satellite Broadband Service

52. Product Market. For the purpose of this report, we describe this product market to consist of point-to-point high-speed or broadband fixed satellite Internet access service provided directly to retail customers within the United States for a fee.[89] Customers in these markets include the tens of millions of American residential and small office/home office ("SOHO") customers in rural and remote locations where terrestrial-based broadband has not been deployed.[90]

53. Geographic Markets. We describe the geographic dimension of these markets to be local to the extent that most consumers of this product are individual households or small businesses seeking broadband connectivity by whatever technological means available. Although satellite-based broadband providers tend to provide these services nationwide, terrestrial broadband providers such as cable TV companies and LECs remain the largest class of providers of this service in the United States. While many larger fixed broadband providers operate in many or all areas of the nation and offer similar data rates and terms to consumers nationwide, the mix of broadband providers available to any given consumer differs by locality.[91] According to the Commission's July 2006 report titled "High Speed Services for Internet Access: Status as of December 31, 2005," satellite technologies served at least one customer in 88% of U.S. zip codes, making it the most widely available technology for broadband in the U.S.[92]

54. Market Participants. The participants in these markets are several providers of broadband service utilizing FSS satellites: WildBlue Communications, Inc.,[93] Hughes, and Gilat (which offers Starband Service).[94] Additionally, one mobile satellite services operator, Inmarsat,

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[89] In this Report, we define "high-speed" or "broadband" as affording a bit rate of 200 kbps or more in at least one direction. *See* FCC, High-Speed Services for Internet Access: Status as of December 31, 2005, n.1 (rel. July 26, 2006) ("*High-Speed Services for Internet Access: 2005 Status Report*"), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-266596A1.pdf (visited Oct. 30, 2006). This report and previous releases of the High-Speed Services for Internet Access report are available at http://www.fcc.gov/wcb/iatd/comp.html.

[90] Terrestrial-based broadband service, where it is available, offers higher bit-rates at lower prices than satellite-based broadband service. *See High-Speed Services for Internet Access: 2005 Status Report* at 11. Therefore, for the purposes of this Report, we do not generally consider satellite-delivered broadband to be competitive with terrestrial-based broadband where the latter is available.

[91] Satellite-based broadband providers may also offer varying speeds or require different consumer ground equipment for certain locations, depending on coverage and power levels available. *See, e.g., Starband: Frequently Asked Questions*, available at http://www.starband.com/faqs/index.asp (visited Oct. 27, 2006).

[92] *High-Speed Services for Internet Access: 2005 Status Report,*at 4.

[93] DBS providers DirecTV and EchoStar have agreed to distribute WildBlue's broadband service to their customers. *Satellite,* Communications Daily at 15 (Oct. 23, 2006); *DirecTV, EchoStar to offer WildBlue high-speed Internet*, Los Angeles Business, available at http://www.bizjournals.com/losangeles/stories/2006/06/05/daily57.html (visited June 14, 2006). In some rural areas where AT&T is the incumbent LEC, it is marketing WildBlue's service. News Release, *AT&T Initiatives Expand Availability of Advanced Communications Technologies*, at 2 (May 8, 2006).

[94] *Who Is Starband?*, available at http://www.starband.com/whatis/index.asp (visited June 15, 2006); *Gilat Boundless Communications*, available at http://www.gilat.com/Solutions_BroadBandIP.asp (visited June 15, 2006).

Inc. ("Inmarsat"), through its resellers, offers fixed broadband service throughout the United States, including Alaska and Hawaii.[95] Another company, atContact Communications, LLC, intends to offer broadband services globally using both FSS and satellites in Highly Elliptical Orbit after launch of its spacecraft.[96]

(ii) Satellite Digital Audio Radio Services (SDARS)

55. Product Market. For the purpose of this Report, we describe this product market to consist of satellite audio programming provided to persons within the United States for a fee. The most prominent of these services is SDARS.

56. Geographic Markets. We find the geographic aspects of this market to be national. Individual customers face the same nationwide-licensed choices throughout the 48 contiguous states. Although each user is in one locality, the major participants in the market serve the entire country with mostly the same content.

57. Market Participants. The participants in this market are the two SDARS providers, XM and Sirius. XM is also expanding its focus through trial arrangements with several airlines.

5. International Relevant Markets

58. This Report examines those international markets that provide communications or other satellite-delivered services between a point in the United States and a point outside the United States.[97] Although an examination of competition in markets for satellite-delivered services entirely removed from the United States is beyond the scope of this Report, we will, as directed by Congress, examine barriers to U.S. satellite providers in such markets.[98]

59. Product Markets. We describe three groups of international product markets, each consisting of a wholesale communications service between one point in the United States and one point in a foreign country. There are many such product markets, one for each foreign country. For example, there is a product market for video contribution between the United States and Spain, and another for the same capacity between the United States and Japan. These product market groups are listed in Table 2.

TABLE 2

INTERNATIONAL PRODUCT MARKETS

[95] *Seventh ORBIT Report*, 21 FCC Rcd at 6749 (2006).

[95] *Broadband for a Mobile Planet,* http://broadband.inmarsat.com/ (visited Dec. 28, 2006).

[96] *ContactMEO Communications, LLC*, Order and Authorization, 21 FCC Rcd 4035 (2006).

[97] In determining the scope of this Report, we look to the Act, which on its terms applies to "all interstate and foreign communication by wire or radio and all interstate and foreign transmission of energy by radio, which originates and/or is received within the United States." 47 USC § 152(a). The Act further defines "foreign communication" to mean "communication . . . from or to any place in the United States to or from a foreign country, or between a station in the United States and a mobile station located outside the United States." 47 USC § 153(17). *See In the Matter of International Settlement Rates*, Report and Order, 12 FCC Rcd 19806, 19934, ¶ 278 (1997).

[98] *See infra* § III.E.5.

INVOLVING SATELLITE COMMUNICATIONS SERVICES

Wholesale Services	Capacity for Video Contribution Capacity for Video Distribution Network Services

60. Usually, product markets for international communications services are described on a route-by-route basis (*e.g.*, U.S.-to-Germany, U.S.-to-Poland).[99] This approach applies equally to the transmission of telecommunications and media content. For example, one international "capacity for video contribution" market would include FSS transmission of video content from the a news event in South Africa to the network hub of a television news organization located in the United States, or the transmission of video from a sporting event in the United States to the headquarters of a broadcaster in Japan. In the network services markets, international telecommunications carriers procure backbone capacity to meet the same point-to-point and point-to-multipoint needs as domestic carriers. Finally, many subscribers need fixed and mobile communications network services between the United States and foreign countries of the same kinds that domestic subscribers need. In some cases, satellite technologies may provide the only connectivity available for certain services or on certain routes.

61. Route-by-route analysis may seem to disregard satellite technology's ability to cover broad areas. Often, however, the decisive fact in describing international product markets is the legal and regulatory policies of each foreign government, not only the coverage area of its satellite or network. Nations differ significantly in their policies for "landing" international communications services, whether via terrestrial wireline connections or satellite receiving stations.[100] It is not unusual for a satellite-based service of one or more providers to be technically available in many countries, but for commercial availability of the service to differ among adjacent countries based on legal or regulatory policies.

62. Notwithstanding these potential differences, we will limit our discussion of these international markets in this part of this Report to the above descriptions. We provide only general analysis of competition in these international satellite markets. We believe that this analysis, in conjunction with our list of countries potentially raising barriers to entry by U.S. satellite providers, provides information indicative of the level of competition in the provision of international satellite services.[101]

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[99] *See, e.g., International Bureau Revises and Reissues the Commission's List of Foreign Telecommunications Carriers That Are Presumed to Possess Market Power in Foreign Telecommunications Markets*, Press Release, 19 FCC Rcd 20385, 20386 (2004) ("The Commission's rules include a presumption that a foreign carrier does not possess market power on the foreign end of a U.S. international route if it possesses less than 50 percent market share in each of three relevant foreign product markets"); *Lockheed Martin Corp. and Intelsat, Ltd.,* Order and Authorization, 17 FC Rcd 27732, 27741-43, ¶¶ 15-17 (2002).

[100] *See infra* § III.E.5 and Appendix B to this Report.

[101] The resources necessary to describe geographic markets for several services and perhaps two hundred countries would, in our opinion, go beyond the scope of what Congress intended for this Report. See *infra* § III.E.5 and

(continued….)

63. Geographic Markets. Most of the customers in the U.S. for international telecommunications or media services, like those of the wholesale services described above, are businesses and institutions that require communications connectivity among multiple locations around the globe or must link remote locations in the U.S. and a specific country or countries. The major participants in these markets are the service providers that market within all 50 U.S. states, but whose satellites may have regional or global coverage capability. The geographic aspects of those service offerings are therefore national.

D. Market Concentration

64. One measure of competition in a market is the actual number and size of firms participating in that market. Market concentration fluctuates with financial transactions such as mergers, acquisitions, bankruptcies, and restructurings. This Section reviews such transactions in the satellite communications sector since 2000. We then analyze data about market shares for some relevant markets and other market concentration measures, in order to contribute to our overall conclusion about competition in satellite communications markets.

1. Mergers and Other Transactions in Commercial Satellite Markets Since 2000

65. This Section describes recent organizational changes that have occurred in the U.S. commercial satellite services industry. These changes include company mergers and acquisitions, privatizations and public offerings, joint ventures, divestitures and other split-offs, bankruptcy reorganizations, and new entry. Mergers and acquisitions can eliminate a market participant and, at the same time, create a more competitive post-merger firm if the depth and breadth of its services are greater than before the merger. Other transactions, such as divestitures, split-offs, and new entry can create new market participants and add to the competitiveness of markets. The descriptions of organizational structure in this Section focus on the entities that own and operate satellite platforms, along with other facilities, and not on resellers or other service providers that might also be participants in a relevant market analysis.

66. The FSS sector is in the above-named wholesale markets, including Capacity for Video Contribution, Capacity for Video Distribution, and Network Services, as well in the retail market of Fixed Wireless Broadband Service. The sector's first three decades were shaped by mergers, acquisitions, and other transactions. For example, when the Commission removed barriers to providing both international and domestic services in 1996, it observed that the number of commercial entities providing domestic satellite services had declined from six in 1985 to three in 1996.[102] In 1997 and 1998, respectively, Loral Space and Communications, a new company formed in 1996, acquired AT&T Skynet and Orion Network Services.[103] In 1997,

(Continued from previous page)
Appendix B for several illustrative examples of varying legal and regulatory policies that might obstruct commercial availability of satellite services.

[102] *DISCO I Order*, 11 FCC Rcd at 2431, ¶ 11. *See also 1988 Orbit Assignment Order*, 3 FCC Rcd at 6973, ¶ 8 & n.30 (eleven companies assigned C- and Ku-band FSS orbital locations for 42 satellites); *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Order and Authorization, 11 FCC Rcd 13788, 13793, ¶ 9 & n.12 (1996) (eight companies assigned orbital locations for 44 satellites).

[103] *AT&T Corp., Assignor, and Loral SpaceCom Corporation, Assignee, For Authority to Assign the Licenses for Telstars 302, 303, 401, 402R, 5, and 6, and Associated Earth Station and Common Carrier Authorizations*, Order and Authorization, 12 FCC Rcd 925 (1997); *Loral Space and Communications Ltd. and Orion Network Systems,*
(continued….)

PanAmSat acquired the Galaxy fleet of satellites from Hughes.[104] During the period of 2000-2006, the sector experienced a series of mergers and acquisitions, including: (1) GE Americom's acquisition of Columbia Communications Corporation, which combined a predominantly domestic FSS provider with a predominantly international FSS provider (2000); (2) SES Global's acquisition of GE Americom and Columbia Communications Corporation, giving SES Global entry into U.S. markets (2001); (3) Intelsat's acquisition of Loral's North American satellites, providing Intelsat entry into the U.S. video distribution market (2004); (4) the split-off and divestiture of Hughes and its subsidiaries by General Motors, followed by the merger and acquisition of a controlling interest in Hughes by The News Corporation Limited (2004); (5) the private equity fund acquisitions of PanAmSat (2004) and Intelsat (2005); and (6) the recent acquisitions of New Skies by SES Global (2006), and of PanAmSat by Intelsat and the announced purchase of Telesat Canada by Loral Skynet (2006).

67. With regard to SDARS, in 2003, the Commission approved the restructuring of SDARS provider Sirius by granting authority to Sirius Satellite Radio Inc. to transfer control of its SDARS space station license to Sirius' creditors, none of which individually would have a controlling interest.[105]

2. Measures of Market Concentration

68. In this Section, we analyze data indicating market structure and ownership in wholesale and retail markets that include satellite services. We first discuss relevant measures of market concentration and then use these measures to examine the extent of market concentration in retail and wholesale markets for satellite services.

69. Measures of Market Concentration. There are various ways of measuring market concentration and the appropriate measure is generally dictated by the economic theory that best fits the behavior of the firms in the relevant market. The Herfindahl-Hirschman Index ("HHI") is a measure of concentration that takes into consideration the distribution of the size of firms in the market. HHI can measure to some extent whether one firm in a market has market power or whether conditions are conducive to collusion.[106] The HHI is used by courts, the Commission,

(Continued from previous page)
Inc. International Private Satellite Partners, L.P. d/b/a Orion Atlantic, L.P., Application for the Transfer of Control of Various Space Station, Earth Station, and Section 214 Authorizations, Order and Authorization, 12 FCC Rcd 4592 (1998).

[104] *Hughes Communications, Inc. and Affiliated Companies and Anselmo Group Voting Trust/PanAmSat Licensee Corp. and Affiliated Companies, Application for Transfer of Control and/or Assignment of Various Space Station, Earth Station, and Section 214 Authorizations*, Order and Authorization, 12 FCC Rcd 7534 (1997) (transferring control of PanAmSat to Hughes, assigning certain Hughes licenses to PanAmSat, and transferring control of certain Hughes subsidiaries to the new PanAmSat).

[105] *Sirius Satellite Radio Inc., Application for Transfer of Control of Station Authorization*, Order, 18 FCC Rcd 215 (2003).

[106] Cournot-Nash behavior occurs where firms maximize their profit by setting output, taking their rival's output as a given. Keith Cowling & Michael Waterson, "Price-Cost Margins and Market Structure," *Economica*, 43 (Aug. 1976), 264-274. The HHI can be used to detect cheating on collusive agreements. George J. Stigler, "A Theory of Oligopoly," *J. Pol. Econ.* 72 (1964) 44-61.

and is included in the *Merger Guidelines* as a preliminary screening test to detect market power in relevant markets.[107]

70. The HHI measures concentration in a market by calculating the market share of each market participant, squaring each market share, and adding the resulting sums. A market's HHI varies with the number of firms and the degree of inequality among firm size. Generally, the HHI increases as there are fewer and larger firms in the market. A market's HHI can range from nearly zero in the case of an atomistic market to 10,000 (100 squared) in the case of a monopoly.

71. Generally, horizontal concentration in differentiated product markets (*i.e.*, markets with products that are differentiated in terms of location, brand, and quality) may lead to situations where a specific market outcome is not due to coordinated interactions among firms, but due to the action of a single firm.[108] When analyzing differentiated product markets, the HHI may not be useful in analyzing market performance.[109] Instead, unilateral actions may be analyzed using demand characteristics of the merging firms and the "diversion ratio" – a measure of the fraction of sales going to firms offering substitute products.[110] Since firm-specific demand characteristics such as own- and cross-demand elasticities[111] and diversion ratios are theoretical concepts and are seldom calculated by individual firms, market shares are frequently used as a

[107] *See, e.g., Synthroid Marketing Litigation,* 325 F.3d 974 (7th Cir. 2003); *FTC v. H.J. Heinz Co.*, 246 F.3d 708, 716 (D.C. Cir. 2001); *Twelfth MVPD Competition Report,* 21 FCC Rcd at 2573-74, ¶ 153. The Merger Guidelines advocate the use of post-merger HHI and change in HHI due to merger as factors to consider when challenging a merger as being anticompetitive. Merger Guidelines § 1.5.

[108] More precisely, unilateral effects may arise in situations where firms sell products that substitute for each other, in varying degrees, so that any attempt by a single firm to raise price would fail because consumers would be able to switch to close substitutes. "A merger between two of these firms, however, may be profitable to the extent that the merger includes the firm to which enough of the customers switch. Since the price rise is initiated by a single firm, the competitive problem with such a merger is not coordinated behavior but rather is characterized as a 'unilateral effect.'" *See* John E. Kwoka & Lawrence J. White, *The Antitrust Revolution,* Third Edition, (Oxford University Press, 1999), p. 17.

[109] *See* Lawrence J. White, "Horizontal Merger Antitrust Enforcement: Some Historical Perspectives, Some Current Observations," prepared for the Antitrust Modernization Commission's "Economist's Roundtable on Merger Enforcement," Jan. 2006; John E. Kwoka, "Some Thoughts on Concentration, Market Shares, and Merger Enforcement Policy," paper presented at the FTC/DOJ Workshop on Merger Enforcement, Feb. 2004; Gregory J. Werden & George A. Rozanski, "The Application of Section 7 to Differentiated Products Industries: The Market Definition Dilemma," Antitrust, 8 (Summer 1994), 40-43; *but see* Daniel L. Rubinfeld, "Testimony before the Antitrust Modernization Commission," Jan. 19, 2006, available at http://www.amc.gov/commission_hearings/pdf/rubinfeld_statement_final.pdf (visited Nov. 16, 2006).

[110] *See* Federal Trade Commission & U.S. Department of Justice, *Commentary on the Horizontal Merger Guidelines*, March, 2006 at 27.

[111] Demand elasticity measures the degree to which the quantity demanded for a product or service changes as some attribute of the product, such as price, changes. Own-price elasticity of demand measures the degree to which the quantity demanded of a product or service itself changes as its price changes – for example, the percentage reduction in the quantity of apples demanded in response to a percentage increase in the price of apples. Cross-price elasticity of demand measures the degree to which the demand for *another* product changes if the price of a product changes – for example, the percentage increase in the quantity of oranges demanded in response to a percentage increase in the price of apples.

proxy for the diversion ratio.[112] To evaluate concentration in the wholesale satellite markets, we primarily rely upon market shares rather than HHIs, which may be misleading in markets with few players and those that establish price by negotiation.[113] For the retail satellite markets, we calculate both market shares and HHIs.

72. Concentration in Wholesale Markets. Using the market descriptions described in Section III.C above, we differentiate the relevant product markets between wholesale and retail markets. We then apply the appropriate measures of market concentration to determine the extent of concentration in domestic wholesale and retail product markets related to satellite services.

73. Given the highly differentiated nature of wholesale services – including the unique attributes of satellite transponder capacity in terms of frequency, power, bandwidth and geographic coverage, as well as the extensive use of long term, individually negotiated contracts – it is likely that the relative bargaining power of the buyer and seller will determine the price paid by the buyer in this type of market. In the *Intelsat-PanAmSat Order,* the Commission observed that prices in the markets for wholesale satellite communications services are determined somewhat differently than in the markets for retail services. First, the services in wholesale satellite markets are substantially differentiated from one another by frequency band, transponder power, and geographic coverage. Second, a buyer's utilization of a particular satellite communications service in the wholesale market usually involves a long-term, ongoing business relationship with the communications satellite carrier, not a "one-shot" impersonal purchase of a standardized "commodity" type of service. In fact, the purchase of wholesale services usually involves extensive negotiations between the communications satellite carrier and the buyer.[114]

74. We lack the requisite data to determine specific market shares for the retail relevant markets described in paragraphs 52-57 above. We do consider market share in analyzing the competitive relationship between firms in the wholesale satellite services market. Market shares may be measured in several different ways using different criteria, including, for example, revenues, value of the product, or capacity utilization.

75. Capacity utilization by fixed satellite operators is dynamic, shifting with customers' actual usage of contracted capacity, conclusion of new contracts, and the launch or

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[112] Kwoka notes,

> "To the extent that the market shares of the merging parties are related to the degree of competitive concern (as indicia of the diversion ratio, for example), that will also be reflected in higher measured concentration, other things equal. But the relationship between two firms' shares and overall concentration is loose, and in principle concentration itself – which reflects all firms' shares – is simply not the issue."

See Kwoka, *supra* note 108 at 4; Robert D. Willig, "Merger Analysis, Industrial Organization Theory, and Merger Guidelines," Brookings Papers on Economic Activity, Microeconomics, (1991) 281-332.

[113] We note, for example, that in the recent merger between Intelsat and PanAmSat, the Commission considered the bargaining relationships between suppliers and sellers rather than calculating HHIs in analyzing the competitive issues associated with the wholesale satellite markets identified in that proceeding. *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7382-401, ¶¶ 25-64.

[114] *Id.* at 7374, ¶ 29.

decommission of spacecraft. Table 3 provides a snapshot of fixed satellite transponder capacity as utilized by market participants in two domestic wholesale markets: (1) capacity used for video contribution and distribution; and (2) capacity used for network services. We note that Table 3 does not include data on capacity for video distribution and network services provided by other market participants, such as terrestrial providers or mobile satellite providers active in the network services markets. As a result, Table 3 does not constitute a complete analysis of market share. Because it does not include data on the capacity provided by other market participants, Table 3 most likely overstates each satellite operator's share of capacity. We also note that, because Futron's 2006 data were collected for the second quarter, it does not yet combine data for the subsequently merged entities of Intelsat and PanAmSat or of SES Americom and New Skies.

TABLE 3

SHARES OF UTILIZED TRANSPONDER CAPACITY

BY TYPES OF DOMESTIC WHOLESALE SERVICES[115]

Operators	Video Contribution and Distribution[116]		Network Services[117]	
	2001	2006	2001	2006
Intelsat	5%	15%	9%	42%
PanAmSat	33%	29%	10%	13%
Loral Skynet	23%	3%	25%	3%
SES Americom	33%	34%	37%	25%
New Skies	n/a	3%	n/a	9%
Other	7%	15%	20%	9%

Source: Futron Corporation.

76. Table 3 shows that in 2006 three fixed satellite operators (Intelsat, PanAmSat, and SES Americom) provided a majority of satellite transponder capacity in the wholesale video contribution and distribution services markets and the wholesale network services markets. In the *Intelsat-PanAmSat Order,* the Commission determined that SES Americom, PanAmSat, and Intelsat have respectively 31%, 34%, and 15% of transponder capacity sales for domestic network services.[118]

[115] Percentages reflect the operators' proportion of capacity actually utilized for each service for the United States for the second quarter of each year noted.

[116] The numbers include domestic wholesale markets for capacity for video contribution and capacity for video distribution.

[117] The numbers include domestic wholesale markets for network services.

[118] *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7389, ¶ 42.

77. Globally, industry consulting firm Euroconsult reports that Intelsat/PanAmSat and SES Global/New Skies Satellite account for 50% of the revenues from wholesale satellite services in 2005. Moreover, according to Euroconsult, the top 10 operators in the wholesale market for satellite services accounted for 87% of total wholesale market revenues in 2005.[119]

78. Concentration in Retail Markets. Unlike the wholesale market where satellite operators, resellers, LECs, and VSAT and teleport operators, face a relatively small number of buyers, sellers in the retail market face thousands and even millions of individual consumers, households, and businesses as potential buyers. Customers in the retail market do not have an individualized relationship with sellers except for critical services such as billing. Moreover, in some retail markets, all customers pay the same price for the same service, except for specific differentiation due to subscribers' choice of service tiers, promotional offers, or certain specific customer groupings.[120]

79. In retail markets, where sellers actively compete in terms of price and conditions of service, market concentration is expected to have a more pronounced effect on market behavior and price-cost margins. Ideally, the HHI measures market concentration in retail markets. Despite its relatively short history, we have sufficient data to calculate HHIs for the leading SDARS providers, as well as market shares based on revenues and subscribers. The following Table presents market shares and HHIs for this emerging market.

TABLE 4

MARKET CONCENTRATION IN SDARS

	2002	2003	2004	2005
XM Market Share (Revenue)	96.1%	87.7%	78.5%	69.7%
Sirius Market Share (Revenue)	3.8%	12.3%	21.5%	30.3%
HHI (Revenue)	9,262	7,843	6,627	5,779
XM (Subscribers)	92.1%	83.9%	73.6%	64.1%
Sirius (Subscribers)	7.9%	16.1%	26.1%	35.9%
HHI (Subscribers)	8,538	7,298	6,138	5,400

Source: Company Annual Reports.[121]

[119] Euroconsult, *Facts and Figures on the Performance of the Satellite Business Globally* (June 2006).

[120] *Intelsat-PanAmSat Order*, 21 FCC Rcd at 7385, ¶ 31. Also, retail markets differ from wholesale markets in one additional aspect, the former is generally more vertically integrated than the later. For example, retail markets for MVPD services and SDARS and other mobile media services are generally vertically integrated markets where satellite operators also have ownership interests in video and audio content distributed to retail customers.

[121] XM Satellite Radio Holdings, Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("XM 10-Ks"); Sirius Satellite Radio, (continued….)

80. The above Table shows that the two SDARS providers both have made significant progress in gaining new subscribers. The continuous decline in the HHI measure over the last four years is due to Sirius steadily increasing its share of revenues and subscribers over this period.

E. Market Entry Conditions

1. Introduction

81. In this Section we discuss significant factors that affect the ease with which potential participants may enter into satellite communications markets. This discussion includes an assessment of the industry's cost structure. We then evaluate the impact of spectrum allocations and orbital locations on entry and we explain U.S. government policies for market entry by foreign entities. We also review the public policies of foreign administrations about entry into their markets.

82. Entry is the construction of new facilities and/or the offering of service by a participant who was not in the market before. An entrant is a new market participant that can add capacity and competition to the relevant market in which it participates.[122] Generally, entry is considered significant if a participant can enter the market within two years from initial planning to significant market impact.[123]

83. From the beginning of the planning for a new communications satellite to its commencement of service to customers requires more than two years.[124] Entry relevant to this Report can occur, however, in new satellites that have moved far enough through the entry process that they will begin providing service within two years; by terrestrial wireless and wire-based entrants; and by existing satellites moving their capacity from one product market to another. Examples of the latter are a fixed satellite that began providing capacity for telecommunications backbone, exited that market, and entered the market for network services; and a satellite that began providing service to foreign markets, exited that market, and began providing service to a U.S. market.

(Continued from previous page)
Inc., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 (Sirius 10-Ks"), both available at http://www.sec.gov/edgar.shtml (visited July 12, 2006).

[122] As the Court of Appeals said in *Federal Trade Commission v. H.J. Heinz Co*., 246 F.3d 708, 717 n.13 (D.C. Cir. 2001):

> "Barriers to entry are important in evaluating whether market concentration statistics accurately reflect the . . . competitive picture. *Cf. Baker Hughes,* 908 F.2d at 987. If entry barriers are low, the threat of outside entry can significantly alter the anticompetitive effects of the merger by deterring the remaining entities from colluding or exercising market power. *See United States v. Falstaff Brewing Corp.,* 410 U.S. 526, 532-33, 93 S. Ct. 1096, 35 L. Ed. 2d 475 (1973); *Baker Hughes,* 908 F.2d at 987 ('In the absence of significant barriers, a company probably cannot maintain supracompetitive pricing for any length of time.')."

[123] Merger Guidelines § 3.2.

[124] *See Amendment of the Commission's Space Station Licensing Rules and Policies*, Notice of Proposed Rulemaking and First Report and Order, 17 FCC Rcd 3847, 3853 n.13 (2002) (*quoting Application of Comsat Corp.*, Order, 12 FCC Rcd 12059, 12075 n.68 (1997).

84. Barriers to entry into all markets exist, and can range from insignificant to virtually prohibitive. Sources of barriers to entry can be regulatory restraints, strategic behavior by incumbent market participants, and the scarcity of necessary inputs such as natural resources, uncommon human skills, and large amounts of capital. The following Section discusses the cost structure of the commercial satellite industry and its impact on the industry's structure, conduct, and the degree of competition in the industry.

2. Industry Cost Structure

85. The cost structure that typifies an industry influences both the extent of competitive entry and the nature of industry conduct. The cost of production as the output of a firm expands or contracts may significantly affect the extent to which competitors enter a given industry. Additionally, once a firm has committed to enter an industry, certain attributes of the cost of production, especially investment in durable assets used to produce output, will predispose the firm and its competitors toward certain behaviors that will affect the nature of competition observed in the industry.

86. The investment required to enter and operate in virtually any satellite communications markets is substantial, fixed, and largely sunk. The cost of production for any enterprise, including fixed and mobile communications satellite operators, may be classified as either variable or fixed. Variable costs vary directly, either increase or decrease, but not necessarily proportionately, with the quantity of output produced. Examples of such variable costs include hourly labor that varies with the level of production; materials and supplies used in production; electricity consumption; and other variable expenses. Fixed costs do not vary with the quantity of output produced and represent expenditures on inputs of production, including plant and equipment that imply a recurring monthly or annual economic rental rate, *i.e.*, charges for economic depreciation and interest, whether or not anything is produced using such fixed cost assets. In the satellite industry, fixed costs would include the manufacture of a communications satellite or constellation of satellites or the lease of satellite capacity,

87. Often, substantial investment in fixed cost assets is required to enter a market before any output is produced or sold to customers. Moreover, much if not all the substantial investment in fixed cost assets required to enter a new market may be sunk as well as fixed, *i.e.*, the fixed cost asset has no alternative use or economic value beyond the specific investment application required to produce output in a specific market. In other words, a sunk cost asset is a dedicated, irretrievable investment in capacity for producing a specific type of output that cannot be redeployed to produce output in a different market. For example, a communications satellite is a sunk cost investment in producing satellite communications services because it cannot be redeployed to produce terrestrial communications services. The requirement for an entrant in a market to make large investments in sunk cost assets tends to deter entry at the margin and consequently diminishes potential competitive rivalry relative to markets where substantial investment in sunk cost assets is not required.

88. Table 5 provides estimated proxy measures of annual economic variable and fixed costs of several communications satellite carriers that show the predominance of fixed costs in

the production of communications satellite services generally.[125] We note that data used in this table pre-dated the mergers between Intelsat and PanAmSat and SES and New Skies.

TABLE 5

ESTIMATED VARIABLE AND FIXED COSTS

FOR SELECTED SATELLITE CARRIERS

	Proxy Variable Cost ($ millions)[126] (1)	Replacement Value of Satellites ($ millions) (2)	Proxy Fixed Cost[127] ($ millions) (3)	Ratio of Fixed to Total Economic Cost [(3)/(1)+(3)]
Intelsat	438.1	8,400.0	1,554.0	0.78
PanAmSat	223.1	3,300.0	610.5	0.73
SES	483.8	8,472.0	1,567.3	0.79

Source: Company Annual Reports.[128]

89. Additions to investment in satellite capacity also tend to be lumpy or not easily divisible. In other words, satellite capacity cannot be augmented one transponder at a time in response to growth in demand for satellite communications services. Rather, given the large sunk cost of launching a communications satellite, it is much more economical to launch a satellite with transponder capacity sufficient to meet some level of forecast future demand even though such capacity will substantially exceed current demand levels.

[125] Metrics used are 'operating cost' as a proxy for variable cost and forward-looking 'platform' or network cost as a proxy for fixed cost. Operating expenses are taken from income statements and a weighted average cost of capital ("WACC") and an annual depreciation rate are applied to the estimated replacement value of an operator's satellite fleet to estimate platform cost. Not all data are available for all wholesale operators (for whom satellite capacity is much more 'commoditized' than for retail services) but sufficient data do exist to allow computation of these cost elements. The negotiated, long term contract nature of exchange transactions in this market do not necessitate a substantial base of customer support functions, product advertising and mass marketing so that the ratio of variable costs to the cost of the satellite network itself (including engineering and design cost) is relatively low.

[126] Operating costs from 2005 Income Statements (in Millions) are taken as a proxy for variable costs.

[127] Economic rental cost of satellite capacity was estimated based upon the replacement value of the satellite fleet as of 12/31/2005 multiplied by a weighted average cost of capital of 8.5% (the average for the Direct to Home firms as estimated by Bernstein) and an average depreciation rate based on a 12 year design life.

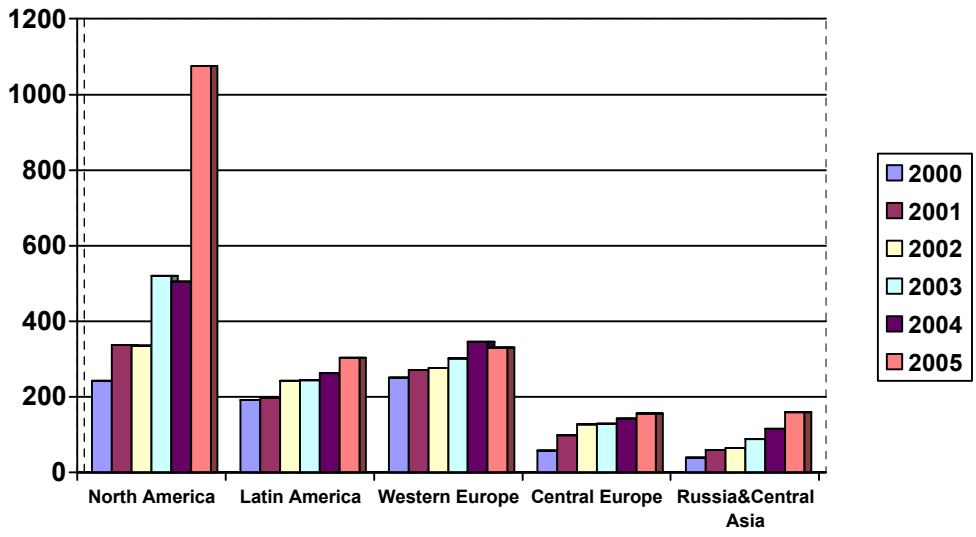
[128] Intelsat, Ltd., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("Intelsat 10-Ks"), available at http://www.sec.gov/edgar.shtml (visited July 12, 2006); PanAmSat Holding Corp., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("PanAmSat 10-Ks"), available at http://www.sec.gov/edgar.shtml (visited July 12, 2006); SES, Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("SES 10-Ks"), available at http://www.sec.gov/edgar.shtml (visited July 12, 2006).

90. In addition to requiring large fixed and sunk expenditures, therefore, entry into communications satellite services requires those investments in large increments or "lumps." A new satellite typically introduces much new capacity into the market and thus often creates excess capacity that lasts for a significant time. Charts 1-3, from Euroconsult, track the global "reference supply"[129] of transponders and global demand, illustrating the persistence of excess capacity through time in the satellite communications industry.

91. Regional data on excess transponder supply provides some insight on the distribution of excess capacity around the globe. Charts 1-3 present a time series of the discrete changes in the excess of transponder supply over demand by world region from 2000 through 2005.[130] While the aggregation of data within regions may create some distortions, there is a clear consistency across regions of an on-going excess supply, which is consistent with a lumpy capacity expansion process and uncertainty and variability of market demand.

CHARTS 1-2

EXCESS TRANSPONDER SUPPLY BY REGION



[129] Euroconsult defines "reference supply" as those transponders "that are effectively available for service, taking into account the date of launch, potential movement of satellites between different orbital positions, technical failures, and transponders reserved for failure." Euroconsult, *World Satellite Communication & Broadcasting Markets Survey, Ten Year Outlook*, 12th ed., (Paris, France, Aug. 2005), p. 1.

[130] In its report, Euroconsult assumes a 36 MHz transponder. The vertical axis of Charts 1-3 represents the number of 36 MHz transponders. *Id.*

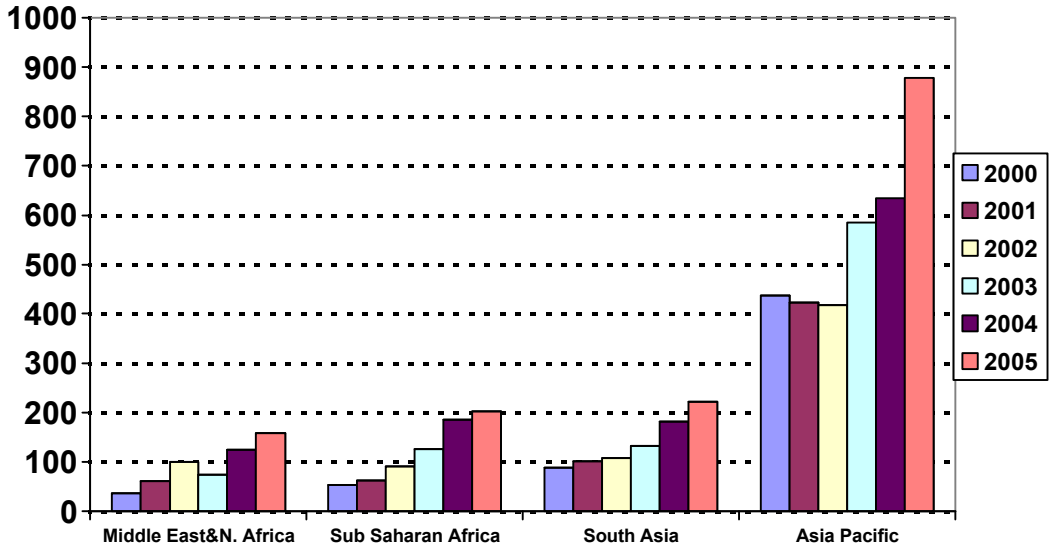
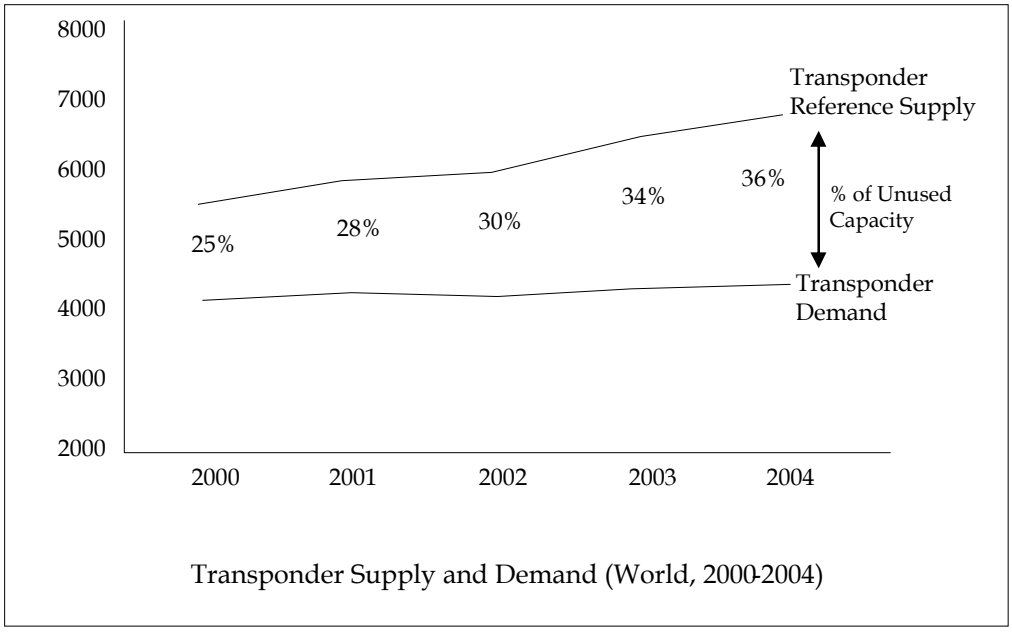


CHART 3

WORLDWIDE TRANSPONDER SUPPLY AND DEMAND



Source for Charts 1-3: *Euroconsult 2006 Report*.

92. The lumpy nature of investment and the consequent recurring excess capacity in the satellite communications industry predisposes satellite communications markets to a certain amount of inherent but predictable economic instability to which satellite operators must and do react. In other words, market equilibrium in the industry will appear to fluctuate as market demand and the extent of excess capacity vary over time. This economic instability is long-standing and well understood within the satellite industry. Satellite communications carriers have to varying degrees successfully managed these market dynamics to ameliorate fluctuations

in profitability as a result of capacity and price adjustments and shifts in market demand. To some extent, virtually all competitive markets exhibit fluctuations in profit, including losses, and unanticipated shifts in demand and prices. These instances of instability do not ordinarily cause otherwise efficient firms to exit the market or seriously impair the long term viability of such business enterprises.

3. Industry Dynamics

93. The discussion in this Section briefly reviews the factors that may contribute to fluctuations in demand that affect most portions of the satellite communications market. Satellite companies are institutionally aware of such shifts in demand and adapt to them by implementing discriminatory or non-linear pricing[131] policies, among other reactive or defensive behaviors.

94. One factor that shifts demand for transponder services is the substitution of fiber optic transmission facilities, both terrestrial and undersea cables, for many satellite transponder services. Demand reduction may be especially sharp when a new fiber optic cable is brought into service, given the huge transmission capacity of modern fiber optic cables. In some cases, however, satellite transponder services complement the transmission services provided by fiber optic transmission facilities by providing path redundancy or backup capacity. This increase in demand may offset to some extent the decline in demand attributable to the substitution of fiber optic facilities for satellite transmission services.

95. Another factor that can shift demand for satellite carriers is the purchasing policy decisions of major customers of satellite transponder services. Such customers include international providers of direct-to-home television services, sizable distributors of video content and U.S. government agencies. Decisions by these significant buyers whether to purchase or renew leases for multiple transponders can result in sharp fluctuations in the overall demand for transponder services.

96. New applications that employ transponder capacity can increase demand for satellite carriers. Growth in consumer demand for multichannel video services, satellite radio, and mobile telephony increases the demand for transponder capacity provided by satellite carriers that offer these retail services and for other satellite carriers that lease capacity to other operators for these services. General macroeconomic conditions, such as the business cycle, will also induce fluctuations in the demand facing satellite carriers.

97. On the supply side, the capacity expansion process can induce economic instability if the demand forecasts supporting the capacity expansion decision turn out to be excessively optimistic. A satellite carrier risks financial losses if its cost structure shifts as a result of expansion of capacity and outpaces the growth in demand. In other words, financial losses can result from both (1) sharp reductions in demand and (2) capacity expansion and shifts in the satellite carrier's cost structure that are predicated on forecast levels of demand that fail to develop or are delayed.

[131] Non-linear pricing refers to the pricing of output that varies with the quantity purchased. Typically, as the quantity purchased of a good or service increases, the unit price of successive units purchased *declines*. *See* Robert B. Wilson, *Nonlinear Pricing* (New York: Oxford University Press, 1993).

98. Finally, the entry of new satellite carriers can induce some element of instability into the overall market, at least in the short term. The entry of a new, facilities-based satellite operator increases industry supply, which may affect both equilibrium prices and the level of demand facing competitors. The entry of competitors offering innovative services may even, in the long term, enlarge the size of the relevant market or even create new markets.

99. Behavioral Implications. The foregoing discussion describes the market uncertainties faced by satellite carriers, which cause certain observed behaviors to offset these instabilities. These behaviors are interpreted here as defensive reactions to the persistent tendency toward economic instability in various segments of the satellite communications market. This chronic instability appears to be rooted in both the nature of the cost structure of satellite carriers and the fluctuating, uncertain demand for various types of transponder services. Most of the following behaviors help stabilize the satellite carrier's business environment and increase the likelihood of financial survival over the longer term. It appears that these behaviors are well established in the industry and seemingly effective in maintaining a measure of predictability and profitability.

100. Non-Linear Pricing. Satellite carriers create specific transponder "services" that effectively segment customers into self-selecting categories with transponder lease rates that reflect willingness to pay. Satellite carriers offer a diverse array of pricing criteria that may take into account quality of service, type and quantity of capacity leased, geographic coverage, and the length of lease period. As a result, price-cost margins will vary markedly between and among different transponder services notwithstanding the marginal cost similarity for most services.

101. Risk-Shifting and Revenue Stabilization. Given the dominance of fixed and sunk costs in the cost structure, satellite carriers offer strong financial incentives for customers to absorb some of the satellite carrier's risk of long term capital cost recovery. Satellite carriers offer transponder leases that extend for the operational life of a satellite, such as 15 years, which shifts some of the risk of capital recovery to the customer and stabilizes the cash flow of the satellite carrier. By leasing entire transponders or substantial fractions of a transponder for long periods, the satellite carrier protects against the revenue fluctuations resulting from unpredictable shifts in demand.

102. Mergers. The acquisition of competing satellite carriers not only reduces the number of rivals that the acquiring satellite carrier must face in various market segments and the potential competitive pressure on price-cost margins, but also reduces the risk of sudden revenue reduction should a customer not renew a transponder lease and lease instead from a competitor. Beyond realizing potential economies of scale and administrative efficiencies, the post-merger satellite carrier has additional satellite capacity for meeting more diverse customer requirements over a broader geographic area and additional capacity for increasing the level of protection for its transponder services.

103. Vertical Integration. Another strategy for stabilizing revenue for some satellite carriers, especially over the longer term, is vertically integrating into the production of a critical input of production. This strategy helps reduce the risk that the satellite carrier might lose customers should the supply of the critical input be interrupted or unavailable in either sufficient quantity or quality. Thus, a SDARS operator in retail markets may invest in the production of certain programming or commit to long-term contracts for the purchase of programming that it

considers to be essential to the building of a profitable subscriber base. In wholesale markets, a satellite carrier may vertically integrate into the production of spacecraft to minimize the hazards of market contracting with spacecraft manufacturers and to insure the timely availability of replacement satellites as a satellite fleet ages or encounters unexpected failures or service interruptions

104. Service Proliferation. An additional way that a satellite carrier may attempt to stabilize revenue is to broaden the scope of services offered to customers. So long as the additional services tend to complement rather than substitute for existing services, service proliferation can help exploit economies of scope that may be embedded in satellite technology viewed as a multi-purpose platform. Thus, a satellite carrier serving wholesale markets may combine its basic transmission services with network design and management services to offer customers a turnkey, multi-platform network solution that minimizes the technical competence required of the customer. Service proliferation provides a mechanism for the satellite carrier to forge long-term, durable, and flexible relationships with customers that reduces the risk of contract cancellation when the customer's requirements change.

105. Switching Costs. Although long term transponder leases contribute to revenue stability for a satellite carrier dealing with uncertain, fluctuating demand, such leases impose significant switching costs on customers that may want to terminate their transponder service contracts. Customers may also incur costs if they must re-point earth stations when changing satellite carriers. Taken together, these costs constrain the customer's flexibility to choose a different satellite carrier in response to a change in price or quality of service.[132]

4. Spectrum Allocation and Orbital Locations

106. In addition to requiring large financial investments, entry into satellite communications requires radio spectrum licenses and orbital slots. The lack of availability of commercial spectrum has the potential to create a significant barrier to entry into markets for commercial satellite communications services.[133] While technological advances have steadily increased the ability to fit more users into any given band, radio spectrum remains a finite resource.

107. The Commission has made policy choices that have reduced the potential entry-limiting effects associated with spectrum allocation and assignment. First, in spectrum allocation decisions, the Commission has increased the amount of spectrum available for the provision of satellite communications services over the past 10 years. The Commission has opened Ku-band and Ka-band spectrum for the provision of additional satellite services by non-geostationary satellite orbit service providers, sharing that spectrum with incumbent geostationary satellite services.[134]

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[132] For a useful overview of the general competitive implications of switching costs and "lock-in" effects, see Massimo Motta, *Competition Policy: Theory and Practice* (Cambridge, UK: Cambridge Univ. Press, 2004), pp. 79-81.

[133] One party commenting on the record in this proceeding suggests that satellite spectrum scarcity is the primary barrier to entry by satellite providers. *See* EchoStar Comments at 6.

[134] *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-Band*, Report and Order and Further Notice of Proposed Rulemaking, 17 FCC Rcd 7841 (2002);

(continued….)

108. Second, the Commission has progressively implemented a more flexible, market-oriented model of spectrum assignment for spectrum used to provide commercial satellite services. In the *First Space Station Reform Report and Order*, the Commission substantially revised the procedures for considering license applications, which had been in place since 1983.[135] The Commission adopted different processing procedures for each of the two kinds of orbits characterizing satellite systems: geostationary satellite orbit ("GSO")-like satellite systems; and non-geostationary satellite orbit ("NGSO")-like systems.

109. For NGSO-like satellites, which include NGSO satellite systems and GSO satellite systems using omni-directional user terminals (such as GSO mobile satellite systems), the Commission uses a modified processing round approach.[136] When an entity files an NGSO-like application that is not technically incompatible with any licensed system or previously filed NGSO-like application, the Commission issues a public notice inviting interested parties to file competing applications to be considered together with the first application. The Commission then divides the available spectrum equally among the qualified applicants.

110. For most GSO-like satellites, which comprise satellite systems using directional customer terminals, the Commission uses a first-come, first-served approach.[137] When an entity files a GSO-like application that is not technically incompatible with any licensed system or previously filed GSO-like application, the Commission will grant the application if the applicant is qualified without opening a processing round. With this first-come, first-served procedure, the Commission has reduced average processing time for new space station applications from several years to less than four months.[138]

111. The *First Space Station Reform Report and Order* also adopted other measures, including eliminating the satellite "anti-trafficking rule," which had prohibited satellite licensees from selling their licenses at a profit.[139] License purchasers are usually more willing and able than the sellers to complete construction of the satellite system. Making it easier for licensees to sell their licenses accelerates provision of service to the public. Moreover, eliminating the anti-trafficking rule can lead to a secondary market for satellites. By facilitating satellite licensees to sell unused spectrum to other parties willing to put the spectrum into use, the Commission allows parties flexibility to transfer satellite bandwidth to more efficient uses in response to changing market conditions and consumer demands, thus allowing marketplace forces to determine which companies succeed.

(Continued from previous page)
The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ka-Band, Report and Order, 18 FCC Rcd 14708 (2003).

[135] *Amendment Of The Commission's Space Station Licensing Rules And Policies*, First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 10760 (2003) ("*First Space Station Reform Order"*).

[136] *First Space Station Reform Order*, 18 FCC Rcd at 10774, ¶ 23.

[137] *Id.* at 10792, ¶ 73.

[138] The Commission is currently seeking comment on the appropriate processing framework to apply to DBS applications. *See Amendment of the Commission's Policies and Rules for Processing Applications in the Direct Broadcast Satellite Service, Feasibility of Reduced Orbital Spacing for Provision of Direct Broadcast Satellite Service in the United States,* Notice of Proposed Rulemaking, 21 FCC Rcd 9443 (2006).

[139] *First Space Station Reform Order*, 18 FCC Rcd at 10841, ¶ 215.

112. The net effect of these new, flexible, and market-oriented spectrum assignment procedures has been to help reduce entry barriers that may arise from government regulation of spectrum.

5. United States Market Entry Standard

a. U.S. Regulatory Policies for Market Entry

113. The United States market for satellite services is open to market entry by foreign satellite operators. The Commission has approved many foreign-licensed satellites for domestic communications,[140] and as discussed above in the Relevant Markets Section, such foreign satellite service providers are active market participants in the U.S.[141] In this Section, we review our policies regarding the provision of satellite services to the U.S. as a measure of an open regulatory regime.

114. World Trade Organization. Most satellite services are covered by WTO commitments, namely by the Agreement on Basic Telecommunications ("BTA") that is part of the General Agreement on Trade in Services ("GATS").[142] As part of its commitments under the GATS, the United States made market access commitments for all satellite services, except for Direct to Home ("DTH"), DBS and SDARS.[143] The Commission's *DISCO II Order*[144] implemented the satellite market-opening commitments made by the United States in the WTO BTA.[145]

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[140] Foreign operated satellites listed on the Permitted Space Station List may be accessed by any U.S.-licensed earth station with an ALSAT license. *See Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, First Order on Reconsideration ("*DISCO II First Reconsideration Order*"), 15 FCC Rcd 7207, 7213-16, ¶¶13-20 (1999). An unofficial list of satellites on the Permitted Space Station List is available at http://www.fcc.gov/ib/sd/se/permitted.html.

[141] *See, e.g., supra* ¶¶ 40, 49.

[142] The GATS is composed of three major components. The first consists of the general obligations and disciplines that apply to all WTO Members. The second includes the specific commitments relating to market access, national treatment, and other commitments that are identified in individual WTO Member Schedules of Specific Commitments. The third contains any exemptions taken by WTO Members from the general obligations that are contained in Article II of the GATS. In addition, all WTO Members must comply with the transparency obligations of Article III of the GATS, which requires prompt publication of all laws and regulations applicable to the provision of services.

[143] *See, e.g., EchoStar Satellite, LLC For Blanket Authorization to operate 1,000,000 Receive–Only Earth Stations to provide Direct-to-Home Fixed Satellite Service in the United States using the Canadian-authorized ANIK F3 Satellite at the 118.7 W.L. Orbital Location*, Order and Authorization ("*EchoStar Blanket Authorization*"), 20 FCC Rcd. 20083, 20084, ¶ 2 (2005).

[144] The U.S. also took an exemption from most-favored nation treatment for these services as well. *See Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Satellites Providing Domestic and International Service in the U.S.*, Report and Order, 12 FCC Rcd 24094 (1997).

[145] The WTO was established pursuant to the *Marrakesh Agreement Establishing the World Trade Organization* ("*Marrakesh Agreement*"), 33 I.L.M. 1125 (1994). The GATS is Annex iB of the *Marrakesh Agreement,* 33 I.L.M. 1167 (1994). The WTO Telecom Agreement was incorporated in the GATS by the Fourth Protocol to the GATS. 36 I.L.M. 354 (1997).

115. The *DISCO II Order* sets forth a presumption that entry by WTO Members to provide WTO-covered services would further competition in the United States.[146] As part of the competition analysis, the Commission adopted a presumption that entry by WTO Members to provide WTO-covered services would further competition in the United States.[147] Under this approach, companies from WTO Member countries seeking FCC authorizations to provide WTO-covered services in the U.S. are accorded national treatment (*i.e.*, considered the same as a domestic applicant). In evaluating requests from U.S. earth station operators to access a non-U.S.-licensed space station or in-orbit non-U.S.-licensed satellites to provide space segment capacity service to licensed earth stations in the United States, we apply a public interest framework that considers the effect on competition in the United States, spectrum availability, eligibility and operating requirements, national security, law enforcement, foreign policy and trade concerns.[148]

116. ECO-SAT. For services from non-WTO Members, or those services for which the United States did not make market access commitments (*i.e.,* DTH, DBS and SDARS), [149] the Commission applies the "effective competitive opportunities for satellites" ("ECO-SAT") analysis.[150] In a merger or other transaction where such services are at issue, the ECO-SAT analysis requires parties to demonstrate that U.S.-licensed satellite systems have effective competitive opportunities to provide analogous services in the non-U.S.-licensed space station's "home market" and, in certain cases, the non-U.S.-licensed space station's "route markets."[151] When the ECO-SAT test is not satisfied, the Commission will prohibit a satellite system from serving the U.S. market, unless there is a compelling public interest reason to do otherwise.[152] Specifically, the Commission considers "whether any additional countervailing public interest factors weigh in favor of a result different from the one we would reach under the ECO-SAT analysis alone."[153] In applying the ECO-SAT analysis to a small number of recent applications

[146] *DISCO II Order*, 12 FCC Rcd at 24112, ¶ 39.

[147] *Id.*

[148] *Id.* at 24107-72, ¶¶ 30-182. In the same Order, the Commission adopted rules for licensed earth station operators to request access to non-U.S. licensed space stations. In the *DISCO II First Reconsideration Order*, 15 FCC Rcd 7207 (1999), the Commission adopted similar rules for in-orbit non-U.S. licensed space stations to provide service to licensed earth station operators in the United States. In-orbit non-U.S. licensed space stations approved by the Commission are placed on the Permitted Space Station list which all routine licensed earth stations may communicate with. *DISCO II First Reconsideration Order* 15 FCC Rcd at 7214, ¶ 16. *See also International Bureau – Permitted Space Station List*, available at http://www.fcc.gov/ib/sd/se/permitted.html (visited Aug. 1, 2006).

[149] The United States did not make commitments for market access or most-favored nation treatment for DBS and SDARS. *See Fourth Protocol to the GATS*, 36 I.L.M. at 359. Member nations are permitted to take exemptions under certain circumstances specified in an annex to the GATS. *See GATS Annex on Article II Exemptions.*

[150] *DISCO II Order*, 12 FCC Rcd at 24127-37, ¶¶ 72-101; 47 C.F.R. § 25.137(a).

[151] *Id.* (both).

[152] *Amendment of the Commission's Regulatory Practices to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the U.S.*, Notice of Proposed Rulemaking ("*DISCO II NPRM*"), 11 FCC Rcd 18178, 18192, ¶ 38 (1996).

[153] *See, e.g., EchoStar Blanket Authorization,* 20 FCC Rcd at 20087-88, ¶ 11(*citing DISCO II NPRM*).

relating to services for which the U.S. did not make market access commitments, the Commission has determined that there were compelling public interest reasons to permit access to a non-U.S.-licensed space station despite the presence of a *de jure* barrier to entry in the non-U.S.-licensed space station's home market.[154]

b. New International Entrants to U.S. Markets

117. FSS. Following U.S. adoption of the WTO Basic Telecom Agreement in 1997, the Commission, in its *DISCO II* decision, established a Permitted Space Station List procedure by which non-U.S. licensed satellite operators providing FSS in the C- and Ku-bands might acquire authority to provide space segment capacity in the United States.[155] Permitted Space Station List operators include Telesat Canada,[156] Satelites Mexicanos, S.A. de C.V.,[157] New Skies Satellites N.V.,[158] Spacecom Satellite Communications Services (Israel),[159] Embratel (Brazil),[160] Loral Skynet do Brasil,[161] Eutelsat,[162] Hispasat S.A. (Spain),[163] Horizons Satellite LLC (Japan),[164]

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[154] *See EchoStar Blanket Authorization*, 20 FCC Rcd at 20087-88, ¶¶ 10-11, and 20089, ¶ 14 (notwithstanding Canadian regulations prohibiting use of U.S.-licensed space stations to offer one-way subscription video programming service to Canadian public, use of Telesat Canada's ANIK F3, a Canadian-licensed satellite, to receive DTH FSS provided public interest benefits by facilitating EchoStar's ability to provide coverage to Alaska and Hawaii and might promote competition for enhanced programming in those states).

[155] *DISCO II Order*, 12 FCC Rcd at 24094; *DISCO II First Reconsideration Order*, 15 FCC Rcd at 7207. Also, as discussed in Section III E 4 of this report, the *DISCO II* proceeding adopted the ALSAT procedure permitting U.S. earth station licensees to access particular non-U.S. licensed satellites without further approval, provided that the earth station complies with the Commission's technical requirements and operates under the conditions of its license.

[156] *See Telesat Canada, Petition for Declaratory Ruling for Inclusion of ANIK F1 on the Permitted Space Station List*, File No. SAT-PDR-20000420-00083, Order, 15 FCC Rcd 24828 (2000); *See Telesat Canada, Petition for Declaratory Ruling for Inclusion of ANIK F2 on the Permitted Space Station List and Petition to Serve the U.S. Market Using Ka-band Capacity on Anik F2*, 17 FCC Rcd 25287 (2002).

[157] *See Satelites Mexicanos, S.A. de C.V., Petition for Declaratory Ruling*, Order, 15 FCC Rcd 19311 (2000), *erratum*, 19 FCC Rcd 20427 (2004).

[158] *See New Skies Satellites N.V., Petition for Declaratory Ruling*, Order, 16 FCC Rcd 6740 (2001); *New Skies Satellites N.V., Petition for Declaratory Ruling*, Order, 17 FCC Rcd 10369 (2002). In 2006, SES Global acquired New Skies. *New Skies-SES GLOBAL*, 21 FCC Rcd 3194 (2006).

[159] *See Spacecom Satellite Communications Services S.C.C. Ltd, Petition for Declaratory Ruling for Inclusion of AMOS-2 on the Permitted Space Station List*, File No. SAT-PDR-20020823-00161, Order, 18 FCC Rcd 14433 (2003).

[160] *See Empresa Brasileira de Telecomicaçöes S.A., Petition for Declaratory Ruling on Access to Brasilsat A2 Satellite via U.S. Earth Stations*, File No. SAT-PDR-20000111-00047, Order, 16 FCC Rcd 655 (2001).

[161] *See Loral Skynet do Brasil, Petition for Declaratory Ruling to Add Estrela do Sul 1, a Ku-band Satellite, to the Permitted Space Station List*, File Nos. SAT-PDR-20021010-00196, SAT-WAV-20031202-00352, and S2474, Order, DA 03-4095 (rel. Dec. 23, 2003).

[162] *See European Telecommunications Satellite Organization (EUTELSAT), Petitions for Declaratory Ruling to Add EUTELSAT Satellites ATLANTIC BIRD™ 1 at 125º W.L. and ATLANTIC BIRD™ 2 at 8º W.L. to the Commission's Permitted Space Station List*, File Nos. SAT-PDR-10010118-00011 and SAT-PDR-20010207-00012, Order, 16 FCC Rcd 15961 (2001).

[163] *See Hispasat S.A., Petition for Declaratory Ruling for Inclusion of Hispasat-1B on the Permitted Space Station List*, File No. SAT-PDR-20020208-00016, Order, 18 FCC Rcd 3277 (2003); *Hispasat S.A., Petition for Declaratory*

(continued….)

Mabuhay Philippines Satellite Corp.,[165] Binariang Satellite Systems SDN BHD (Malaysia),[166] and Intelsat.[167]

6. Public Policies of Foreign Administrations

118. Satellites, more than any other technology platform, are technically well suited to provide communications services to a wide geographic area. "[D]ue to the flexible nature of satellite coverage, each satellite can cover various countries and can be available to all those countries within its footprint."[168] Moreover, some satellite capacity can be relocated from one geographic region to another to respond to service demand.[169] While a particular satellite-delivered service may be technically available in any particular nation, the laws and regulations of individual nations will determine whether the service may be commercially offered.[170] These policies may be specific to the satellite communications services sector or more generally applied to the entire communications sector, or even represent conditions applied to a broad scope of commercial activities. Such policies may, by their nature, affect the ability of individual firms to enter the market.[171]

119. In directing the Commission to prepare this Report, Congress requested that the Commission compile "a list of any foreign nations in which legal or regulatory practices restrict access to the market for satellite services in such nation in a manner that undermines competition or favors a particular competitor or set of competitors."[172] As directed to by Congress, we have requested comment on "the legal or regulatory practices of foreign nations which have the effect

(Continued from previous page)
Ruling to Add HISPASAT-1D Satellite at 30° W.L. to the Permitted Space Station List, File NO. SAT-PDR-20030430-00090, Order, 18 FCC Rcd 21142 (2003).

[164] *See Horizons Satellite LLC, Petition for Declaratory Ruling to Add Horizons I to the Permitted Space Station List*, File No. SAT-PDR-20030210-00015, Order, 18 FCC Rcd 24745 (2003); *Horizons Satellite LLC, Application for Modification of Permitted List Authorization*, File No. SAT-PPL-20040112-00004, Order and Authorization, 19 FCC Rcd 20349 (2004) (permitting one-way DTH service).

[165] *See Mabuhay Philippines Satellite Corp. Petition for Declaratory Ruling, et al*., Order and Authorization, 15 FCC Rcd 23671 (2000).

[166] *See Binariang Satellite Systems SDN BHD, Petition for Declaratory Ruling to Add MEASAT-2 to the Permitted Space Station List*, File No. SAT-PDR-20030501-00091, Order, 18 FCC Rcd 16623 (2003).

[167] *See Loral SpaceCom Corporation, Petition for Declaratory Ruling to Add Telstar 13 to the Permitted Space Station List*, File No. SAT-PDR-20020315-00025, Order, 18 FCC Rcd 16374 (2003). Intelsat acquired Telstar 13 from Loral Spacecom Corporation in 2004, and operates it as IA-13. *Loral Satellite, Inc, and Loral Spacecom Corp., Assignors and Intelsat North America, LLC, Assignee,* Order and Authorization, 19 FCC Rcd 2404 (2004).

[168] SIA Comments at 6-7 (*quoting* FCC, 2004 Section 43.82 Circuit Status Data, at 4 n.12 (Dec. 2005)).

[169] *Id.* at 7.

[170] *See, e.g.,* International Telecommunication Union, ITU-D Study Group 1, Rapporteur For Question 17/1, Satellite Regulation In Developing Countries, *Report on Satellite Regulation In Developing Countries* (2004) ("*ITU-D Satellite Regulation Report*") at 7-8.

[171] The United States Trade Representative (USTR) explains that "[t]rade barriers or other trade distorting practices affect U.S. exports to another country because these measures effectively impose costs on such exports that are not imposed on goods produced domestically in the importing country." 2006 NTE Report, Foreword.

[172] 47 U.S.C. § 47 U.S.C. § 703(b)(3).

of restricting access to that nation's market for satellite services." We also asked commenters to tell us "what types of legal or regulatory practices hinder U.S. firms from fully participating in a given foreign market" and if there are "legal or regulatory practices that favor a particular competitor or set of competitors."[173]

a. Executive Branch

120. The Commission is an independent regulatory agency tasked primarily with implementation of the Communications Act. As such its expertise is related primarily to regulation of domestic communications services or international communications that originate or terminate in the United States. Moreover, the Commission does not represent the United States government in its formal relations with other sovereign nations, although it does provide assistance in areas of its expertise.

121. Any review of the legal or regulatory practices of a foreign nation raises issues intimately related to the trade relationships of the United States with other sovereign nations. Foreign relations, including communications-related agreements, are the province of Executive Branch agencies. It is beyond the role of the Commission to determine whether foreign nations' laws and regulations are or are not in compliance with any obligations under trade agreements with the United States or other international law. The discussion in this Section (and Appendix B), therefore, does not represent the views of the Executive Branch.

b. Market Access Standard

122. In carrying out Congress' direction to identify those nations with legal or regulatory practices that restrict access to their markets for satellite services, we first must determine what standard we will apply to describe which practices do in fact restrict access for satellite services "in a manner that undermines competition or favors a particular competitor or set of competitors."[174]

123. In the Notice, we invited comment on this issue. Three parties filed comments that addressed this Section of the report. In implementing Congress' direction, we also look to the United States' rules for reviewing entry to the U.S. market to evaluate whether or not legal or regulatory practices in other nations restrict access to foreign markets in a manner that undermines competition or favors a particular competitor or set of competitors.[175]

(i) Comments

124. SIA filed comments describing the practices that they assert non-WTO Member nations should adhere to in order to gain accession to the WTO or that current WTO Member nations should adopt if they have not yet done so. SIA recommends that the Commission consider whether a nation (1) provides for transparent, non-discriminatory and timely licensing procedures; (2) provides for national treatment (*i.e.*, most favored nation status); and (3) permits the transport of broadcast video signals and associated audio signals. SIA also recommends that the Commission ensure that a nation does not require as a prerequisite to entry (4) local presence;

[173] *Notice* at 5.

[174] 47 U.S.C. § 703(b)(3).

[175] *See supra* § III.E.5.

(5) completion of the International Telecommunications Union ("ITU") frequency coordination process; or (6) the deployment of any particular technology. In addition, SIA also states that (7) no special monopoly status should be afforded to incumbent telecommunications operators or satellite systems.[176]

125. In its comments, Stratos Global Corporation ("Stratos") asserts that while seeking regulatory approval to provide Inmarsat's mobile satellite services it has encountered barriers "in many, if not a majority of the world's countries."[177] Stratos states that many countries continue to protect the monopoly operations of incumbent providers and prevent competitive entry either through legal and regulatory practices that have that effect or through the lack of an applicable regulatory scheme.[178] Stratos asserts that many countries do not permit competitors to sell MSS services or impose local ownership requirements and/or exorbitant licensing fees.[179]

126. Finally, EchoStar commented that Canada has imposed legal and regulatory barriers to entry into the Canadian satellite television market that include foreign ownership restrictions, rules controlling the amount of U.S. and Canadian content carried on Canadian satellites and restrictions on the distribution of U.S. content to Canadian consumers.[180]

127. We also reviewed USTR's National Trade Estimate Report on Foreign Trade Barriers ("NTE Report"), which documents foreign trade and investment barriers and U.S. efforts to reduce and eliminate those barriers.[181]

128. The NTE Report covers significant trade barriers whether they are consistent or inconsistent with international trading rules.[182] The NTE considers trade barriers to include "government laws, regulations, policies, or practices that either protect domestic products from foreign competition or artificially stimulate exports of particular domestic products."[183] In the 2006 NTE Report, a number of foreign nations are cited for several types of market barriers to

[176] SIA Comments, Att. 1 at 3-4.

[177] Stratos Comments at 1.

[178] *Id.* at 2.

[179] *Id*. at 2-3.

[180] EchoStar Comments at 6.

[181] USTR is required to submit an annual report on significant foreign trade barriers to the President, the Senate Finance Committee, and appropriate committees in the House of Representatives in accordance with section 181 of the Trade Act of 1974, as amended by section 303 of the Trade and Tariff Act of 1984, section 1304 of the Omnibus Trade and Competitiveness Act of 1988, section 311 of the Uruguay Round Trade Agreements Act, and section 1202 of the Internet Tax Freedom Act. The NTE Report is based upon information compiled within USTR, the U.S. Departments of Commerce and Agriculture, and other U.S. Government agencies, and supplemented with information provided in response to a notice in the Federal Register, and by members of the private sector trade advisory committees and U.S. Embassies abroad. 2006 National Trade Estimate Report on Foreign Trade Barriers ("*2006 NTE Report*"), Foreword.

[182] Many barriers to U.S. exports are consistent with existing international trade agreements. On the other hand, where measures are not consistent with international rules, they are actionable under U.S. trade law and through the World Trade Organization. *2006 NTE Report*, Foreword.

[183] *Id*.

satellite, including (1) a lack of commitments in trade agreements for market access or national treatment for satellite services; (2) requirements for foreign operators to partner with local entities or otherwise establish a local presence; (3) restrictions on DTH or other satellite-delivered content business; and (4) restrictions on foreign ownership in satellite operators or related businesses.

(ii) Discussion

129. We find that the Commission's rules for foreign-licensed satellite providers to operate in the United States provide a reasonable benchmark for evaluating whether foreign nations' requirements for entry into their satellite markets have the effect of restricting access to that nation's market for satellite services. The Commission's rules incorporate both the commitments made by the United States as a part of its WTO membership and a process for evaluating entry by non-WTO Member nations. Although the United States does evaluate non-WTO Member nations (and all foreign nations with regards to non-WTO-covered services) for equivalent competitive opportunities for entry for U.S. operators, the United States' baseline requirements for foreign entry to the United States' satellite markets do not restrict or preclude meaningful participation by foreign operators nor do our rules favor a particular competitor or set of competitors.[184]

c. Market Access Findings

130. In this proceeding, we did not receive extensive comment regarding foreign market barriers to U.S. licensed satellite operators. We did receive illustrative information regarding the types of barriers satellite companies assert exist in various foreign nations from SIA (a U.S.-based trade association representing satellite operators, service providers, manufacturers, launch services providers, remote sensing operators and ground equipment suppliers). SIA asserts that its Comments provide an "industry-wide consensus perspective on certain selected issues raised by the Public Notice."[185] In addition, Stratos described legal and regulatory obstacles encountered by mobile satellite service providers when seeking to enter foreign markets, and EchoStar described specific restrictions on the provisions of DBS services to Canada. We find these comments expressed several common categories of legal or regulatory policies that restrict access to foreign markets. We received no comments in opposition to these comments. Moreover, we find that the comments are not in conflict with stated approaches to market access issues for satellite services by USTR or the Commission. We find, therefore, that these general observations regarding foreign nations' market barriers are consistent with the standard for review of foreign satellite markets we have chosen to use in this Report.

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[184] With regards to non-WTO Members and non-WTO-covered services, only if the United States finds that a foreign nation's requirements do not provide to U.S. operators equivalent competitive opportunities to the baseline U.S. market requirements, does the United States restrict entry by foreign satellite operators.

[185] SIA Comments at 1. SIA lists as executive members: Artel, Inc., The Boeing Company, The DirecTV Group, Globalstar LLC, Hughes Network Systems LLC, ICO Global Communications, Integral Systems, Inc., Intelsat, Ltd., Iridium Satellite LLC, Lockheed Martin Corp. Loral Space and Communications Inc., Mobile Satellite Ventures LP, Northrop Grumman Corp., PanAmSat Corp., SES Americom, Inc., and TerreStar Networks, Inc., and as associate members: ATK, Inc, EMC Inc, Eutelsat, Inc, Inmarsat plc., IOT Systems, Marshall Communications Corp., New Skies Satellites Inc., Spacecom Corp., and Stratos Global Corp. *Id.* at n.2.

131. Based on our standard and the record in this proceeding, we identify six broad types of market barriers established by foreign nations that preclude entry by U.S. satellite operators or satellite service providers.[186] Some barriers relate generally to the commercial or procedural conduct of countries' regulatory regimes, such as: a lack of transparent, non-discriminatory and timely licensing procedures; and no national treatment *(i.e.*, Most Favored Nation status) provided for U.S. satellite operators. Other barriers relate to legal or regulatory practices that are specific to satellite services, such as: prohibitions on U.S. satellite operators transporting broadcast video signals and associated audio signals; requirements that U.S. satellite operators establish a local presence or obtain a local partner; requirements for completion of the ITU frequency coordination process prior to granting market access for U.S. satellite operators; and explicit monopolies for a country's domestic satellite operator over a U.S. operator. Appendix B to this Report includes a list of the nations commenters identified in the record as engaging in one or more of the following market barriers to entry by U.S. satellite providers.

132. Lack of Transparent, Non-Discriminatory and Timely Licensing Procedures . SIA asserts that licensing procedures should be streamlined, transparent, and timely, and recommends that licensing procedures should be the same for satellite earth stations, mobile satellite handsets and all terminal equipment accessing domestic or foreign satellite systems.[187] Stratos states that even where application by competing providers is permitted, some countries impose exorbitant licensing fees.[188]

133. No National Treatment (*i.e.,* Most Favored Nation Status) for United States Satellite Operators. SIA asserts that foreign nations should not make exemptions to or otherwise place limitations on Most Favored Nation treatment that would put U.S. satellite operators at a disadvantage.[189] In the 2006 NTE, USTR noted those foreign nations that took exemptions for market access or national treatment for satellite services under the WTO or another trade agreement.[190]

134. Prohibitions on U.S. Satellite Operators Transporting Broadcast Video Signals and Associated Audio Signals. SIA asserts that foreign nations should permit U.S. satellite operators to transmit video programming and any associated audio signals.[191] EchoStar notes that Canada has imposed several barriers to entry into its satellite television market that include restrictions on foreign ownership and content as well as rules limiting the use of Canadian

[186] NTE groups trade barriers into ten different categories: (1) Import policies; (2) Standards, testing, labeling and certification; (3) Government procurement; (4) Export subsidies; (5) Lack of intellectual property protection; (6) Services barriers; (7) Investment barriers; (8) Anticompetitive practices; (9) Trade restrictions affecting electronic commerce; and (10) Other barriers. *2006 NTE Report*, Foreword.

[187] SIA Comments, App. A at 3.

[188] Stratos Comments at 3.

[189] SIA Comments, App. A at 3.

[190] USTR noted that both the Philippines and Columbia had not made commitments for various satellite services under the WTO. *2006 NTE Report* at 173, 531.

[191] SIA Comments, App. A at 4.

satellites.[192] In the 2006 NTE, USTR noted those foreign nations that impose restrictions on satellite-delivered content businesses.[193]

135. Requirements for Local Presence or a Local Partner. SIA notes that a foreign satellite operator is not required to establish a local company or presence in the United States in order to be added to the Permitted Space Station List. SIA and Stratos assert that foreign nations similarly should not impose local requirements on U.S. satellite operators.[194] In the 2006 NTE, USTR noted those foreign nations that require U.S. satellite operators to partner with local entities or otherwise establish a local presence.[195]

136. Requirements for Completion of the ITU Frequency Coordination Process Prior to Granting Market Access. SIA notes that the United States does not require an applicant to complete international coordination before granting that applicant's satellite system authorization. Rather, the authorization is conditioned with a requirement to undertake ITU coordination.[196] If a satellite operator has received a license for its space segment from its home country and has coordinated through the ITU, a foreign nation should not impose a duplicate licensing requirement to provide services in that country.[197]

137. Monopolies for Domestic Satellite Operators or Service Providers. SIA asserts that foreign nations must not afford any special monopoly status to incumbent telecommunications operators or satellite systems. Foreign nations must permit U.S. satellite operators to sell space segment capacity directly to any licensed earth station operator.[198]

F. Effect of Technology Change on Market Structure

138. Technology innovation plays a critical role in the state of competition within specialized telecommunications industries such as the commercial satellite communications sector. Advances in spacecraft technology, associated ground equipment, or in satellite services applications can dramatically affect the competitiveness of satellite as a delivery platform versus other wired or wireless platforms, and the strategic competitiveness of one firm versus another within the satellite industry. Additionally, technological changes can permit the market entry of new service providers utilizing different technology platforms, such as satellite.

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[192] EchoStar Comments at 5-6.

[193] USTR cited Brazil for subjecting foreign satellite television programmers to an 11 percent remittance tax unless the programmer invests 3 percent of its remittances into co-production of Brazilian audio-visual services. *2006 NTE Report* at 45. USTR cited Singapore for restricting the use of satellite receiving dishes and has not authorized direct to user satellite television services. *Id*. at 602. USTR cited Canada and Korea for restricting the retransmission of foreign programming. *Id*. at 76, 408.

[194] SIA Comments at 3 and Stratos Comments at 3-4, Appendix A. *See also ITU-D Satellite Regulation Report* at 20, 67.

[195] USTR noted that India requires foreign satellite operators to have an Indian partner and that Russia requires foreign satellite operators to have a local presence. *2006 NTE Report* at 325, 559. In addition, the Russian Federation maintains a preference for the use of Russian satellite communications systems. *Id*. at 557.

[196] SIA Comments, Appendix A at 3.

[197] *See ITU-D Satellite Regulation Report* at 20, 67.

[198] SIA Comments, Appendix A at 4. *See also* Stratos Comments at 3.

1. Spectrum-Efficient Technology

139. Recent technology advances – in particular spot beam technology and powerful data compression algorithms – have enabled more efficient use of spectrum, thereby increasing the number of satellite providers that may effectively participate in a given market. Spot beams are small-footprint satellite beams that are focused on relatively limited portions of the Earth, thereby allowing multiple frequency reuse through spatial isolation (multiple beams).[199] Initially, spot beams were used to conserve on-board power while serving areas outside the main-beam (*e.g.*, the waters around Hawaii). More recently, spot beam technology in combination with advanced on-board, or ground-based, processing has permitted satellites to migrate to all-spot beam architectures. This design permits efficient reuse of spectrum and allows for the delivery of regional services.

140. Data compression is the process of encoding data to reduce redundancy, thus increasing effective data density and reducing required transmission bandwidth. Data compression is accomplished by providing a coding scheme at each end of a communications link that allows characters to be removed at the transmitting end of the link, and replaced at the receiving end. Data compression techniques continue to yield higher data rate services within a given bandwidth.[200]

141. Some other significant examples of increased technical efficiency in satellite communications include: error detection/correction coding[201] and higher-order modulation techniques (*e.g.*, 8PSK,[202] 16-QAM[203]) permitting significant increases in data rates within a given spectrum bandwidth (higher bit/s/Hz); and demand assignment[204] techniques that maximize the number of satellite users that can access a given resource.

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[199] Typically, 20-30 Ku-band spot beams are used to provide coverage of the entire USA. At Ka-band, spot beam diameters may be small and capable of tighter targeting of designated metropolitan areas. *See, e.g.,* Fred Dawson, "Next Generation FSS May Prove Formidable," CED (May 1, 1997), available at http://www.cedmagazine.com /article/ca6261705.html (visited Nov. 1, 2006); Jeffrey Krauss, "Sorting Out The Satellite Confusion," CED (July 1, 1997), available at http://www.cedmagazine.com/article/ca6261652.html (visited Nov. 7, 2006).

[200] *See* Owen D. Kurtin, "Dollars & Sense: A Closer Look: DVB And IPTV," Satellite Today (July 1, 2006), available at http://www.satellitetoday.com/cgi/pub/via/via07010607.html (visited Nov. 7, 2006).

[201] In error detection and correction coding, each data signal conforms to specific rules of construction (code) so that departures from this construction in the received signal can generally be automatically detected and/or corrected.

[202] Phase-shift keying ("PSK") is a digital modulation scheme that conveys information by changing, or modulating, the phase of the reference carrier wave. In 8-PSK, eight distinct phases are used, each corresponding to a unique pattern of binary data bits.

[203] Quadrature amplitude modulation ("QAM") is a modulation scheme which conveys information by changing the amplitude of two carrier waves that are out of phase with each other by 90°. In 16-QAM, sixteen discrete modulation symbols are represented by various combinations of the relative amplitudes of each of the two quadrature waves.

[204] Demand assignment refers to the assignment of varying amounts of capacity to particular users depending upon their fluctuating traffic requirements. When multiple users share a communication channel on a real-time basis, demand assignment optimizes channel capacity utilization at the expense of system complexity.

2. On-Board Processing

142. On-board processing is a general term that refers to signal processing functions implemented on-board the satellite that go beyond the amplification and frequency conversion performed in conventional, bent-pipe satellite systems, to include any number of additional functions like demodulation, multiplexing, switching or routing. On-board processing payloads can function as intelligent signal routers and switches, directing traffic between spot beams in a satellite or to another satellite within the operating constellation. This capability enables wide regional or even global single-hop connectivity between earth stations. Moreover, they are able to adapt quickly to changing data throughput and system loading demands. On-board processing systems can achieve the higher service speed, throughput capacity and full-mesh connectivity necessary for peer-to-peer communications. In addition, low-Earth orbit ("LEO") systems require sophisticated position and pointing capabilities, satellite-to-satellite handover control, and beam-to-beam handover control functions which may also be performed on-board.

143. Despite its many advantages, on-board processing is not achieved without significant increases in satellite payload cost and complexity. Moreover, because on-board processed systems are generally tailored to a specific application, they are less able to adapt to changes in the operator's business model.

IV. MARKET CONDUCT

144. In this Section, we explore a variety of factors that may influence firm conduct and decision-making in satellite communications markets. Because fixed and sunk costs are a prominent attribute throughout the satellite industry, we explore the types of economic costs evident in both wholesale and retail markets. We also contrast the means by which prices are set in both the wholesale and retail markets, and the extent to which firms compete in price alone or on both price and product quality.[205]

145. In general, we find differing conduct in the wholesale and retail satellite markets. For wholesale markets, firms tend to invest heavily in the network costs of acquiring the satellite-based infrastructure required to enter the communications satellite market. As a result, carriers competing in wholesale markets generally compete on the basis of price. For retail markets, firms tend to invest more in marketing, additional programming, and other operational costs to increase the consumer's willingness to pay for the firm's output compared to what is offered by competitors.

A. Wholesale Markets

146. In wholesale satellite communications markets, the conduct of market participants is significantly influenced by non-discretionary investments required to build a satellite-based infrastructure or procure satellite transponder capacity. These economic costs, which may be broadly categorized using the accounting terms as "network costs," include the investment in engineering, design and manufacture of spacecraft, launch vehicle services, transponder lease

[205] For further discussion, *see* John Sutton, *Sunk Costs and Market Structure: Price Competition, Advertising, and the Evolution of Concentration* (Cambridge, MA; MIT Press, 1991).

contracts, network control and ground support services.[206] These costs tend to be determined by technology and are essential to market entry; in economic terms, they are considered "sunk" costs that are not easily be transferred.[207]

147. For wholesale markets, these non-discretionary "network" costs tend to exceed other discretionary investments, such as the "operating costs" of advertising or marketing expenditures that are more prevalent in retail markets.[208] Unlike satellite carriers delivering retail services directly to customers, wholesale satellite carriers face a relatively small number of specialized buyers whose needs and demands remain relatively consistent. Further, the negotiated, long-term contract nature of exchange transactions in this market tends not to require investment in a substantial base of customer support functions, product advertising, and mass marketing.

148. Table 6 sheds some light on the relative ratio of network costs versus operating costs, using publicly available company financial data for 2001-2005. Not all data are available for all satellite operators, but sufficient data do exist to allow computation of rough proxies for economic costs using network and operating sunk costs. We note that the data utilized in this Table pre-dated the subsequent mergers of Intelsat with PanAmSat and SES with New Skies.

[206] We note that accounting costs are not strictly equivalent to economic costs. Accounting costs are historical, where economic costs are future-oriented, reflecting the opportunity cost of using an input of production, such as labor, materials, or durable assets in a particular application.

[207] These 'sunk' costs are predominately 'fixed' costs. Network costs tend to be totally fixed in that they do not vary with output, while the operating costs are largely fixed in nature, but may vary to some extent with the level of production, *i.e.*, programming expenditure.

[208] Operating costs or expenses are accounting costs related to the production of goods or services sold, such as R&D and sales and marketing; see G. Porter and C. Norton, *Financial Accounting*, Second Edition (Dryden Press, 1995), 560-61.

TABLE 6

RATIO OF OPERATING TO NETWORK SUNK COSTS

FOR WHOLESALE SATELLITE OPERATORS[209]

Satellite Carrier	Estimated Replacement Cost of Satellites ($ millions)	Weighted Average Cost of Capital @8.5% Per Annum ($ millions)	Depreciation@ 8.3% Per Annum ($ millions)	Estimated Network Cost[210] ($ millions)	Ratio of Operating to Network Costs[211]
Intelsat	8,400.0	714.0	840.0	1,554.0	0.098
PanAmSat	3,300.0	280.5	330.0	610.5	0.184
SES	8,472.0	720.1	847.2	1,567.3	N/A
New Skies	N/A	N/A	N/A	N/A	N/A

Source: Company Annual Reports.[212]

149. For wholesale markets, the Table shows that network costs dominate the cost structure.

150. Price Competition. Wholesale satellite markets reveal a pricing behavior that primarily reflects bilateral negotiations or bargaining between the customers and satellite carriers. Given the highly specific circumstances surrounding any particular negotiation between a satellite carrier and a wholesale customer, it is difficult to model general bargaining behavior in

[209] Operating expenses are taken from income statements of satellite operators, and a weighted average cost of capital and an annual depreciation rate are applied to the estimated replacement value of an operator's satellite fleet to estimate annual platform cost. This estimated cost is a proxy for the single-period, implicit annual economic rental cost of such assets.

[210] Estimated Network Costs were based upon the replacement value of the satellite fleet as of 12/31/2005 multiplied by a weighted average cost of capital of 8.5%, the average for the DTH firms as estimated by Bernstein, and an average depreciation rate based on a 12 year design life.

[211] Discretionary costs in the numerator were calculated using sales, marketing, R&D, and programming costs contained in publicly-filed reports for relevant companies.

[212] Intelsat, Ltd., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at http://www.sec.gov/edgar.shtml (visited July 12, 2006); PanAmSat Holding Corp., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at http://www.sec.gov/edgar.shtml (visited July 12, 2006); SES, Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at http://www.sec.gov/edgar.shtml (visited July 12, 2006); New Skies Satellites B.V., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at http://www.sec.gov/edgar.shtml (visited July 12, 2006).

a way that is representative of behavior for all satellite carriers and all wholesale customers.[213] It is possible, however, to identify certain attributes of the bargaining environment that are predictive of the conduct of both satellite carriers and wholesale customers.[214]

151. Negotiations between a satellite carrier and a wholesale customer are multidimensional and often include much more than just the pricing of transponder lease services. As we have discussed, specific technical aspects of coverage, power, and bandwidth likely come into play. Negotiations may also involve the terms and conditions of the transponder lease contract, including payment schedules, cancellation penalties, and legal issues, and other aspects of service delivery, including the nature and extent of customer support following contract execution. Both parties benefit from building and sustaining a workable, ongoing, and long-term commercial relationship, given the typical length of contract term for most transponder leases and the technical nature of the service, which may require adjustments and modifications as technology and the commercial requirement evolve.[215]

152. The negotiated pricing of a transponder generally reflects relative bargaining power which is affected the customers' ability to select outside options, *i.e.*, other offers of service or economic benefit outside the current bargaining context that party may accept if negotiations in the present bargaining context breakdown. The price may also reflect the certain economic attributes of transponder transactions including asset specificity, *i.e.*, the degree that an asset can redeployed to alternative uses and by alternative users without substantial loss in productive service.

153. The bargaining power of the customer with credible outside options may constrain the satellite carrier from realizing much or any economic profit. Customers without credible outside options may still retain substantial bargaining power relative to the satellite carrier. To the extent that a satellite carrier has substantial excess transponder capacity or faces a highly uncertain demand for its services, then the satellite carrier may be willing to accept an offer that fails to cover its long run incremental cost.

154. The limited transponder lease rate data that exist for wholesale markets support our previous discussion of the prominence of investments in network versus operating costs.[216] As indicated above, the wholesale market for transponder capacity is characterized by bilateral

[213] Possibly the most useful general bargaining models for understanding in broad terms satellite carrier and wholesale customer behavior are found in the literature on alternating offers over finite and infinite time. *See*, Areal Rubinstein, "Perfect Equilibrium in a Bargaining Model," *Econometrica* 50 (1982): 97-110. A useful treatise covering numerous aspects of modern bargaining theory is Abhinay Muthoo, *Bargaining Theory With Applications* (Cambridge, UK: Cambridge University Press, 1999).

[214] This discussion addresses the major long-term contractual issues that are most directly related to investment decisions. We note that there may be other markets in which the dynamics of negotiation may differ somewhat, such as the spot market for transponder capacity for satellite news gathering, which relates to short-run needs of customers.

[215] As emphasized in transaction cost economics, such contracts are necessarily *incomplete,* and an adaptable mechanism is required to allow the resolution of new problems or disputes which may arise during execution of the contract. *See* Oliver E. Williamson, *The Economic Institutions of Capitalism* (New York: The Free Press, 1985), Chapter 2.

[216] *See supra* at ¶ 146-147.

negotiations between suppliers and customers. Asset specificity, combined with the bargaining power of purchasers (which reflects outside options), should be reflected in price differentials.

155. Table 7 presents the average lease rate per 36 MHz transponder, by region, for the years 2003 and 2004, in a way that permits examination of site specificity. The Table also reflects the regional excess supply of transponders for 2005, as those lease rates would reflect supply and demand considerations for the near future. With the exception of the Middle East and North Africa and somewhat with Latin America,[217] there is a high degree of correlation between excess supply and lease rates, indicating that the volume of outside options has a strong influence on market prices.

[217] It should be recalled that there are a number of other factors besides outside options that will affect price.

TABLE 7

TRANSPONDER LEASE RATES AND EXCESS SUPPLY OF TRANSPONDERS

Region	2003/2004 Average Revenue/Transponder in Millions of $	Excess Supply/Total Supply (2005)
Western Europe	3.02	30.7 %
Asia Pacific	1.51	46.4 %
North America	1.49	47.1 %
Sub Saharan Africa	1.37	53.5 %
Middle East and North Africa	1.41	28.3 %
Latin America	1.36	38.8 %
Central Europe	1.40	52.0 %
Russia and Central Asia	1.31	52.6 %
Southern Asia	0.87	55.7 %

Source: *Euroconsult 2006 Report*.

B. Retail Markets

156. For retail markets with many customers, short term financial arrangements, and high customer mobility, substantial investments in advertising and programming are required to create and support a brand image and to enhance the customer's perception of value and willingness to pay for the product. Extensive customer support capability to retain and attract customers is also needed in such markets. These expenditures are both discretionary and significant in the retail markets.

157. Table 8 shows the proportion of network to operating investments for satellite carriers supplying the retail SDARS market, applying the same assumptions for estimating economic costs described above for wholesale markets. This Table relies on publicly filed company data for 2001-2005. The high level of operating to network costs is consistent with substantial investments spent on product development and customer acquisition.

TABLE 8

RATIO OF OPERATING TO NETWORK SUNK COSTS

FOR SDARS OPERATORS

Satellite Carrier	Estimated Replacement Cost of Satellites ($ millions)	WACC @8.5% Per Annum ($ millions)	Depreciation @ 8.3% Per Annum ($ millions)	Estimated Network Cost[218] ($ millions)	Ratio of Operating to Network Costs[219]
XM	1,040.0	88.4	104.0	192.4	3.1
Sirius	780.0	66.3	78.0	144.3	2.9

Source: Company Annual Reports.[220]

158. Price Competition. Table 9 indicates an increasing trend in average revenue per user or unit ("ARPU") for SDARS providers. This trend occurred simultaneously with the dramatic growth in subscribers as presented in paragraph 182 below.

TABLE 9

ARPU TREND FOR SDARS OPERATORS

ARPU	2001	2002	2003	2004	2005
XM	n/a	n/a	8.97	8.68	9.51
Sirius	n/a	n/a	9.48	10.16	10.34

Source: Company Annual Reports.[221]

V. MARKET PERFORMANCE

159. In the foregoing Sections, we have studied the structure of, and conduct in, the relevant markets for satellite communications services. In this Section, we apply those studies using publicly available industry data to evaluate how well these markets are performing for consumers. We discuss various tests that are commonly applied to evaluate market performance including the degree of competition and the presence of market power. The tests that we are able

[218] Based upon the replacement value of the satellite fleet as of December 31, 2005, multiplied by a weighted average cost of capital of 8.5%, the average for the DTH firms, as estimated by Bernstein, and an average depreciation rate based on a 12 year design life, as estimated by Futron Corp.

[219] Operating costs in the numerator were created using sales, marketing, R&D, and programming costs contained in publicly filed company reports.

[220] XM and Sirius 10-Ks.

[221] *Id.*

to apply, based on the available data, provide us with enough information to conclude generally that the markets analyzed are performing well, and that both wholesale and retail markets show evidence of price and quality rivalry.

A. Analytical Framework

160. Introduction. Good performance in a market is best described as an optimal mixture of efficiency in the use of resources, responsiveness to consumer demands, and innovation to produce improved services at lower prices.[222] One way to detect the presence or absence of these forms of 'good performance' in a market is to measure the presence of competition or, at the opposite extreme, market power. In a perfectly competitive market, no firm has the ability to charge prices above cost on a sustained basis and to earn ongoing 'economic' profits (revenues in excess of what is required to compensate all inputs of production for their opportunity costs). Such a market is likely to perform well for consumers. If, however, a firm can set its prices above its costs and earn economic profits for a sustained period of time, then the firm possesses market power.[223] Such a market is likely to perform poorly for consumers. Between these two extremes lie many possible levels of competition. For example, market power can exist in a relevant market and that market's performance may be sub-optimal relative to a theoretical benchmark of perfection, but 'effective competition' can be developing.[224]

161. Description of Economic Tests. In the following paragraphs, we discuss commonly used tests to measure both the degree of competition and the presence of market power. Some of these tests measure static conditions, such as the relationship between current prices and marginal costs. Other tests measure dynamic conditions, such as changes in market share, improvement in quality, and other indicators of innovation. Ultimately, we do not apply all of the tests to all the relevant markets, due in part to the unavailability of requisite data or the inappropriateness of some tests for certain types of markets.

162. Market Concentration. As described in Section III.D.2, a market's concentration can be measured by calculating market shares or by calculating the HHI.[225] As discussed in that Section, however, we do not find HHIs to be a meaningful indicator of competition in wholesale

[222] See F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Third Edition, Houghton Mifflin Co., Boston MA, 1990) 4-5.

[223] Market power sustained over a substantial period of time often signals the existence of some impediment to market entry, although the impediment need not constitute a policy-relevant barrier to entry. A policy-relevant barrier to entry (1) is any cost that a potential entrant must incur in the course of market entry that an incumbent firm need not incur, and (2) implies a net loss in consumer welfare if the barrier persists. *See Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming,* First Annual Report, 9 FCC Rcd 7442, 7542 n.532, ¶ 205 (1994).

[224] For example, the European Commission defines "effective competition" as a continuing absence of players with significant market power or a "dominant" position in the market. OECD, Working Party on Telecommunication and Information Services Policies, *Indicators for the Assessment of Telecommunications Competition* at 6 (Jan. 17, 2003), http://www.oecd.org/dataoecd/4/22/2496809.pdf#search=%22%22european%20commission%22%20%20%2B%20%22continuing%20absence%22%20%2B%20%22significant%20market%20power%22%22 (visited Sept. 13, 2006).

[225] *See supra* ¶¶ 69-71.

markets, but do apply it to retail markets. We assess concentration in wholesale markets by reviewing the percent of domestic transponder capacity in Table 10. We also calculate market shares and HHIs for SDARS in Table 13.

163. Profit-to-Sales Ratio. Another test of competition or market power in a relevant market is the ratio of profit over sales, either in one firm in the market or in all firms in the market. This test assumes that higher profits might indicate a level of market power in the relevant market. Some critics of this approach counter, however, that high profits may also result from remarkable innovation, superior service, governmental decisions, or historical accident. We use profit to sales ratios to measure competition in the wholesale market in Table 11.

164. The Lerner Index. Yet another test calculates the percentage difference between price and the marginal cost of production of a product or service at the profit-maximizing level of production.[226] The Lerner Index assumes that the prevalence over time of prices in excess of marginal costs often indicates the existence of market power.[227] If the Lerner Index of a market is declining, we may infer that the market is moving towards a competitive condition. In this Report, we use Lerner Indices to measure competition in the markets for wholesale services in Table 12.

165. The Lerner Index establishes a direct relationship between market power and the own-price elasticity of demand, or the degree to which the demand for a product itself changes as its price changes. If the elasticity of demand for a firm's product is infinite, as it is in a perfectly competitive market, then the deviation of price from marginal cost is zero. As illustrated by the Lerner Index, the larger in absolute value the own-price elasticity of demand is, the smaller the divergence is between monopoly and competitive price (where competitive price is just equal to marginal cost in the absence of economies of scale).[228] As the number of substitutes for a service increases, the elasticity of demand for its services will increase. Thus, even if competition in a market is between a few firms selling somewhat differentiated products, such rivalry may significantly increase the elasticity of demand for each of the rivals' services and eliminate significant deviations of price from marginal cost.

166. Consumer-Oriented Metrics. Competition and market power can also be detected indirectly in retail markets by calculating various metrics relating to consumer behavior, such as churn and ARPU. Churn is defined as the percentage of customers of a firm, or of all firms in a market, that change their service supplier in a given period of time. A low rate of churn in a market may indicate trapped customers and the presence of market power in one or more market participants. At the opposite extreme, a high rate of churn may indicate a competitive market in

[226] Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* 4th Int'l Ed. (Wesley, 2005) 137, 782*; see also id.* 195-96 (New York: Harper-Collins, 1994).

[227] The Lerner Index is defined as L = [(p - MC)/p] where p and MC measure the unit output price and the marginal cost of production, respectively.

[228] When measuring the extent of market power of a given firm, the market and the firm demand curves must be carefully distinguished. If the entire market is served by a single firm, *i.e.*, a monopoly, then the market demand curve is equivalent to the firm demand curve. Under perfect competition, each firm's demand curve is perfectly elastic and the market demand curve does not coincide with the firm demand curve.

which consumers freely shift from one supplier to another in response to lower prices, higher quantities, or other attractive attributes of service offerings.[229]

167. ARPU is another metric widely used in retail communications businesses. Falling ARPU can indicate decreases in price or increases in the quantity of service offered at a given price, either of which may indicate increasing competition or, at least, improved market performance for consumers. In this Report, we discuss ARPU, churn and other consumer-oriented metrics to measure competition in those retail markets where sufficient data exist.

B. Data and Application of Analytical Framework

1. Domestic Wholesale Markets

168. Publicly available data concerning the satellite industry necessary to conduct the analysis by the various metrics described in paragraphs 161-167 above, exist only in part. For wholesale satellite services markets, the available public data are quite limited, in part because some market participants report their financial data as part of a larger corporate parent's filings and do not provide sufficiently disaggregated data. Other wholesale market participants are not publicly traded, and no data are publicly reported. As noted in the description of the markets for the various wholesale services, these markets typically involve relatively few large purchasers of capacity. Because they can effectively bargain with satellite operators (unlike the large number of individual consumers in retail markets), measures of market concentration such as HHIs lose the meaning they might lend to retail markets. Additionally, the data available do not reflect the recent mergers of Intelsat with PanAmSat and New Skies with SES.

169. Many satellite operators are not, and have not been in recent years, publicly traded companies. Others do not disaggregate their financial data from that of their corporate parent company. This makes computation of comparable performance indices impossible. Several firms that operate global systems, essentially operators of fixed satellites, provide detailed financial data, but only on a consolidated, global basis, and not separately for the U.S. domestic market. As the domestic market, however, generally accounts for some 70% of global wholesale satellite revenues,[230] we have computed the various financial measures, understanding that these measures based on globally consolidated data can only serve as proxies for domestic data. In addition, a number of operators entered bankruptcy during the study period (with some exiting), particularly those in the mobile satellite services market, creating a high degree of fluctuation for some metrics.

170. For this Report therefore, we utilize data developed by the Futron Corporation for the capacity-related wholesale markets examined in this study. These data portray the use of transponders in the domestic market by the major operators prior to recent transactions, as well as some globally consolidated financial data that can serve as proxy indicators of competition in the domestic market. For the network services market, we provide industry revenue information to illustrate the dynamics of the VSAT and teleport sectors.

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[229] *See, e.g.*, *Motion of AT&T Corp. to Be Reclassified as a Non-Dominant Carrier,* Order, 11 FCC Rcd 3271, 3305-07, ¶¶ 63-66 (1995).

[230] *See* SIA/Futron Study at 8-11. An exception to this industry average is SES Americom, which does provide data. That data indicate, however, that its net income is 21% of that of SES Global.

171. Wholesale Market Shares. Given the cost characteristics and the dynamics of market demand, all wholesale market segments appear to be performing well. Our review of available data on shares of satellite capacity shows that four firms held 80 percent of the domestic transponders activated (Intelsat, SES Americom, PanAmSat and New Skies), with the remainder provided by Loral Skynet and other foreign-licensed operators. Subsequent to the collection of these data, Intelsat and PanAmSat merged, and SES and New Skies merged. We find relatively high profitability ratios for the major wholesale market participants but limited and declining market power based on Lerner Index proxy measurements. This may be due to the wholesale customer's strong bargaining power in establishing price and ongoing price rivalry among the remaining firms in the wholesale market, as well as terrestrial competition in certain wholesale markets. We also note that participants in the Network Services markets continue to post significant revenues, even as they are experiencing increased competition from terrestrial providers where wireline solutions are geographically available.

172. As noted in paragraph 71 above, the use of an HHI in markets in which there are few, large purchasers is of limited value due to the countervailing power between supplier and purchaser. Table 10 displays the major participants' shares of transponders activated in domestic markets.

TABLE 10

PERCENT OF DOMESTIC TRANSPONDERS

ACTIVATED BY FIXED SATELLITE OPERATORS[231]

	TV Relay (Video Contribution and Distribution)		MVPD		Network Services (VSATs)	
	2001	2006	2001	2006	2001	2006
Intelsat	5%	15%	0%	0%	9%	42%
PanAmSat	33%	29%	0%	0%	10%	13%
Loral	23%	3%	0%	0%	25%	3%
SES Americom (GE Americom)	33%	34%	0%	14%	37%	25%
New Skies	N/A	3%	N/A	0%	N/A	9%
Other	7%	15%	0%	0%	20%	9%
DirecTV (self-supplied)			67%	52.5%		
EchoStar (self-supplied)			33%	33.5%		
Note: Percentages reflect the operators' proportion of utilized capacity for each application.						

Source: Futron Corporation

173. Profitability Ratios and Lerner Indices for Wholesale Markets. Using information derived from the operators' globally consolidated financial statements, we can examine time series financial statistics for the four major operators that did not enter bankruptcy proceedings during the study period. Tables 11 and 12 below provide profitability ratios and Lerner Indices for these major wholesale service providers.[232]

[231] Data used in this table do not reflect the recent mergers of Intelsat with PanAmSat or New Skies with SES.

[232] Company price data necessary for a pure Lerner Index are not readily available. The Commission does not require prices for satellite communications services to be filed in tariffs; rather, wholesale prices are negotiated on a customer by customer basis and are not published. In most cases, it is also difficult to compute reliable estimates of marginal cost at the equilibrium level of output. As a proxy for pricing data, we rely upon the ratio of operating cash flow to sales, or of free cash flow (operating cash flow minus investment) to sales reported in individual company financial statements.

TABLE 11

PROFITABILITY RATIOS

FOR MAJOR WHOLESALE FIXED SATELITE OPERATORS[233]

Profit/Sales								
	2001	2002	2003	2004	2005	Average	Standard Deviation	St. Dev./ Average
PanAmSat[234]	0.0352	0.1047	0.1198	-0.0955	0.0845	0.1131	0.1005	0.8885
SES[235]	0.5360	0.3921	0.3078	0.3646	0.3782	0.3957	0.0746	0.1885
New Skies[236]	0.1584	-0.0234	0.0549	-0.0243	N/A	0.0414	0.0669	1.6159
Intelsat[237]	0.4603	0.2764	0.1914	-0.0371	-0.2777	0.12266	0.1959	1.5971

Source: Company Annual Reports.[238]

TABLE 12

PROXY LERNER INDICES

FOR MAJOR WHOLESALE FIXED SATELITE OPERATORS[239]

Lerner Index	2001	2002	2003	2004	2005	Average
PanAmSat	0.1629	0.2801	0.2926	0.1366	0.4203	0.2585
SES	0.6976	0.7795	0.7236	0.7658	0.5719	0.70768
Intelsat	0.4610	0.3218	0.2766	0.1403	0.0369	0.24732
New Skies	N/A	N/A	N/A	N/A	N/A	

Source: Company Annual Reports.[240]

174. As can be seen, earnings as measured by profitability ratios and Lerner indices in the wholesale markets are relatively high as compared to retail markets, but also highly variable. The level of earnings is consistent with customers' lack of significant 'outside options.' Further,

[233] Data used in this table do not reflect the recent mergers of Intelsat with PanAmSat or New Skies with SES.

[234] PanAmSat Corporation 10-Ks at 48.

[235] SES Annual Report at 87, available at http://www.ses-global.com/ses-global/site/Sections/mediaroom/publications/financial/index/php, (visited July 20, 2006).

[236] New Skies Satellites B.V., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("New Skies 10-Ks") at 34, available at http://www.sec.gov/edgar.shtml (visited July 11, 2006).

[237] Intelsat 10-Ks at 38.

[238] Intelsat, PanAmSat, SES and New Skies 10-Ks.

[239] Data used in this table do not reflect the recent mergers of Intelsat with PanAmSat or New Skies with SES.

[240] Intelsat, PanAmSat, SES and New Skies 10-Ks.

the general trend in these measures for the U.S. market is downward. Both the variability and downward trend in earnings are consistent with the earlier discussion of the bilateral negotiation nature of competition in the wholesale market. The downward trend in these metrics suggests an increase in rivalry for most wholesale services.

175. The degree of terrestrial competition faced by satellite providers varies significantly among wholesale markets. For Video Contribution and Distribution services, terrestrial alternatives have a limited competitive impact, because the economics of multi-point content distribution favor satellite technology, as does the inherently mobile nature of some Video Contribution activities. This may account for the relatively high values in the Tables above.

176. We note that the Lerner Index on its own may not be a reliable test of competition in markets with substantial capital or fixed costs and economies of scale such as satellite communications services markets.[241] Prices above marginal costs in such a market do not conclusively indicate market power because such prices may simply be necessary for a firm to cover its substantial capital or fixed costs.

a. Network Services

177. Little company-specific data are available for market participants in these wholesale markets, which includes the provision of satellite capacity for telecommunications backbone services, as well as satellite-based communications services using VSAT and teleport services. The allocation of satellite capacity for these services is indicated above in Table 10, revealing disparate emphasis among the major operators on this sector. The World Teleport Association estimates that the global teleport industry generated $12.8 billion at year-end 2004. Of this, the U.S. market generated $3.1 billion, representing a quarter of the world market.[242] The SIA/Futron Study estimates the U.S. VSAT industry generated $1.4 billion in revenues in 2005, double the sector's 2000 revenues.[243]

178. It is, however, clear that terrestrial competition is making inroads into what has been historically a market dominated by satellite. Increasingly, VSAT satellite operators are providing 'hybrid' networks to corporate customers that combine satellite and terrestrial components. This is particularly true for the corporate VSAT network sector, where both major market participants, Hughes and Gilat, offer such service.[244] Gilat includes a specific hybrid service, Connexstar DSL, in its service portfolio.[245]

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[241] Markets for satellite communications services are characterized by substantial fixed costs: more than $100,000,000 in capital to construct and launch a satellite, and the high cost of leasing transponders shown in Table 7 above.

[242] *Sizing the Teleport Market*, World Teleport Association (March 2005).

[243] *See* SIA/Futron Study at 11.

[244] A Hughes spokesman notes that 'we use the appropriate platform to meet the needs of our customers' and Gilat has formally teamed with Cisco for its VSAT Network Module. Jason Bates, *The Future of Private Networks: What Next for VSAT Systems*, Via Satellite (Aug. 2006).

[245] Spacenet's Portfolio of Services, available at http://www.spacenet.com/services/connexstar.asp (visited Aug. 9, 2006).

2. Domestic Retail Markets

179. For the SDARS market, we compute HHIs, both on the basis of revenues and subscribers, as well as the various financial measures. Because the fixed satellite broadband businesses are still developing, we lack adequate data to perform the metrics applied to the SDARS markets. For the nascent fixed satellite broadband market, we provide various consumer-oriented indices to illustrate their respective market dynamics.

a. SDARS

180. Although the SDARS market appears to be in the early stages of development, sufficient data exists to analyze the performance of the market. XM[246] had its first full commercial year in 2002, followed by Sirius[247] in 2003. As expected in a relatively new market, neither provider is currently profitable,[248] but growth rates for both subscribers and revenues are high and revenues per user have begun to rise.

181. HHI. For SDARS service providers, the HHI trend shows a decrease, reflecting intensifying rivalry among the providers in this market. Table 13 below indicates that the HHI as of 2005 reflected a 70/30 market share favoring XM, but it should be noted that in 2006, Sirius has exceeded XM in terms of new subscriber acquisition.

TABLE 13

MARKET SHARES AND HHIs FOR SDARS

	2001	2002	2003	2004	2005
Market Shares (revenue)					
XM	100.0000%	96.1641%	87.7003%	78.5240%	69.7387%
Sirius	0.0000%	3.8359%	12.2997%	21.4760%	30.2613%
HHI	10,000.00	9,262.25	7,842.63	6,627.24	5,779.23
XM		92.0587%	83.8979%	73.8527%	64.1434%
Sirius		7.9413%	16.1021%	26.1473%	35.8566%
HHI		8537.8684	7,298.14	6,137.91	5,400.07

Source: Company Annual Reports.[249]

182. Consumer-Oriented Measures. Revenue statistics for SDARS operators show a very high growth rate. Revenue for SDARS in 2002 was approximately $21 million, but the industry generated revenues of over $800 million in 2005. During this time period, ARPU has

[246] XM 10-Ks.

[247] Sirius 10-Ks.

[248] In fact, for the second quarter of 2006, XM's loss increased from $ 148 million in 2005 to $ 231 million, even though revenue nearly doubled over the same period. Sarah McBride, *XM Satellite Posts Wider Loss, Lowers Subscriber Targets*, Wall St. J. at A12 (July 28, 2006). Also, Sirius has reported a comparable loss of $238 million and is forecast to have continuing losses at least through 2008 by UBS Investment Research. UBS First Read, *Sirius Satellite* (July 6, 2006).

[249] XM and Sirius 10-Ks.

increased slowly. For example, Sirius' monthly charge rose from $9.48 in 2003 to $10.34 in 2005 while industry subscribers rose from 1.3 million in 2003 to 9.2 million in 2005.

b. Fixed Satellite Broadband Services

183. Two-way satellite-based fixed broadband service was first offered only in 2005, and satellite-based broadband of all types represents less that 1 percent of the U.S. broadband subscriber base. The sector does show growing subscriber up-take and increasing competition among three emerging providers.

184. WildBlue began to offer service in June 2005 on a Canadian-licensed Anik Ka-band satellite. The company's own satellite, WildBlue-1, was successfully launched in December 2006.[250] In addition, Hughes will provide limited HughesNet Ku-band service until the launch of the Ka-band satellite Spaceway 3, scheduled for 2007. These additional satellites will greatly expand satellite broadband capacity dedicated to the residential/SOHO market because all of WildBlue-1 and some portion of Spaceway will be dedicated to that market.

185. Table 14 provides a comparison of the current satellite-based market participants' offerings, indicating the similarity of each company's service offerings and prices charged, particularly for services targeted at residential/home office customers.

TABLE 14

SERVICE OFFERINGS AND PRICES CHARGED

BY SATELLITE-BASED BROADBAND PROVIDERS

WildBlue[251]				
	Downstream speed	0.5 Mbps	1.0 Mbps	1.5 Mbps
	Upstream speed	128 Kbps	200 Kbps	256 Kbps
	Upfront cost	$ 299	$ 299	$ 299
	Monthly price	$ 49.95	$ 69.95	$ 79.95
Hughes[252]				
	Downstream speed	0.5-0.7 Mbps	0.8 -1.0 Mbps	1.5 Mbps
	Upstream speed	N/A	N/A	N/A
	Upfront cost	$ 299.98	$ 299.98	$ 699.98
	Monthly price	$ 59.00	$ 69.00	$ 199.00
Starband[253]				

[250] Arianespace, *Mission Update,* http://www.arianespace.com/site/news/news_sub_missionupdate2_index.html (visited Dec. 29, 2006)

[251] WildBlue, *About Wildblue*, http://www.wildblue.com/aboutWildblue/vs_dial_up.jsp, and *Get WildBlue*, http://www.wildblue.com/getWildblue/doServiceAvailabilitySearchAction.do (both visited Oct. 31, 2006).

[252] *HughesNet Broadband Unbound* available at http://www.direcway/bz/orderhughesnet.html (visited Aug. 10, 2006).

	Downstream speed	Up to 10x faster than dialup	0.75 Mbps	Up to 20X faster than dialup
	Upstream speed	100 Kbps	128 Kbps	256 Kbps
	Upfront cost	$499.99	$ 599.99	$899.99
	Monthly price	$69.99	$109 .99	$149.99

186. Subscriber Levels. At the end of 2005, Hughes reported 275,000 total subscribers for North America, [254] which reflects its early entry into the market. Space News reports, however, that for the last six months of 2005 (the time in which WildBlue began commercial operation) Hughes and WildBlue each added approximately 25,000 customers.[255] By the end of the third quarter of 2006, Hughes reported that it had 313,000 subscribers,[256] up from 300,000 subscribers at the end of the second quarter (of which 250,000 were residential and 50,000 were business[257]) and WildBlue reported 85,000 customers.[258] Additionally Space News reports that Gilat Starband had 30,000 broadband subscribers in August 2006.[259] This indicates that satellite competition for broadband services has developed.

187. Due to the fledgling state of the satellite-based broadband market during the specified study period, no further detailed analysis is possible.

VI. COMPETITION ASSESSMENT AND CONCLUSIONS

188. In this Report, we find that markets for commercial communications satellite services are subject to effective competition and that consumers realize significant net benefits in terms of service choice, innovation, and improvements in service quality. Market performance measures indicate good market performance and support an expectation that such performance will be sustained in the coming year.

189. For wholesale markets, we observe that the lumpy nature of satellite infrastructure investment leads to recurring excesses of capacity, creating a certain degree of inherent but predictable, economic instability. Costs for wholesale markets are predominantly fixed and

(Continued from previous page)

[253] Starband, Starband Telecommuter available at http://www.starband.com/telecommuter/index.asp (visited Aug. 30, 2006).

[254] Hughes Commun., Inc. Overview, available at http://www.hughes.com (visited Aug. 10, 2006).

[255] Peter B. de Selding, *WildBlue On Par with DirecWay in New Customer Sign-ups,* Space News (Jan. 16, 2006), available at http://www.space.com/spacenews/archieve06/WildBlue_011606.html (visited Aug. 8, 2006).

[256] Spaceway, *Hughes Communications Inc. Announces Third Quarter 2006 Results,* http://www.spaceway.com/HUGHES/Doc/0/OVSTPRT5QUCKFDAQF7CSGLI16F/11-14-06_HCI_Q3_Earnings_Release_Final.pdf (visited December 29, 2006).

[257] The Bridge, *The Hughes Net Business Case*, Aug. 25, 2006.

[258] *Wildblue completes $350M Debt Funding Deal*, Communications Daily (Aug. 22, 2006).

[259] *Starband stabilizes under New Ownership*, Space News Business Report (Aug. 25, 2006).

centered around network-related costs, and there are relatively few buyers and sellers in the market. Pricing behavior in wholesale markets reflects in substantial part the relative bargaining power of the satellite carrier and the wholesale customer. In two wholesale markets, Video Contribution and Video Distribution, trends in major market performance indicators show that any ability by satellite providers to influence the markets is gradually eroding, despite the recent mergers of Intelsat and PanAmSat, and of SES and New Skies. We also note that the VSAT and teleport operators competing in the wholesale market for Network Services continue to post significant revenues, even as they face increasing competition from terrestrial alternatives.

190. In general, we observe that retail market participants invest relatively more in advertising and other quality-related expenditures directed toward product improvements than in network costs. Retail markets generally feature a relatively large number of buyers. Competition in the retail markets for SDARS is still emerging. Similarly, the fixed Wireless Broadband Service markets are in early stages, characterized by high subscriber growth rates and product innovation.

191. We observe significant improvements in market entry conditions in recent years. As a result of the *DISCO II Order* to implement the satellite market-opening commitments made by the United States in the WTO, the Commission has approved many foreign-licensed satellites to provide services within the United States. We also identify six broad legal and regulatory barriers established by foreign nations that affect foreign market entry by U.S. operators, and list those countries identified as exhibiting these barriers.

VII. PROCEDURAL MATTERS

192. This First Report is issued pursuant to authority contained in section 703, 47 U.S.C. § 703.

VIII. ORDERING CLAUSES

193. It is **ORDERED** that the Secretary shall send copies of this Report to the appropriate committees and subcommittees of the United States House of Representatives and the United States Senate.

194. It is **FURTHER ORDERED** that the proceeding in the IB Docket No. 06-67 IS **TERMINATED**.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

List of Parties Filing Comments and Other Papers

Comments
DIRECTV, Inc.
EchoStar Satellite, L.L.C.
Inmarsat plc
Mobile Satellite Ventures Subsidiary LLC
Stratos Global Corporation
The Satellite Industry Association

Reply Comments
EchoStar Satellite, L.L.C.
Inmarsat plc
Iridium Satellite, LLC

APPENDIX B

List of Foreign Nations Raising Barriers to Market Entry by United States Satellite Providers

This Appendix is a compilation of foreign nations identified in the record in this proceeding as having legal or regulatory practices that constitute market barriers for U.S. satellite companies.

Countries Identified as Lacking Transparent, Non-Discriminatory and Timely Licensing Procedures for U.S. Satellite Operators.

- Brazil
- China
- Egypt
- India
- Indonesia
- Russia

Countries Identified as Not Providing National Treatment (*i.e.*, Most Favored Nation status) for U.S. Satellite Operators.

- Brazil
- China
- India
- Indonesia
- Israel
- Kazakhstan
- Korea
- Malaysia
- Philippines
- Russia
- Saudi Arabia
- Vietnam
- Venezuela

Countries Identified as Not Permitting U.S. Satellite Operators to Transport Broadcast Video Signals and Associated Audio Signals.

- Canada
- India
- Kazakhstan
- Russia

Countries Identified as Requiring a Local Presence or Local Partner for U.S. Satellite Operators.

- Bangladesh
- Brazil
- Indonesia
- Israel
- Kazakhstan
- Mexico
- Philippines
- Russia
- Saudi Arabia
- Venezuela

Countries Identified as Requiring Completion of the ITU Frequency Coordination Process Prior to Market Access for U.S. Satellite Operators.

- Brazil
- Russia

Countries Identified as Having a Monopoly for the Domestic Satellite Operator.

- Egypt (duopoly)
- Indonesia
- Kazakhstan
- Russia
- South Africa
- Thailand
- Vietnam