

## Policy-Induced Competition: The Case of Cable TV Set-Top Boxes<sup>1</sup>

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1. Our title borrows from Gerald R. Faulhaber, *Policy-Induced Competition: The Telecommunications Experiments*, 15 INFO. ECON. & POL'Y 73 (2006). The authors thank Gary Arlen for an enlightening discussion on the topic of this paper.

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## I. INTRODUCTION

In January 2009, the Federal Communications Commission (FCC) released a 71-page glossy report entitled “Moving Forward: Driving Investment and Innovation While Protecting Consumers”<sup>2</sup> appraising Kevin Martin’s four years as chairman of the FCC.<sup>3</sup> The report makes the claim that, in 2007, the FCC acted to implement a competitive market for set-top boxes (STB), the in-home electronic devices that control customers’ cable TV connections.<sup>4</sup> As a result, “consumers may [now] purchase a box of their choice instead of having to lease equipment from their cable providers.”<sup>5</sup> The FCC sought to establish that its regulatory effort—which kicked off with mandates in the 1996 Telecommunications Act and has generated no fewer than 20 FCC notices and over 6,000 comments and replies<sup>6</sup>—has paid dividends, opening up valuable new choices for consumers.

In fact, the marketplace touted by regulators has failed to materialize: today virtually all households subscribing to cable

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2. FED. COMM’NS COMM’N, MOVING FORWARD: DRIVING INVESTMENT AND INNOVATION WHILE PROTECTING CONSUMERS (2009), [hereinafter MOVING FORWARD], available at <http://www.fcc.gov/fcc-moving-forward-report.pdf>.

3. Martin was the second of two FCC Chairs appointed by President George W. Bush. The first, Michael Powell, headed the Commission from 2001 to 2005. Martin’s tenure spanned 2005 to 2009. *Former FCC Chairman Kevin J. Martin: Biography*, FED. COMM. COMMISSION, <http://www.fcc.gov/commissioners/previous/martin/biography.html> (last updated Jan. 28, 2009); *Former FCC Chairman Michael K. Powell: Biography*, FED. COMM. COMMISSION, <http://www.fcc.gov/commissioners/previous/powell/biography.html> (last updated Mar. 18, 2005).

4. MOVING FORWARD, *supra* note 2, at 25.

5. *Id.*

6. *Electronic Comment Filing System*, FED. COMM. COMMISSION, <http://fjallfoss.fcc.gov/ecfs/proceeding/view?z=v0oml&name=97-80> (last visited Sept. 30, 2010).

TV rent STBs from their service provider.<sup>7</sup> The logic of the reforms was that subscribers, faced with a standalone (“unbundled”) STB choice, would head to Best Buy or Wal-Mart to buy better equipment from competing retail vendors.<sup>8</sup> Moreover, these competitive options would enable new content and applications to flow to the household, bypassing cable operator “gatekeepers.”<sup>9</sup> This rule would trigger an “evolution of the market for navigation devices so that they become generally and competitively available through commercial retail outlets.”<sup>10</sup> Yet, despite implementation of the FCC’s regulations, and self-congratulatory public statements, that market has not emerged.<sup>11</sup>

This failure is, in less glossy reports, the assessment of the FCC itself. In the Commission’s words, the CableCARD technology developed to facilitate modular conformity of competing devices has “failed to stimulate a competitive retail market for set-top boxes.”<sup>12</sup> The top two cable STB manufacturers in North America, Motorola and Cisco, both supply their STBs through cable providers and account for an estimated ninety-five percent of the units’ shipments over the first three quarters in 2009.<sup>13</sup> In contrast, “there are 0.5 million CableCARDS deployed in retail devices today, which represent approximately 1% of all set-top boxes deployed in cable homes.”<sup>14</sup> There are only two manufacturers, TiVo and Moxi, that “continue to sell CableCARD-enabled set-top boxes through retail outlets.”<sup>15</sup>

The experience of the FCC’s attempt to create a “policy-induced competition” is important on its own and for its more

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7. FED. COMM’NS COMM’N, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN 18 (2010), [hereinafter CONNECTING AMERICA], available at <http://download.broadband.gov/plan/national-broadband-plan.pdf>.

8. See *id.* at 50 (stating that congress added Section 629 to the Telecommunications Act of 1996 to stimulate competition in set-top boxes).

9. *Id.*

10. Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, First Report and Order, 13 FCC Rcd. 14775, at 14780, para. 13 (1998) [hereinafter Implementation].

11. CONNECTING AMERICA, *supra* note 7, at 18.

12. CONNECTING AMERICA, *supra* note 7, at 50. See also Nate Anderson, *FCC Admits CableCARD a Failure, Vows to Try Something Else*, ARS TECHNICA (Dec. 4, 2010, 11:38 AM), <http://arstechnica.com/tech-policy/news/2009/12/fcc-admits-cablecard-a-failure-vows-to-try-something-else.ars>.

13. CONNECTING AMERICA, *supra* note 7, at 50.

14. *Id.* at 51 (citation omitted).

15. *Id.*

general implications. In many services, particularly in telecommunications, regulators have sought to restrict vertical integration so as to leave complements free to compete. Classically, this was the approach in the old Bell System following the *Carterfone* mandate, which allowed non-AT&T equipment—notably, telephones and switches—to access standard interfaces as plug-in devices.<sup>16</sup> The result was that, even while phone networks maintained monopoly services for voice and data transport, competitive rivalry developed with respect to network-connected devices.<sup>17</sup>

Of course, the *regulated monopoly* featured in the old AT&T (“Ma Bell”) system yielded economic incentives distinct from those in other markets, posing challenges for regulators specific to the industry.<sup>18</sup> The Telecommunications Act of 1996 statutorily ended, for all practical purposes, regulation of cable TV rates.<sup>19</sup> The subscription video market has also become increasingly competitive as satellite and phone providers have emerged as direct rivals of cable companies, thereby limiting profit margins.<sup>20</sup> Moreover, whatever the gains from the expansion of equipment markets in the wake of *Carterfone*, competitive entry in telephones did not generally create competition for underlying network services.<sup>21</sup> That development had to wait for inter-modal competition offered by cable TV operators (for fixed services) and cellular networks (for fixed-to-mobile substitution).<sup>22</sup> That is a key fact, given that the incentive for an un-

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16. Use of the Carterfone Device in Message Toll Tel. Serv., 13 F.C.C. 2d 420, 420–421 (1968); Teferent Leasing Corp., 45 F.C.C. 2d 204, 205 (1974), *aff’d sub nom.* N.C. Util. Comm’n v. F.C.C., 537 F.2d 787 (4th Cir. 1976); Mebane Home Tele. Co., 53 F.C.C. 2d 473, 473–475 (1975), *aff’d sub nom.* Mebane Home Tele. Co. v. FCC, 535 F.2d 1324 (D.C. Cir. 1976).

17. Faulhaber, *supra* note 1, at 73, 79, 96.

18. See Marius Schwartz, *The Economic Logic for Conditioning Bell Entry into Long Distance on the Prior Opening of Local Markets*, 18 J. REG. ECON. 247, 261–266 (Nov. 2000) (explaining the incentives of entering the local and long distance phone markets).

19. John Allen Hendricks, *The Telecommunications Act of 1996: Its Impact on the Electronic Media of the 21st Century*, 21 COMM. & L. 39, 48 (1999). See also *General Cable Television Industry and Regulation Fact Sheet*, FED. COMM. COMMISSION (June 2000), <http://www.fcc.gov/mb/facts/csgen.html>.

20. Thomas Hazlett & Dennis Weisman, *Market Power in U.S. Broadband Services* 20–21 (George Mason Law & Econ. Research Paper No. 09-69, 2009), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1525568##](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1525568##).

21. See *id.*

22. Dan Brenner, *Creating Effective Broadband Network Regulation*, 62

regulated service provider to anti-competitively foreclose a vertical service rival focuses on protection of the underlying market.<sup>23</sup>

Despite these facts, as well as the distinctions of AT&T's regulated monopoly, suggestions have been made recently to impose vertical limits, à la *Carterfone*, in a variety of markets. These include a "Wireless *Carterfone*" by Tim Wu<sup>24</sup> and a proposal for extensive network sharing obligations on U.S. broadband providers in an FCC-commissioned study produced in 2009 by Harvard Law School's Berkman Center.<sup>25</sup> Given these policy arguments and others similar in nature, it is important to evaluate the evidence gleaned from instances in which regulators have already sought to impose such rules. STBs are one prime area not yet addressed in the academic literature.

This paper proceeds in the following way: In Section II, we discuss the general issue of vertical integration, considering the efficiency and foreclosure theories describing marketplace outcomes. In Section III we trace the path of FCC STB rules from 1996 through 2009. Section IV then evaluates this regulatory strategy. Section V presents evidence regarding the market results of the FCC STB rules and includes a historical account of the parallel evolution of satellite TV STBs, where an unbundled product market evolved into a vertically integrated structure due to market forces. A summary and conclusion is offered in Section VI.

## II. EFFECTS OF VERTICAL INTEGRATION

Section 629 (then section 304) of the Telecommunications Act was enacted to create a "proconsumer"<sup>26</sup> environment that

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FED. COMM. L. J. 13, 42–43 (2010).

23. See James C. Cooper, Luke M. Froeb, Dan O'Brien & Michael G. Vita, *Vertical Antitrust Policy as a Problem of Inference*, 23 INT'L J. INDUS. ORG. 639, 641 (2005) (suggesting that a vertically integrated market power capable of raising prices to un-integrated rivals would necessarily avoid double-markup distortions and thus increase consumer welfare).

24. Tim Wu, *Wireless Carterfone*, 1 INT'L J. COMM. 389, 391 (2007), <http://ijoc.org/ojs/index.php/ijoc/article/view/152/96>.

25. Berkman Ctr. for Internet & Soc'y, *Next Generation Connectivity: A Review of Broadband Internet Transitions, and Policy from Around the World* 83 (Oct. 2009) (unpublished report), *available at* [http://www.fcc.gov/stage/pdf/Berkman\\_Center\\_Broadband\\_Study\\_13Oct09.pdf](http://www.fcc.gov/stage/pdf/Berkman_Center_Broadband_Study_13Oct09.pdf).

26. 142 CONG. REC. 1170 (1996) (statement of Rep. Edward Markey); *Implementation of Section 304 of the Telecommunications Act of 1996, Petition for Rulemaking of Public Knowledge, et al*, 13 (2009) [hereinafter *Petition for Rulemaking*], *available at*

will be “designed to make cable equipment cheaper and easier to use for all consumers.”<sup>27</sup> In the legislators’ views, consumers were “tired of paying rent for cable converter boxes and struggling with multiple clickers for the TV set-top box and their video machines.”<sup>28</sup> We are now able, given enactment of this “proconsumer” policy, to evaluate its effectiveness.

#### A. FIRM BOUNDARIES

Bundling services, such as when cable STBs are rented as part of the cable TV service, is a form of vertical integration.<sup>29</sup> At a general level, vertical integration is ubiquitous and efficiency-enhancing.<sup>30</sup> Firms do not attempt to minimize the number of inputs that they own; rather, they optimize to reduce costs, mixing complementary assets within the firm.<sup>31</sup> Even the smallest restaurant or grocery store owns a considerable proportion of the resources it employs in providing retail services. Furthermore, as Steven Cheung has pointed out, the lines between what is internal and what is external to the firm become blurred by the use of contracts: when the restaurant pays the cook an hourly wage or a weekly salary, are the hours worked internal to the firm?<sup>32</sup> While the firm does not own the cook, it does claim rights to the labor produced by the cook. To that extent, the restaurant vertically integrates into cooking even as it contracts for labor inputs supplied by non-owners.

It is important to start at this basic level. Where vertical

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<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020354735>.

27. 142 CONG. REC. 2016 (1996) (statement of Sen. Patrick Leahy). See also Petition for Rulemaking, *supra* note 26.

28. 142 CONG. REC. 2016 (1996) (statement of Sen. Patrick Leahy).

29. Robert E. McCormick, William F. Shughart II & Robert D. Tollison, *A Theory of Commodity Bundling in Final Product Markets: Professor Hirshleifer Meets Professor Becker*, 26 INT’L REV L & ECON. 162, 164 (2006).

30. *Id.* at 163 (“Commodity bundling is pervasive. From a McDonald’s Happy Meal® to personal computers preloaded with an operating system, a web browser and a media player, consumers are confronted daily with take-it-or-leave-it offers requiring them to purchase bundles of products preassembled for them or nothing at all.”).

31. See Ronald H. Coase, *The Nature of the Firm*, 4 ECONOMICA 386, 391–392, 395 (1937) (suggesting that firms will naturally organize themselves to rely on transactions with other firms as little as possible to avoid contract costs, and expand vertically until it is no longer practical to do so). See also Steven Cheung, *The Contractual Nature of the Firm*, 26 J.L. & ECON. 1, 18 (1983) (expanding on Coase’s theory of the vertical expansion of firms).

32. Cheung, *supra* note 31, at 10–12, 17.

integration is seen, *ipso facto*, as evidence of anti-competitive conduct, general perspective has been lost.<sup>33</sup> In his initial formulation, Coase followed the intuition that companies produce internally when it is efficient to do so.<sup>34</sup> When inputs can be less expensively provided by outside suppliers, the firm will naturally seek to use the “price system” to purchase these products rather than supplying them internally.<sup>35</sup> Efficiencies of vertical integration are seized in the quest for competitive superiority.

Efficiencies can even be realized in situations where internal costs of production *equal* external supply costs by reducing transactions costs, including those emanating from double marginalization (effectively eliminating the exercise of market power by a supplier) or the cost of contracting.<sup>36</sup> The imperfection of contracts in aligning economic incentives may permit producers of complementary inputs to opportunistically hold-up their fellow suppliers in the production chain, appropriating rents.<sup>37</sup> Vertical integration is seen to remedy this problem, encouraging productive investments.<sup>38</sup> Alternatively, a firm may integrate to foreclose rivals, increasing profits via anticompetitive behavior. The strategy relies on creating barriers to entry (in either the upstream or downstream market) by increasing the scale and scope of new competitors.<sup>39</sup> In certain circumstances, this restricts output and raises quality-adjusted prices paid by consumers.<sup>40</sup> While early ACF theories were not well-formulated,<sup>41</sup> more recent analysis has offered profit-maximizing rationales.<sup>42</sup> Empirical research has not, however,

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33. Cooper et al., *supra* note 23, at 241 (demonstrating the fragility of using vertical integration to show anticompetitive equilibria).

34. Coase, *supra* note 31, at 395.

35. *Id.*

36. Cheung, *supra* note 31, at 4.

37. See, e.g., OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM 199–200 (1985) (giving petroleum suppliers and buyers as an example of suppliers charging entry fees and penalties to buyers in exchange for initial and continuing supply).

38. See *id.* at 88–89 (showing that as inter-firm relations approach vertical integration, hazards that lead to nonproduction are eliminated).

39. Cooper et al., *supra* note 23, at 642–43.

40. See *id.* at 648 (citing a study in which vertical integration in the cable industry raised consumer prices).

41. ROBERT BORK, THE ANTITRUST PARADOX 16 (1978).

42. See Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J.L. & TECH. 85, 103 (2003).

produced much evidence of anti-competitive vertical integration.<sup>43</sup>

#### B. EFFICIENCY V. FORECLOSURE

Despite this lack of evidence, vertical integration was historically viewed as suspicious by antitrust scholars who saw such forms of organization as motivated by the desire to create barriers to entry.<sup>44</sup> The idea was that, if a manufacturer bought a retail distributor, the services of the retailer were “foreclosed”—competing manufacturers would no longer be able to sell their products through stores now owned by its product rival.<sup>45</sup> Until the 1970s, the Supreme Court shared this perspective. In 1956 the Court struck down a vertical merger that was allegedly foreclosing a negligible percentage of the market.<sup>46</sup> In the 1961 case *Brown Shoe Co. v. United States*, the Court invalidated a vertical merger that allegedly foreclosed 5% and 1% of the respective market.<sup>47</sup> A decade later, *Ford Motor Co. v. United States* struck down a vertical merger involving 10% of the market.<sup>48</sup>

Starting in the 1970s a new understanding began to emerge.<sup>49</sup> Economists critically evaluated the theory on which vertical integration foreclosed competition, finding it arithmetically deficient.<sup>50</sup> Whatever existing retail capacity was captured by a manufacturer via merger would be offset by the retail capacity “opened” to rivals as the manufacturer shifted its sales to the integrated sales channel.<sup>51</sup> Moreover, the leveraging of

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43. See Cooper, et al., *supra* note 23, at 641 (suggesting that a vertically integrated market power capable of raising prices to unintegrated rivals would necessarily avoid double-markup distortions and thus increase consumer welfare).

44. See JOE BAIN, BARRIERS TO NEW COMPETITION 155–56 (1956) (arguing that there are few industries in which vertical integration would be necessary for legitimate cost-cutting purposes).

45. *Id.* at 16.

46. *United States v. E.I. du Pont de Nemours & Co.*, 353 U.S. 586, 593, 607–08 (1956).

47. *Brown Shoe Co. v. United States*, 370 U.S. 294, 343–44 (1961).

48. *Ford Motor Co. v. United States*, 405 U.S. 562, 578 (1971); *id.* at 589 (Berger, J., concurring in part, dissenting in part).

49. See Richard A. Posner, *The Chicago School of Antitrust Analysis*, 127 U. PA. L. REV. 925, 931–32 (1979) (suggesting that in the 1970s traditional industrial organization began to lose credibility).

50. *Id.* at 932.

51. *Id.* at 936.



market power, expanding monopoly upstream or downstream, was shown to be unconvincing.<sup>52</sup> In the standard case, there is only one monopoly profit per end product, and profits are maximized if complementary products are sold at *competitive* prices.<sup>53</sup> Efforts by a monopolist to vertically expand do not, in this case, increase monopoly power but lead to efficiencies—as the integration is undertaken to bring prices of complements (or inputs) to competitive levels.<sup>54</sup> As noted, some foreclosure possibilities remain, even if these are tied to pre-emption of horizontal rivalry—vertical integration serving as a means of raising rivals' costs.<sup>55</sup>

Economic studies strongly tend to support the proposition that vertical integration aids efficiency rather than foreclosure. As a comprehensive 2005 survey finds:

- Most studies find vertical integration precompetitive;
- Efficiency is often attributed to eliminating double-markups or cost savings;
- Studies find evidence consistent with “dealer services” efficiencies;
- It is difficult to find cases where vertical controls are unambiguously anticompetitive.<sup>56</sup>

#### C. VERTICAL RELATIONS IN THE MARKET FOR SET-TOP BOXES AND EFFICIENCIES DERIVED FROM INTERNALIZATION OF TRANSACTION COSTS

Some argue that cable companies leverage market power in video services to extract monopoly charges for STBs via monthly rental fees.<sup>57</sup> This leaves unexplained why cable operators do not simply extract such sums in cable service fees, which, given the operators' market power, can be set to include whatever surcharge would otherwise be imposed on STBs. In

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52. *See id.* at 935 (suggesting that the cost of expanding and maintaining monopolies vertically is greater than the costs of transacting with upstream and downstream monopolies).

53. *See id.* at 934 (introducing the Chicago analysis' belief that price discrimination by a monopoly will move output to competitive levels).

54. *Id.*

55. *See* Bain, *supra* note 44.

56. Cooper, et al., *supra* note 23, at 658.

57. Petition for Rulemaking, *supra* note 26, at 12–14 (arguing that consumers must rent set-top boxes for more than it would cost to buy them because of the monopoly cable companies hold in the set-top box market). *See also* CONNECTING AMERICA, *supra* note 7, at 50–51 (explaining the monopoly service providers have in set-top boxes).

short, if every subscriber needs a cable STB, then the cable monopolist does not obtain new market power by charging customers for the *bundle* (*service + set-top box*), as opposed to *service* alone. Indeed, the most likely explanation of STB fees is that they allow the cable operator to lower prices to price-elastic (perhaps low-income) customers who may restrict their TV viewing to one TV set (and STB), while charging less price-sensitive (presumably higher-income) households higher prices via multiple STB rentals.<sup>58</sup> This may be seen as a price discrimination scheme, but its effect is typically to increase output and reduce the inefficiency of whatever market power is enjoyed in the cable market.<sup>59</sup> Moreover, such pricing invigorates competitive entry; to the extent that new rivals can anticipate such marketing models, market forces supporting competitive entry are intensified.<sup>60</sup>

Questions are raised about why cable companies lease, rather than sell, STBs to customers.<sup>61</sup> Some view the practice as a way for the cable companies to obtain disproportionate returns from cable customers.<sup>62</sup> Yet, almost all other multichannel video programming distributions (MVPD), including direct-broadcast satellite (DBS) and Internet protocol television (IPTV) providers, rely on a similar business model.<sup>63</sup> The capital costs are absorbed by the network provider; subscribers pay monthly charges to amortize both these costs and general network overhead.<sup>64</sup> Competitive mobile phone providers also

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58. McCormick et al., *supra* note 29, at 177.

59. *Id.*

60. Posner, *supra* note 49, at 934.

61. 142 CONG. REC. 2016 (1996) (statement of Sen. Patrick Leahy). See also Petition for Rulemaking, *supra* note 26 (asking “that the Commission initiate a rulemaking to address the lack of competition in the video device market”).

62. *E.g.*, 142 CONG. REC. 2016 (1996) (statement of Sen. Patrick Leahy) (complaining that consumers have no choice but to pay for high-end equipment while actually receiving antiquated equipment).

63. *E.g.*, *English Packages*, DIRECTV, [http://www.directv.com/DTVAPP/new\\_customer/base\\_packages.jsp?](http://www.directv.com/DTVAPP/new_customer/base_packages.jsp) (last visited Sept. 30, 2010).

64. See *e.g.*, *AT&T U-verse Packages*, AT&T, <http://www.att.com/u-verse/shop/index.jsp?rel=nofollow&wtSlotClick=1-00477W!901481-1-1#fbid=a4UCh2JyDGc> (last visited Nov. 21, 2010); *Direct TV Prices*, DIRECTV, [http://www.directstartv.com/directv/directv\\_pricing.html](http://www.directstartv.com/directv/directv_pricing.html) (last visited Nov. 21, 2010); *Packages and Plans*, VERIZON, <http://www22.verizon.com/Residential/FiOSTV/Plans/Plans.htm> (last visited

structure network and handset capital costs largely the same way, with subscribers paying equipment costs in the form of monthly access fees and per-minute charges over the life of their contract.<sup>65</sup>

### III. FCC SET-TOP BOX REGULATIONS AND THE MVPD MARKET

#### A. CABLE SET-TOP BOXES AND THE ADVENT OF REGULATION

A set-top box is a device that connects a stream of video signals, in this case delivered via a cable or satellite television provider, to a subscriber's television set.<sup>66</sup> The box then controls channel selection, usually via a short-range wireless command sent by the viewer via a remote control device.<sup>67</sup> Most STBs used today also feature a "return path," meaning that, in addition to video content flowing from the cable TV head-end to the subscriber's household, the household can send signals to the head-end.<sup>68</sup> In the language of the 1996 Telecommunications Act, cable STBs are "navigation devices."<sup>69</sup>

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Nov. 21, 2010); *Satellite TV Program & Digital TV Packages*, DISH NETWORK, <http://www.dishnetwork.com/packages/programming/default.aspx> (last visited Nov. 21, 2010).

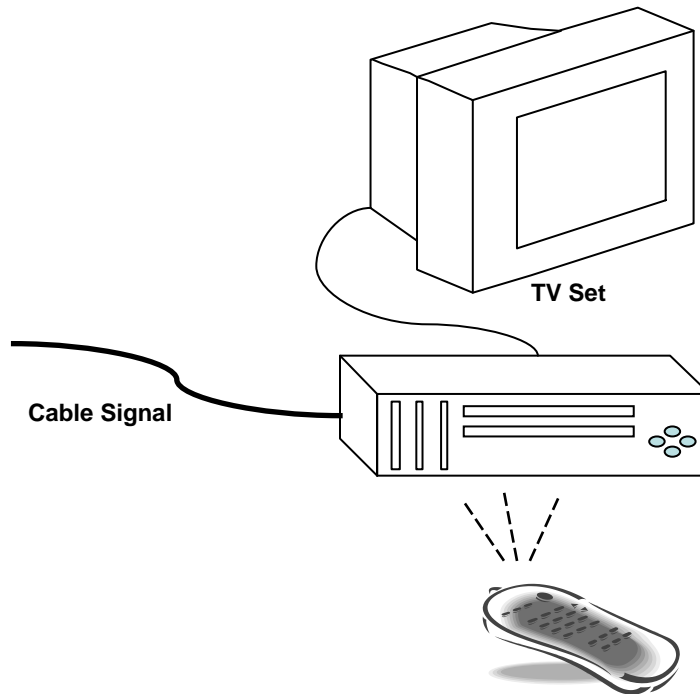
65. *E.g.*, *Family Share Plans*, VERIZON WIRELESS, <http://www.verizonwireless.com:80/b2c/splash/planfamily.jsp> (last visited Sept. 30, 2010).

66. *Set-Top Box*, WIKIPEDIA, [http://en.wikipedia.org/wiki/Set-top\\_box](http://en.wikipedia.org/wiki/Set-top_box) (last modified Sept. 16, 2010).

67. *Id.*

68. *Detailed Explanation of Set Top Boxes*, THE INTERACTIVE TELEVISION DICTIONARY AND BUSINESS INDEX, [http://www.itvdictionary.com/set-top\\_box.html](http://www.itvdictionary.com/set-top_box.html) (last visited Sept. 30, 2010).

69. FCC's use of the term "navigation devices" means converter boxes, interactive equipment, and other equipment used by consumers within their premises to receive multichannel video programming and other services offered over multichannel video programming systems. Implementation, *supra* note 10, at 14776 n.1.

**Exhibit 1. Use of a Cable Set-Top Box**

The Telecommunications Act of 1996 directed the FCC to

[A]dopt regulations to assure the commercial availability . . . of converter boxes, interactive communications equipment, and other equipment used by consumers to access multichannel video programming and other services offered over multichannel video programming systems, from manufacturers, retailers, and other vendors not affiliated with any multichannel video programming distributor.<sup>70</sup>

A primary obstacle to customer purchases of boxes supplied by third parties was in the security and authentication features of the box.<sup>71</sup> Cable TV systems are designed as “bus systems,”<sup>72</sup> meaning that all the video services supplied by the cable operator are loaded at the system head-end and carried everywhere with different services “disembarking” at those

70. 47 U.S.C. § 549 (2006).

71. Implementation, *supra* note 10, at 14776 para. 4.

72. Satellite systems are similarly designed, with the obvious difference that the “bus” is wireless.

points where paying customers are connected.<sup>73</sup> That is, all electronic content flows from the cable head-end on wires passing every customer's (and potential customer's) home; it then flows to individual household "drops" based on information as to which homes subscribe and what services they are entitled to receive.<sup>74</sup> This information is embedded in STBs. If subscribers are to buy these devices from companies other than the cable operator, there has to be some standard mechanism for inserting subscriber data into the equipment.<sup>75</sup>

In 1998, the FCC instituted an "integration ban" requiring MVPDs to separate their conditional access and security data from other functions in the STB, also known as a "host device."<sup>76</sup> The initial deadline was July 1, 2000.<sup>77</sup> This was intended to allow manufacturers and retailers to sell host devices to consumers while allowing MVPDs to maintain control over their content.<sup>78</sup> This policy was a form of structural separation, although cable operators would still be allowed to market STBs to customers as part of their video service.<sup>79</sup>

Subsequently, the FCC established January 1, 2005 as the new deadline for compliance with the integration ban.<sup>80</sup> The FCC extended this deadline to July 1, 2007 at the request of cable operators, allowing them additional time to determine the feasibility of developing a downloadable security function that would permit compliance with the Commission's rules.<sup>81</sup> Were such a software product to become available, it would presumably lower the costs of the integration ban relative to the alternative—using separate hardware devices (one for user authorization, one for channel selection).<sup>82</sup>

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73. *The Definition of Headend*, THE INTERACTIVE TELEVISION DICTIONARY AND BUSINESS INDEX, [http://www.itvdictionary.com/definitions/headend\\_head-end\\_head\\_end\\_definition.html](http://www.itvdictionary.com/definitions/headend_head-end_head_end_definition.html) (last visited Sept. 30, 2010).

74. *Id.*

75. *CableCARD*, WIKIPEDIA, [http://en.wikipedia.org/wiki/CableCARD#Technical\\_overview](http://en.wikipedia.org/wiki/CableCARD#Technical_overview) (last visited Sept. 30, 2010).

76. 63 F.R. 38089-01, 38090 (1998).

77. *Id.*

78. "No Commission action in this proceeding should be construed to authorize or justify any use, manufacture, or importation of equipment that would violate Section 633 of the Communications Act or any other provision of law precluding the unauthorized reception of MVPD service." *Id.*

79. *Id.*

80. Implementation, *supra* note 10, at 14803 para. 69.

81. 47 C.F.R. § 76.1204(a)(1) (2010).

82. Implementation of Section 304 of the Telecommunications Act of 1996,

In December 2002, the cable and consumer electronics industries adopted a memorandum of understanding (MOU) that reflected a compromise agreement to integrate the navigation functionality of STBs into television receivers as part of the digital television transition.<sup>83</sup> In January 2003, the FCC issued the *Further Notice of Proposed Rulemaking* (FNPR) seeking comments on the MOU and the proposed “plug and play”<sup>84</sup> cable compatibility standard. This standard would allow consumers to directly attach their “digital cable ready” television receivers to cable systems and receive one-way cable television services without the need for an external navigation device.<sup>85</sup> In April 2003, the FCC requested the cable and consumer electronics industries to provide status reports on their negotiations for bidirectional digital cable receivers and products at 90, 180, and 270 day intervals.<sup>86</sup> After the submission of the last status report to the Commission, the public was given 30 days to submit comments.

In October 2003, the FCC issued the *Second Report and Order and Second Further Notice of Proposed Rulemaking*, implementing the technical rules proposed as part of the MOU with some modifications.<sup>87</sup> In the follow-up *Report and Order* issued on March 17, 2005, the FCC investigated the state of the navigation device market and concluded that the state of the competition in the navigation devices market as of that date was not sufficient to assure the commercial availability of such devices.<sup>88</sup> The FCC cited contentions from Motorola and Scien-

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Commercial Availability of Navigation Devices, Second Report and Order, 20 FCC Rcd. 6794, 6810 para. 31 (2005) [hereinafter Implementation 2].

83. See Letter from Carl E. Vogel, President and CEO, Charter Commc'ns, et al., to Michael K. Powell, Chairman, FCC (Dec. 19, 2002), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6513399175>.

84. The FCC's proposed “plug and play” rules were aiming to allow consumers to receive cable programming without the need of a STB. Implementation 2, *supra* note 82, at 6797 para. 9. Hence, the cable would plug directly into the TV set without need for a STB.

85. *Id.*

86. Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd. 7924, at 7926 para. 5 (2003).

87. Implementation of Section 304 of the Telecommunications Act of 1996: Commercial Availability of Navigation Devices, Second Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd. 20885, at 20891 para. 10 (2003).

88. Implementation 2, *supra* note 82, at 6794 para 2.

tific Atlanta that they had attempted to negotiate deals with retailers to purchase and market STBs but received little to no retailer interest.<sup>89</sup> The Consumer Electronics Retailers Coalition (CERC), a trade group representing retailers, argued that even were STBs independently retailed, MVPDs would place obstacles in the path of competitive entrants.<sup>90</sup>

The FCC continued to press the integration ban. The cable industry challenged this policy in three separate petitions to the D.C. Circuit Court of Appeals, each of which was denied.<sup>91</sup> In limited circumstances, cable operators are eligible for waivers, to be granted where the FCC finds it “necessary to assist the development or introduction of a new or improved multi-channel video programming or other service offered over multi-channel video programming systems, technology, or products.”<sup>92</sup>

In March 2005, the FCC stated that it would consider requests for waiver of the prohibition on integrated devices for limited capability integrated digital cable boxes only. Requests for such waivers were to include full specifications of the device.<sup>93</sup> The grant of these waivers has caused a significant debate in the past several years as some claim that it impedes the purpose of Section 629.<sup>94</sup>

In March 2010, the FCC released a National Broadband Plan (NBP), which discusses difficulties in implementing the CableCARD standard.<sup>95</sup> In April 2010, the FCC then issued a notice of inquiry (NOI) seeking comments on specific steps the FCC can take to “unleash competition in the retail market for smart, STB devices that are compatible with all multichannel video programming distributor services.”<sup>96</sup> In addition, the FCC

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89. *Id.* at 6799 para. 14.

90. *Id.*

91. *See* Comcast Corp. v. FCC, 526 F.3d 763 (D.C. Cir. 2008); Charter Comm., Inc. v. FCC, 460 F.3d 31 (D.C. Cir. 2006); General Instrument Corp. v. FCC, 213 F.3d 724 (D.C. Cir. 2000).

92. 47 C.F.R. § 76.1207 (2009).

93. *See* Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Order on Reconsideration, 14 FCC Rcd. 7596, 7603 para. 15 (1999).

94. *See* Petition for Rulemaking, *supra* note 26, at 28.

95. *See* CONNECTING AMERICA, *supra* note 7, at 50–52.

96. *See* Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Notice of Inquiry, CS Docket No. 97-80 (Apr. 21, 2010), *available at* [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-10-60A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-60A1.pdf).

issued a *Further Notice of Proposed Rulemaking* where it proposes new rules for the CableCARD regime in the interim “until the successor solution becomes effective.”<sup>97</sup> It seems apparent that the FCC will be concerned with creating and enforcing STB rules for years to come. Appendix 1 outlines the chronology of STB proceedings to date.

There have been over 30 FCC Notices and more than 6,000 filings in the STB rulemaking.<sup>98</sup> Two sides in the proceeding may be said to be largely represented by the Consumer Electronics Association (CEA),<sup>99</sup> pushing regulators to create rules enabling a retail market in STBs, and the National Cable and Telecommunications Association (NCTA),<sup>100</sup> opposing such regulatory efforts.

#### B. CABLECARD AND ITS EFFECTS ON THE MARKET

By July 1, 2007, cable providers were ordered to begin separating the security and access features of their STBs. The first CableCARD device became available from third party manufacturers in August 2004. The CableCARD is a plug-in module (similar in appearance to a credit card) that allows consumers to access, view, and record digital cable TV channels without the use of an STB. Customers obtain CableCARDS by subscribing to a cable provider. They may then insert the card into their TV (assuming the TV has a slot for the card), an STB, a personal video recorder, or other electronic device. The card “unlocks” the channels and services to which the cable customer has subscribed.

The CableCARD standard was developed by CableLabs, a research consortium modeled on the old Bell Labs, but owned by the leading cable TV companies. Host devices that use CableCARDS must be certified as compliant by CableLabs. Cable companies, in turn, make their networks compatible with Cab-

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97. Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Fourth Further Notice of Proposed Rulemaking, CS Docket No. 97-80 (Apr. 21, 2010), available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-10-61A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-61A1.pdf).

98. *Electronic Comment Filing System*, FED. COMM. COMMISSION, <http://fjallfoss.fcc.gov/ecfs/proceeding/view?z=v0oml&name=97-80> (last visited Oct. 11, 2010).

99. Members of Consumer Electronics Association (CEA) manufacture consumer electronics.

100. Members of National Cable and Telecommunications Association (NCTA) manufacture cable TV systems.



leCARDS and host devices certified by CableLabs.<sup>101</sup> Such stand-alone devices, however, lack many functionalities of the traditional cable STB, including video-on-demand, subscriber guides, and other interactive features. As of June 2009, 29 vendors had 600 unidirectional digital cable-ready models (such as Digital Cable Ready DTV sets) approved for use with CableCARD,<sup>102</sup> as well as eight thru2way devices.<sup>103</sup> Actually selling and deploying such devices, so as to create a new third-party market, is quite another matter, as discussed in the Empirical Evidence section below.

#### IV. POLICY-INDUCED COMPETITION

##### A. FAULHABER'S FRAMEWORK

Gerald Faulhaber has examined a range of important cases in which policy makers have sought to open telecommunications markets to competition.<sup>104</sup> He focuses on policy interventions that require regulators to police the standards or terms used for market access, much as has been done in the FCC's implementation of CableCARD. The traditional rationale, dating to *Carterfone*, is to competitively discipline a service market monopolist in its primary market or in markets for complements. The problem is that, for rivalry that does not entirely displace the incumbent in the underlying service market, entrants will be forced to deal ("interconnect" in telecommunications jargon) with the service provider they seek to compete with. Examining the record, Faulhaber concludes that such rules may be successful in nurturing competition if either one of two conditions are met:

1. The market boundary is simple to define and easy to monitor;

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101. Chris Kohler, *CableCard Swipes at Set-Top Boxes*, WIRED (Aug. 30, 2006), <http://www.wired.com/science/discoveries/news/2006/08/71682>.

102. CABLELABS CERTIFICATION AND QUALIFICATION, <http://www.cablelabs.com/certqual/> (last visited May 27, 2010).

103. The tru2way® brand is the cable industry's common software platform for two-way digital TV devices. It establishes a common software platform that enables cable companies, content developers, network programmers, consumer electronics companies, and others to extend interactivity to the television set and many other devices. See *Brand Guidelines*, THRU2WAY (Feb. 27, 2008), [http://www.tru2way.com/downloads/tru2way\\_PrelimGuidelines.pdf](http://www.tru2way.com/downloads/tru2way_PrelimGuidelines.pdf).

104. See Faulhaber, *supra* note 1, at 73-97.

2. The monopolist is enjoined from operating in the newly competitive market.<sup>105</sup>

Faulhaber applies this hypothesis to the FCC's adoption of policies designed to induce competition into the customer premises equipment (CPE) market of direct concern in *Carterfone*. These policies allowed new entrants to enter monopolized segments of a sector where the basic service (local telephone service) would remain monopolized after the entry occurred. To induce competition, FCC policies had to specify and police the technical interface between different parts of the Bell System, specifically designing a modular plug-in layer where non-Bell phone equipment could interconnect to access the network.

The government is here trying to take certain functions outside the firm, for competitive reasons, tempering the vertical integration of an established service provider. This effort can be examined through the lens of the theory of the firm,<sup>106</sup> which suggests that the following transactions are most efficiently done within the firm:

- Those that involve long-term assets;
- Those that have significant information requirements; and
- Those requiring complex and ongoing coordination.<sup>107</sup>

The FCC's CPE policy was to move an important boundary between complements outside of the Bell monopoly; the regulated interface would make it difficult for the firm to not cooperate with independent rivals (CPE vendors) without depreciating the value of its own system (and its revenues). This approach ultimately proved successful.<sup>108</sup> The border between the network and the CPE had already been largely defined by Bell engineers and was not difficult to describe or police. The cost of compliance with the standards was relatively low. Competition was, therefore, invigorated in the ancillary (equipment, not service) market.<sup>109</sup>

The CPE example shares structural similarity with the

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105. *Id.* at 77.

106. *Id.*

107. *Id.* at 78.

108. See generally Amendment of Section 64.702 of the Commission's Rules and Regulations, 77 F.C.C. 2d 384, 447 (1980). See also *Customer Premises Equipment*, CYBERTELECOM, <http://www.cybertelecom.org/ci/cpe.htm> (last visited Oct. 31, 2010).

109. See Faulhaber, *supra* note 1, at 78.

cable STB effort. Both concern efforts to introduce equipment competition by imposing a regulated interface between devices and a communications network. The economic facts differ widely, however. First, there is no monopoly today in cable analogous to that existing in the Bell System. While cable operators demonstrated substantial market power in the 1980s and 1990s, competitive entry by satellite operators and telephone carriers have forced cable systems to compete across three retail services—video, voice, and data. The upshot is that above-competitive profits, apparent two decades ago, have disappeared when the market valuations of cable (or telephone carrier rivals) are examined.<sup>110</sup>

Second, the cable network is not price-regulated. This is key because when a network operates under rate of return regulation, it has an economic interest in pushing profits into an ancillary (unregulated) market as AT&T did.<sup>111</sup> Cable TV systems were price-regulated under the 1992 Cable Act, but these controls were lifted by statute in the Telecommunications Act of 1996.<sup>112</sup> Hence, guarding against cross-subsidy incentives disappears as a rationale for regulation.

Third, the CableCARD interface is not the simple, efficient border found between the telephone network and a registered jack, but a complicated, dynamically evolving commercial product. There are over 1,000 cable providers. These firms use many different technologies or architectures to offer a wide array of different services (such as HD, DVR, 3-D and interactive services and applications).<sup>113</sup> Cable operators do not own STB suppliers, companies such as Motorola, Cisco, Thomson, Samsung, Panasonic, Pace, and TiVo, but must cooperate with them

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110. Hazlett & Weisman, *supra* note 20.

111. This served as the rationale for line of business restrictions, in fact, keeping the post-divestiture Regional Bell Operating Companies out of equipment, long distance, and information services markets. See Timothy Brennan & Karen Palmer, *Comparing the Costs and Benefits of Diversification by Regulated Firms*, 6 J. REG. ECON. 115, 115–36 (1994).

112. See THOMAS W. HAZLETT & MATTHEW L. SPITZER, PUBLIC POLICY TOWARD CABLE TELEVISION: THE ECONOMICS OF RATE CONTROLS 140–41 (1997).

113. See *Industry Data*, NCTA, <http://www.ncta.com/Statistics.aspx> (last visited Oct. 11, 2010). There are five major cable companies and many smaller ones. See *Residential Voice, Data, and Video Services Market Highlights*, INFONETICS RESEARCH, <http://www.infonetics.com/pr/2009/Residential-Voice-Data-Video-Services-Market-Highlights.asp> (last visited Oct. 12, 2010) (noting that “the market is dominated by AT&T, Verizon, and Comcast in the US and Bell Canada and Rogers in Canada”).

in the production of complementary services even as these box makers simultaneously cooperate with cable's rivals (satellite and telco TV operators).

In contrast, the Bell System was a uniform entity operating under AT&T's standards, one of which had already defined the plug interface between telephones and the network. AT&T itself supplied CPE to end users via a wholly-owned subsidiary, Western Electric,<sup>114</sup> and created standards for both network and CPE design via another subsidiary, Bell Labs. While regulators allowed the Bell System to continue selling CPE equipment in competition with independent vendors, the market boundary was simple and easily policed. Faulhaber, following the conventional wisdom, finds that the regulation was successful.<sup>115</sup>

Despite private sector investment that may run into the billions of dollars to develop CableCARD and to make the associated cable TV network upgrades,<sup>116</sup> the retail market for STBs remains nascent. As in the telephone CPE structure, cable operators are not enjoined from operating in the market and continue to purchase STBs from suppliers, reselling them in service bundles. While it appears clear that imposing line-of-business restrictions to eliminate this integration (boxes and services) would prove highly disruptive (presumably the rationale for the FCC avoiding this path), it also leaves either of the (separately) necessary pre-conditions for successful policy-induced competition unmet. So far, the empirical result is consistent with the theory.

#### B. THE NATIONAL BROADBAND PLAN AND NEW DEVELOPMENTS IN THE REGULATION OF NAVIGATION DEVICES

The FCC's National Broadband Plan, some 376 pages in length, was released in March 2010.<sup>117</sup> Among the many policy questions analyzed, the plan discusses the CableCARD proceeding in some detail. It documents that the effort to develop a

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114. *Western Electric*, WIKIPEDIA, [http://en.wikipedia.org/wiki/Western\\_Electric](http://en.wikipedia.org/wiki/Western_Electric) (last modified Sept. 27, 2010).

115. See Faulhaber, *supra* note 1, at 79.

116. See Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Comments of National Cable and Telecommunications Association on NBP Public Notice #27, CS Docket No. 97-80 (Dec. 22, 2009).

117. CONNECTING AMERICA, *supra* note 7, at 50–52.

robust retail marketplace for STBs has proven a failure.<sup>118</sup> It notes that the top two cable STB manufacturers, Motorola and Cisco, together captured a 95 percent share of unit shipments over the first three quarters of 2009. That is up from 87 percent in 2006. The NBP contrasted the cable STBs retail market to the robust competition in wireless handsets, stating that while only 11 STBs have been certified for retail sale, more than 850 unique handsets were certified to operate on U.S. mobile networks in 2009 alone.<sup>119</sup>

The fact that the FCC finds the mobile handsets market highly competitive is itself an important data point. First, similarly to the cable STB market, the market for mobile phones features active involvement by service providers. Most handsets (like STBs) are purchased in service bundles offered by networks. Due to competition in services and technologies, wireless networks offer distinct handset choices; in some instances, makes or models are exclusive to a particular network. Customers therefore tend to select services and handsets as a combination, even when the items are sold separately. But they are typically sold in bundles. Most mobile providers offer a free mobile telephone when a client signs a contract (usually 2-year) with them.<sup>120</sup> Similarly, most cable STB customers lease their equipment from the cable provider.<sup>121</sup>

Ironically, while noting that CableCARD has failed to achieve its policy goal, the NBP recommends that the FCC proceed to ensure that *all* MVPDs (not just cable operators) install a CableCARD-type gateway device. This extends the failed policy, mandating “openness” in devices even for emerging competitors attempting to take market share from cable TV incumbents. The new goal would start to replace STBs in non-cable MVPD homes starting before January 1, 2013.<sup>122</sup>

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118. *Id.* at 50.

119. *Id.* at 18.

120. See, e.g., *Free Phones Cell Phone Sales*, AT&T, <http://www.wireless.att.com/cell-phone-service/cell-phone-sales/promotion/free-phones.jsp> (last visited Jan. 22, 2011); *Online Exclusive! Free Phones*, VERIZON, <http://www.verizonwireless.com/b2c/promo/splash/ewp?v=16> (last visited Jan. 22, 2011); *View Our Free Cell Phone Deals*, T-MOBILE, <http://www.t-mobile.com/shop/phones/?priceRange=0-0> (last visited Jan. 22, 2011).

121. See CONNECTING AMERICA, *supra* note 7, at 18.

122. *Id.* at 51.

## V. EMPIRICAL EVIDENCE

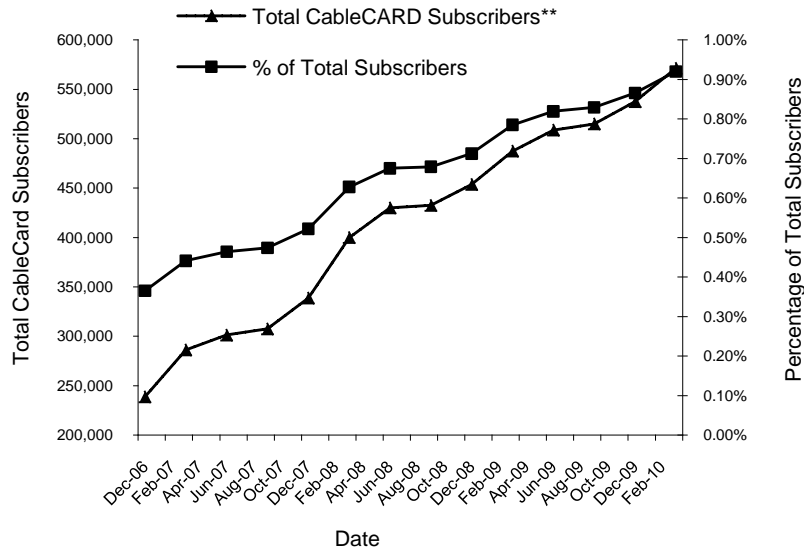
## A. FAILURE OF SET-TOP BOX RULES TO CREATE A NEW MARKET

Despite the FCC's 14-year regulatory effort to make STBs available through retail stores such as Best Buy or Wal-Mart, the vast majority of cable navigation devices are yet supplied by video service providers as part of standard service bundles.<sup>123</sup> Counting only those CableCARD-enabled boxes purchased or leased since the "integration ban" kicked in on July 1, 2007, some 19,532,000 were supplied to household subscribers by cable TV operators, as against 489,000 purchased from retail outlets.<sup>124</sup> Furthermore, given that before the "integration ban" all STBs were without the mandated interface, the actual universe of cable operator-supplied boxes is much larger—about 61.6 million households. In addition, as Figure 1 demonstrates, the percentage of CableCARD subscribers has remained below 1 percent of the total cable subscriber base.

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123. See, e.g., Motorola, Inc. Annual Report, 9 (Feb. 26, 2010), available at [http://files.shareholder.com/downloads/ABEA-2FO3VV/914904892x0x351222/A609D0EB-D868-4605-A227-D190A0BE17B4/2009\\_Motorola\\_10K\\_Final\\_clean\\_no\\_banners\\_.pdf](http://files.shareholder.com/downloads/ABEA-2FO3VV/914904892x0x351222/A609D0EB-D868-4605-A227-D190A0BE17B4/2009_Motorola_10K_Final_clean_no_banners_.pdf).

124. These data are for the top ten U.S. cable operators, by subscriber size. They count sales through February or early March, 2010 (depending on operator) as reported to the National Cable & Telecommunications Association (NCTA). See NCTA, *Re: CS Docket No. 97-80 (Commercial Availability of Navigation Devices)*, (March 31, 2010), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020399857>.

FIGURE 1. CABLECARD SUBSCRIBERS<sup>125</sup>

In other words, despite the earnest regulatory efforts, administrative expense, and considerable private sector engineering cost, the policy initiative leaves between 97.5 percent to over 99 percent<sup>126</sup> of STBs distributed just the way they were prior to the rules. Hence, the FCC's conclusion that the CableCARD standard has "failed to stimulate a competitive retail market for set-top boxes."<sup>127</sup>

This lack of market development can also be seen in Table 1, which shows the top five cable TV operators in the United States, accounting for over 80 percent of industry sales. None of the five companies sees more than 1.3 percent of its subscribers using retail-purchased STBs. The firms also report that they charge customers to use CableCARD-enabled devices, from

125. *Id.* Data from quarterly reports submitted to the FCC, although firms report sales as of different days. See, e.g., *Top 25 Multichannel Video Programming Distributor as of Jun. 2010*, NCTA, <http://www.ncta.com/Stats/TopMSOs.aspx> (last visited Oct. 31, 2010) (listing system subscribers); *Basic Video Customers*, NCTA, <http://www.ncta.com/Stats/BasicCableSubscribers.aspx> (last visited Oct. 31, 2010) (listing total subscribers from 1975 to 2009).

126. 489,000 equals 0.8% of 62.1 million, which is total cable subscriber-ship as of year-end 2009. See *Basic Video Customers*, NCTA, <http://www.ncta.com/Stats/BasicCableSubscribers.aspx> (last visited Oct. 31, 2010).

127. See CONNECTING AMERICA, *supra* note 7, at 50.

\$1.50 to \$2.55 per month (per card). Moreover, cable technicians must generally install the so-called “plug-n-play” boxes, which results in additional costs for operators and fees for subscribers.

**Table 1. Set-Top Boxes Distributed by Cable Systems v. Retailers**<sup>128</sup>

	Cable-CARD subscriptions	Fee per month	Installation Fee	Total Subscribers	% Cable-CARD
Cablevision	20,656	\$2.00	\$34.95	3,063,000	0.0067
Charter	30,938	\$2.00	\$35.00	4,824,000	0.0064
Comcast	296,967	\$1.50	\$25.00	23,559,000	0.0126
Cox	42,818	\$1.99	\$24.00	5,195,000	0.0082
Time Warner	48,048	\$2.55	\$26.01	12,859,000	0.0037

#### B. THE EVOLUTION OF THIRD-PARTY SET-TOP BOXES FOR SATELLITE TV

Although Section 629 applies to all MVPDs, the FCC has mandated an integration ban only for cable TV STBs.<sup>129</sup> This difference has been appropriate, the FCC argues, because DBS STBs have been available at retail outlets while cable STBs have not been.<sup>130</sup> Yet, the unbundled model, which was once the standard in the early days of satellite TV, has evolved: to-

128. Letter from National Cable & Telecommunication Association to Marlene H. Dortch, FCC (March 31, 2010) (on file with Minnesota Journal of Law, Science & Technology).

129. See CONNECTING AMERICA, *supra* note 7, at 67 n.105 (stating that the FCC directly exempted satellite operators, e.g. DirecTV and DISH Network, since they operate throughout the United States and offer devices for retail sale through unaffiliated vendors, and certain Internet Protocol TV (IPTV) providers, primarily small telephone operatives. AT&T (an IPTV provider) has neither requested nor received a waiver for its U-Verse service. Verizon FiOS is considered a cable service for regulatory purposes and is not exempted from Section 629).

130. DISH and DirecTV, however, do not use compatible STB. The same is true of AT&T and Verizon, the two major telco TV suppliers. This suggests that efforts to disintegrate boxes and network services may be difficult, fruitless, or both.



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day, the overwhelming majority of subscribers to DBS (and IPTV) video services rent or purchase STBs from service operators.<sup>131</sup>

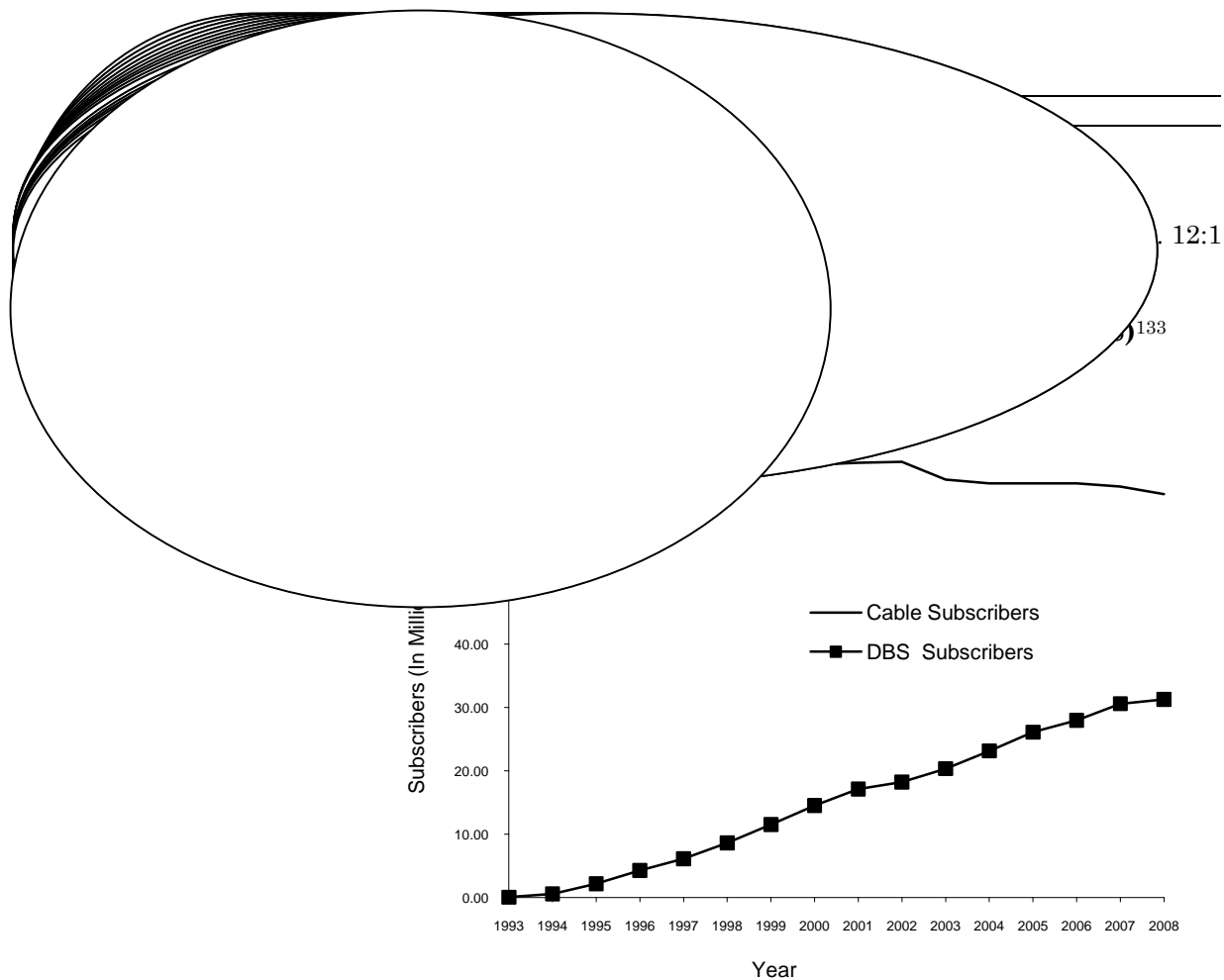
When the satellite industry initially began deploying DBS services starting in the 1990s, satellite providers utilized existing local retailers to sell their services and equipment. Circuit City, for example, was one of these retailers, receiving a percentage of each STB that was sold to consumers in addition to a percentage of the subscription fees the DBS provider was charging.<sup>132</sup> DBS providers relied on such retailers because they, in contrast to cable operators, had no presence in the local market. Cable providers, therefore, did not rely on independent retail stores to supply subscribers' equipment or to market their services; DBS did. The initial structure for satellite relied on industry standards, tailored to the two national service providers' systems, but featured independent customer purchases of boxes. Many vendors competed, including RCA, Sony, Toshiba, Zenith, General Instruments (now owned by Motorola), and Thomson (renamed Technicolor).

Yet, over time, bundled bargains offered by satellite providers began appearing and independent sales of DBS boxes declined and then vanished. It is not plausible that market power explains the migration in market structure, for the simple reason that neither DirecTV nor EchoStar possessed such power. Moreover, the DBS-wide migration, observed simultaneously for both standards, is consistent with only an efficiency explanation: DBS providers bundled boxes to increase market share against cable operators. The fact that they have been highly successful in this effort is further evidence of efficiency and against the hypothesis that the market restructuring was output-restricting, the sine qua non of monopolistic behavior (See Figure 2).

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131. It is sometimes the case that retailers serve as the sales agents, but the purchase package is determined by the operator in that there is little or no "mixing and matching" of components within the service package. Customers simply subscribe to the service through the retailer, with the network determining the STB configuration.

132. Interview with Stephen Effros, President of Effros Communications and formerly Head of the Cable Telecommunications Association (CATA), which later merged with NCTA (May 3, 2010).



That satellite TV providers tried the unbundled model and then abandoned that in favor of the bundled approach suggests that integration of the video service package can be, and has been, efficient. In attempting to create an independent retail STB market for cable devices, the FCC produces its own evidence of this fact: no independent market has sprung to life. Were major new advantages available to customers from direct

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133. 13th Annual Report to Congress - Delivery of Video Programming, 24 FCC Rcd 542, 684 (FCC 2009); Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming, 13 FCC Rcd 1034 (1998) (Providing data for years 1993–1997); Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming, 17 FCC Rcd 1244 (2002) (Providing data for years 1997–2001); *Families and Living Arrangements*, U.S. CENSUS BUREAU, [www.census.gov/population/www/socdemo/hh-fam.html](http://www.census.gov/population/www/socdemo/hh-fam.html) (last visited Nov. 21, 2010); Larry Hettick, *MSO v. DBS v. Telco: 2008 Winners and Losers by the Numbers*, CURRENT ANALYSIS (Mar. 20, 2009), <http://www.currentanalysis.com/d/2009/ctia/ctia-ar-7.asp>; *Industry Data, supra* note 113; *Projections of Households by Type: 1995 to 2010*, U.S. CENSUS BUREAU, <http://www.census.gov/population/projections/nation/hh-fam/table1n.txt> (last visited Nov. 21, 2010).

purchases via third parties, such sales would presumably materialize. Not only is it ironic that, having failed in cable, which is the dominant segment of the MVPD market, the FCC is now pushing its video “gateway” rules further, proceeding to unbundle boxes from video services offered by entrants DBS and telco TV. Even more remarkable is that the effort may deter the competitiveness of the new rivals which, in the case of DBS, are designed as one-way (download) services rather than interactive communications networks:

DIRECTV has stated that the FCC’s gateway proceeding is misguided because mandating an AllVid gateway in the home favors cable’s two-way architecture and disadvantages satellite providers, who, unlike cable providers, are adding Internet capabilities to their boxes.<sup>134</sup>

#### IV. CONCLUSION

Despite a lengthy regulatory attempt by the FCC to implement a workable regime for creating a retail market for cable STBs, such market has not developed. Moreover, the stated concern driving this regulatory initiative, that bundling cable STBs with MVPD services impairs competition in either video or STBs, appears unwarranted. The attempt by competitive entrants, notably satellite TV providers, to operate with unbundled boxes was itself a dead-end; market evolution brought STBs back into the service provider’s product bundle. Lacking market power, these firms ostensibly integrated to pursue efficiencies, not foreclosure.

A recent report by a consumer-oriented web page summarizes the curious history of STB regulations:

In 1996, Congress directed the Federal Communications Commission to make it easier for consumers to buy *set-top boxes* from third-party providers, potentially eliminating monthly lease fees. In fact, the reverse has occurred—consumers are paying more tack-on, *set-top* fees than ever. And an FCC ruling in 2007 is blamed for pushing leasing prices higher. That year, pay TV providers were forced to separate their channel changing and channel security functions in their *set-top boxes*, a move that was supposed to provide an opening for alternative *boxes*. Consumers who wanted to buy their own simply had to insert a CableCARD—similar to PCMCIA cards that were once common to laptops—provided by the pay TV firm. But the so-called “integration ban,” cable industry officials said, simply raised the cost of making **boxes**, an increase that was passed on to consumers.<sup>135</sup>

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134. Tim Doyle, *Set-Top Innovation Could Precede FCC Rules*, SNL.COM (May 21, 2010, 10:08 AM), <http://www.snl.com/interactivex/article.aspx?CDID=A-11212940-13877>.

135. See Bob Sullivan, *Set-Top TV Boxes: What Do You Pay?*, THE RED

The recently released NBP outlines the shortcomings of the current regime, but perversely proposes new, broader regulations governing converter boxes. The empirical evidence, however, suggests that such an effort will not advance competitiveness in the marketplace, but deter it.

## APPENDIX 1

CHRONOLOGY OF FCC SET-TOP BOX PROCEEDING 97-80<sup>136</sup>

Date	Type	Description
2/20/1997	NPRM	<p>In this proceeding the FCC sought comment on the implementation of section 629 of the Communications Act, entitled “Competitive Availability of Navigation Devices.” Section 629, which was added to the Communications Act as part of the Telecommunications Act of 1996 instructs the FCC to:</p> <p>Adopt regulations to assure the commercial availability, to consumers . . . of equipment used . . . to access multichannel video programming and other services offered over multichannel video programming systems, from manufacturers, retailers, and other vendors not affiliated with any multichannel video programming distributor.<sup>137</sup></p> <p>In this NPRM, the FCC states that the rules under this section shall cease to apply when the Commission determines that the markets involved are competitive and that elimination of the regulations would be in the public interest. Further, the FCC proposed the basic principle that equipment that is not part of a multichannel video programming distributors’ (MVPD’s) network distribution plan may be acquired by subscribers and attached to the network limited only by the requirement that any such equipment attached to a MVPD’s network not cause it any harm.</p> <p>The FCC also inquired about what is the best definition of “commercial availability” of navigation equipment.</p>

136. See *Electronic Comment Filing System*, *supra* note 6.

137. 47 U.S.C. § 549 (2006).

Date	Type	Description
6/24/1998	Report and Order	<p>This Order adopts rules and policies implementing section 629:</p> <p>The FCC determined that open video system operators are not covered as a consequence of the specific open video system provisions of the Communications Act which exclude open video system operators from certain regulations applicable to cable operators. Subscribers have the right to attach any compatible navigation device to a multichannel video programming system. The FCC concluded that the core requirement, to make possible the commercial availability of equipment to MVPD subscribers, is similar to the <i>Carterfone</i> principle.</p> <p>Service providers are prohibited from taking actions which would prevent navigation devices that do not perform conditional access functions from being made available by retailers, manufacturers or other unaffiliated vendors.</p> <p>Cable operators and other MVPDs can take the necessary steps to guarantee the security of their systems and their programming. The Order reaffirms the provisions of the Communications Act that prohibit the manufacture, sale and distribution of equipment designed to allow for the unauthorized reception of service.</p> <p><b>MVPDs must separate out security functions from non-security functions by July 1, 2000.</b> An exception is made for navigation devices that operate throughout the continental United States and are commercially available from unaffiliated sources, which includes DBS.</p> <p><b>MVPDs may offer devices that have security and non-security functions integrated until January 1, 2005.</b> As of that date, no MVPD shall provide new navigation devices for sale, lease, or use that perform both conditional access functions and other functions in a single integrated device. In the year 2000, once</p>

Date	Type	Description
		separate security modules are available, the FCC would assess the state of the market to determine whether that time frame is appropriate and it will review the mechanics of the phase out of boxes that have combined security and non-security functions.
5/14/1999	Order on Recon.	Petitions for reconsideration of the Navigation Devices Order were filed by the Consumer Electronics Manufacturers Association (CEMA), the National Cable Television Association (NCTA), the Telecommunication Industry Association (TIA), Time Warner, and the Wireless Cable Association International (WCA). In this <i>Order for Reconsideration</i> the FCC reviewed these petitions, reconsidered a decision made in that order relating to the application of the rules to analog equipment, but otherwise reaffirmed the Navigation Devices Order.
9/18/2000	Further Notice	This Further Notice of Proposed Rulemaking and Declaratory Ruling addressed two separate but related matters regarding the Commission's navigation devices rules. The navigation devices rules were adopted to implement Sec. 629 of the Communications Act. In adopting these rules, the FCC indicated that it would monitor the development of commercial availability of navigation devices and on reconsideration stated that it would commence a proceeding in the year 2000 to review the effectiveness of the rules and consider any necessary changes. In this proceeding, the FCC undertook that review. In addition, questions were raised as to whether certain of the mechanisms being developed by the cable television industry relating to the copying of digital video programming comply with the existing rules.
1/10/2003	Further Notice	In this Further Notice of Proposed Rulemaking the FCC sought comment on the Memorandum of Understanding (MOU) which details an agreement on a cable compatibility standard for an integrated unidirectional digital cable television receiver, as well as other unidirectional digital cable products. Such standard would allow consumers to directly attach their DTV receivers to cable systems and receive cable television services without the need for an external navigation device. On December 19, 2002 the members of the dis-

Date	Type	Description
		cussion group, headed by the Consumer Electronics Association (CEA) and the National Cable and Telecommunications Association (NCTA) reached the MOU.
4/25/2003	Order	This Order and Further Notice of Proposed Rulemaking extends the deadline concerning the prohibition on integrated devices until July 1, 2006.
12/23/2003	Order	To prevent an unintended consequence in creating disparity between MVPDs, the FCC revised the definition of Unencrypted Broadcast Television in the FCC's encoding rules.
3/17/2005	Order	The FCC extended the phase-out of integrated STBs effectively until July 1, 2007. The FCC also stated that it was "not persuaded" that the current level of competition in the navigation device market is sufficient to assure the commercial availability of navigation devices to consumers from sources other than multichannel video programming distributors (MVPDs).
10/3/2005	Order	The FCC extended the deadline for the first joint report regarding progress on the negotiation of a bidirectional agreement between the NTCA and CEA to October 14, 2005.
12/23/2005	Order	The FCC granted additional time to Hewlett Packard, Intel and ATI Technologies to file comments in response to a report filed by the cable industry on the feasibility of implementing software-based conditional access in navigation devices.
2007-2009	Waiver Requests	Various requests for waivers of the requirement for integrated STB phasing out were filed by different companies.
03/16/2010	n/a	National Broadband Plan released. The purpose of the plan was to reveal FCC's plans for the future. With respect to cable STBs, the plan discusses in some detail the difficulty of the CableCARD standard to develop a robust retail marketplace for STBs. <sup>138</sup>

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138. See CONNECTING AMERICA, *supra* note 7, at 50–52.



04/21/2010	NOI	The NOI seeks comment on specific steps the FCC can take to “unleash competition in the retail market for smart, set-top video devices (“smart video devices”) that are compatible with all multichannel video programming distributor (MVPD) services.” The Commission wants to explore the potential for allowing any electronics manufacturer to offer smart video devices at retail that can be used with the services of any MVPD and without the need to coordinate or negotiate with MVPDs.
04/21/2010	Further Notice	With this FNPRM the FCC proposes new rules for the CableCARD regime in the interim “until the successor solution becomes effective.” In the Second Report and Order related to navigation devices, rules were adopted requiring a specific interface on leased STBs to allow recording on digital recording devices. Multiple parties have raised concerns about whether the rule is specific enough to be effective and whether other interfaces could equally achieve this purpose. The FCC seeks comment on proposed rules to more fully specify the functionality of this interface and to enable other interfaces as well.
10/14/2010	Report and Order on Recon.	FCC adopted new rules that (1) require cable operators to support the reception of switched digital video services on retail devices; (2) prohibit price discrimination against retail devices; (3) require cable operators to allow self-installation of CableCARDS where device manufacturers offer device-specific installation instructions; (4) require cable operators to provide multi-stream CableCARDS by default; and (5) clarify that CableCARD device certification rules are limited to certain technical features.