

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

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In the Matter of	)	
	)	
International Comparison and Consumer	)	GN Docket 09-47
Survey Requirements in the Broadband	)	
Data Improvement Act	)	
	)	
A National Broadband Plan for	)	GN Docket 09-51
Our Future	)	
	)	
Deployment of Advanced	)	GN Docket 09-137
Telecommunications Capability to All	)	
Americans in a Reasonable and Timely	)	
Fashion and Possible Steps to Accelerate	)	
Such Deployment Pursuant to Section	)	
706 of the Telecommunications Act.	)	

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NBP Public Notice #16

TESTIMONY OF THOMAS W. HAZLETT

December 18, 2009

Testimony by Thomas W. Hazlett

December 10, 2009

Panel discussing the Berkman Center Study on Broadband Policy

Federal Communications Commission, Washington D.C.

(This formed the basis of the invited testimony on Dec. 10, 2009.)

## I. INTRODUCTION

My name is Thomas W. Hazlett. I am a professor of law & economics at George Mason University, where I head the Information Economy Project. I formerly served as Chief Economist of the Federal Communications Commission, and am a columnist for the *Financial Times*. I have written widely on the economics of telecommunications markets and the effect of government regulation in the sector.

The Berkman Center study on broadband policy<sup>1</sup> ambitiously attempts to review the data on various regulatory approaches pursued in countries around the world, and to draw conclusions about how regulators should proceed in the U.S. The goal, advancing the development of advanced communications services and high-capacity networks, is one that is widely shared. Unfortunately, its study of global markets is fundamentally flawed, failing both conceptually and empirically. Moreover, abundant and compelling economic evidence is simply ignored. Of particular note is a series of natural experiments performed here in the U.S., where a variety of regulatory strategies have been implemented. Market reactions reveal a strong and positive reaction, in the deployment of services and applications, to deregulatory reforms in both voice and data services. Important studies in refereed academic journals, unreported in the Berkman report, document such results, presumably of vital interest to U.S. policy makers, as these data are taken from the market which will deliver – or deter – the information services American consumers and businesses desire to access.

My brief notes on the lengthy Berkman study do not constitute a top-to-bottom review. Instead, I will focus on three general points. First I explain why the basic statistical model in the report is ill-crafted and does not produce the estimated results claimed by its authors. Second, I demonstrate how cross-sectional broadband data produce conflicting rankings. Third, I offer a quick synopsis of the empirical evidence regarding the U.S. experience with alternative regulatory regimes. This includes market reactions (1) in fixed voice markets responding to the end of UNE-P rules by federal court order in March 2004; (2) in broadband services, responding to the FCC's elimination of network sharing mandates for

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<sup>1</sup> The Berkman Center for Internet and Society at Harvard University, *Next Generation Connectivity: A Review of Broadband Internet Transitions and Policy from Around the World*, Draft Report submitted to the FCC (Oct. 2009) (Berkman).

digital subscriber lines (DSL) in 2003 and 2005; and (3) in the pattern of fiber network build-out before and after unbundling rules were pre-empted by the FCC.

## II. THE BERKMAN REGRESSION MODEL

The empirical strategy of the Berkman report relies on cross-country comparisons to estimate the correlation between broadband penetration and network sharing mandates – “unbundling” -- imposed by regulators. Adjusting for other factors, it seeks to observe whether a country that imposes unbundling exhibited a statistically significant increase in broadband subscribership. The study reports that a positive correlation exists between regulation and penetration, and asserts causality from the former to the latter.

The results obtained are unconvincing. When the small dataset used is expanded to include a more complete picture, the asserted correlation between regulation and penetration vanishes or reverses.<sup>2</sup> Similarly, when an omitted variable (noting the time at which DSL services were made available within a given country) is properly included in the regressions, the asserted correlation disappears.<sup>3</sup> Then demand and supply functions are estimated with techniques that are wrong on several levels, and findings are misinterpreted in the Berkman paper.<sup>4</sup>

Of the many problems here, the arbitrary reclassification of the “unbundling” country sample may be the most troubling.<sup>5</sup> South Korea has long been classified in other data sources used by the Berkman report, including the OECD, as instituting an unbundling regime in 2002.<sup>6</sup> Research dealing specifically with the structure of broadband markets there has added substance to the classification.<sup>7</sup> Yet the Berkman report flips South Korea to an example of “open access” from 1997. This is methodologically wrong and factually incorrect; the report misconstrues vertical restrictions for a wholesale price control regime. No such regime was in place to impose network sharing mandates until 2002. A companion error is committed in assigning the U.S. to the never-regulated (with unbundling) sub-sample, when in fact the U.S. was in many respects a world leader in unbundling mandates. Indeed, this produces a great empirical opportunity, because regulated telephone networks

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<sup>2</sup> R.W. Crandall, E. M. Ehrlich, and J. A. Eisenach, *Declaration of Robert W. Crandall, Everett M. Ehrlich and Jeffrey A. Eisenach Regarding the Berkman Center Study (NBP Public Notice 13)* (Nov. 16, 2009) (Crandall et al., 2009).

<sup>3</sup> B. Howell, *Comments to the Federal Communications Commission, Washington D.C. on Broadband Study Conducted by the Berkman Center for Internet and Society NPB Public Notice # 13* (Nov. 13, 2009).

<sup>4</sup> G.S. Ford, *Whoops! Berkman Study Shows “Open Access” Reduces Broadband Consumption*, Phoenix Center Perspectives (Nov. 12, 2009) (Ford 2009).

<sup>5</sup> Crandall, et al. 2009.

<sup>6</sup> OECD Working Party on Telecommunication and Information Services Policies, *The Development of Broadband Access in OECD Countries* (Oct. 29, 2001), pp. 32-3.

<sup>7</sup> Kyounglim Yun, Heejin Lee, and So-Hye Lim, *The Growth of Broadband Internet Connections in South Korea: Contributing Factors*, Stanford University Asia/Pacific Research Center (Sept. 2002) (Yun, et al. 2002).

have existed side-by-side with never-regulated cable TV networks in the U.S. broadband space. “Open access” mandates were imposed to assist entrants use phone facilities to provide digital subscriber line (DSL) service to retail customers, and were then stripped away, allowing even greater empirical clarity – ignored in the Berkman report but not in the academic literature, as I detail below.<sup>8</sup>

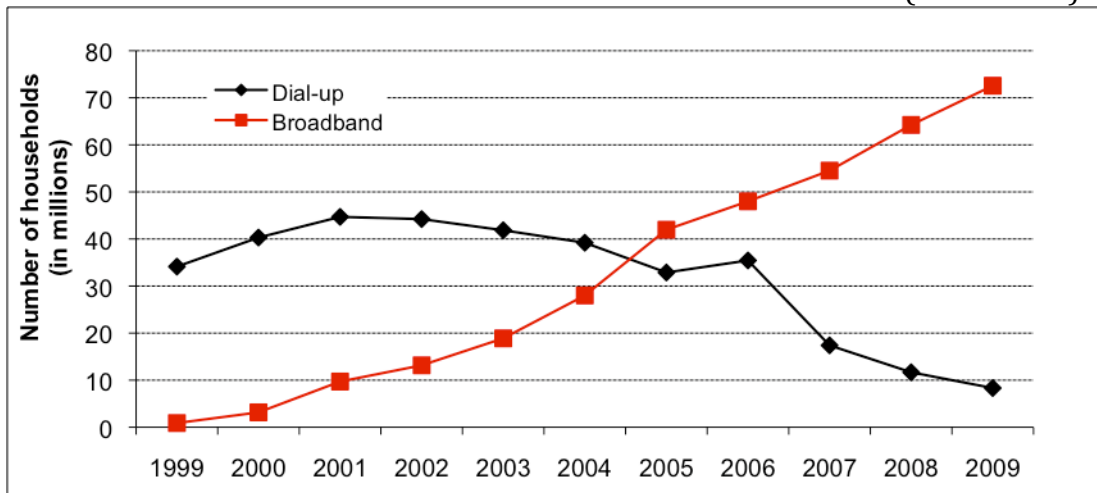
I add just one observation here. U.S. innovators created the mass market in online services, an outcome facilitated by the openness of U.S. capital markets, a relative lack of entry barriers, and “the unregulation of the Internet.”<sup>9</sup> Dial-up services quickly took off, bringing network access to 45 million households in 2001. See Figure 1. Then, the spontaneous emergence of broadband alternatives overwhelmed dial-up. This very positive cycle of “creative destruction” figures into the Berkman analysis, however, as a negative factor.

First, the early success of the U.S. is seen to be lost due to an over-reliance on the “horse race” analogy. Second, great enterprises created in the emergent market – including Internet applications that were launched in America but now successfully compete with others globally – are simply excluded from analysis. And third, dial-up continues to operate as a relatively cheap and easy access technology, reducing the U.S. position in the broadband penetration horse race.

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<sup>8</sup> In short, the Berkman analysis determines that South Korea engaged in unbundling regulation early on, but that the U.S. never did. This conclusion is opposite that rendered by experts on the matter: “Even during the introduction of competition, [Korea Telecom’s] vertically integrated structure remained intact. Therefore, KT could provide the Internet services over its own vertically integrated network without any kind of regulatory burden. Although the government is scheduled to implement open access for ISPs and unbundle the local loops of incumbent telecommunications operators (e.g., KT), its implementation is not foreseeable... The overall broadband market shape shows a stark contrast with the U.S. case. In the United States, the regional Bell operating companies (RBOCs)... have been under heavy regulatory codes, along the lines of [the] common carrier regulatory model... This is often referred to as ‘asymmetric regulation for broadband technologies...’” Yun, et al. 2002, p. 21. The passage cites to J. Hausman, J.G. Sidak, and H. Singer, *Residential Demand for Broadband Telecommunications and Consumer Access to Unaffiliated Internet Content Providers*, 18 YALE JOURNAL ON REGULATION 129 (2001), and R. Noll, *Resolving Policy Chaos in High-Speed Internet Access*, Stanford Institute for Economic Policy Research Discussion Paper 01-13 (2002).

<sup>9</sup> Jason Oxman, *The FCC and the Unregulation of the Internet*, FCC Office of Strategic Planning & Policy Analysis Working Paper No. 31 (July 1999).

FIG 1. U.S. INTERNET RESIDENTIAL SUBSCRIBERS: DIAL-UP V. BROADBAND (1999-2009)<sup>10</sup>

There are still some 8 million U.S. dial-up households, a relatively high level. The outcome is driven by unmetered local calling in the U.S. Were local calls to become expensive, so would dial-up, and most of the 8 million would subscribe to broadband, boosting America in the “broadband race.” This key explanatory factor is omitted from the Berkman analysis.

### III. RELIANCE ON GLOBAL BROADBAND RANKINGS

One area where I strongly agree with the Berkman report is in its observation that the “horse race” aspect of global broadband rankings can be problematic both because there is “too much emphasis on one particular measure [such as] penetration per 100 inhabitants,” and “too much emphasis on precisely where the United States ranks, as opposed to on [sic] defining a range of metrics that would allow us to identify countries that are appropriate targets of observation...”<sup>11</sup>

There is much wisdom in that statement. Unfortunately, the report’s empirical approach, including the regression analysis undertaken, repeatedly falls back to the “horse race,” leaving the U.S. marketplace experience most useful to policymakers untapped as a useful “target of observation.”

<sup>10</sup> Sources: Number of households from U.S. Census Bureau, *National Data Book* (2009; available at <http://www.census.gov/compendia/statab/>). Dial-up and broadband adoption rates through 2006 as a percentage of all households are from S. Greenstein and R. McDevitt, *The Broadband Bonus: Accounting for Broadband Internet's Impact on U.S. GDP*, Technology Policy Institute (Jan. 2009). Dial-up and broadband adoption rates from 2007 through 2009 from John Horrigan, *Home Broadband Adoption Report* (2007 through 2009; available at <http://www.pewinternet.org>). The number of households for 2009 is projected linearly from 1999-2008 data. 2008 dial-up adoption rate is estimated roughly as 10% from the “Trends in Home Internet Access” in the Home Broadband Adoption Report (2009).

<sup>11</sup> Berkman Report, p. 26.

The Berkman study begins by noting that, “Our findings confirm the widespread impression that the United States is a middle-of-the-pack performer.”<sup>12</sup> The paper’s regressions then rely on these rankings, adjusting for other variables. Yet the data are subject to widely differing interpretations. Rival treatments often come out distinctly.<sup>13</sup>

One issue, for example, is the OECD’s use of the “per 100 persons” ranking when the “per 100 households” ranking is the theoretically preferred measure, given that the issue is one of access to service (everyone in a connected household generally has access). Also of interest is the issue of jurisdictional size. Comparing the U.S. as a whole to the E.U. as a whole produces one ranking; comparing the U.S. to each of the E.U. member states produces another; comparing the 50 U.S. states to each of the E.U. states produces yet another.

As a simple experiment, I recently searched for data from public sources – and took the first reputable broadband subscribership and population estimates I found.<sup>14</sup> I limited my ranking to the five large high-income economies – the U.S., Japan, England, Germany, and France. This recognizes that such countries may share certain characteristics that smaller countries do not. The resulting broadband rankings per 100 households are as given in Table 1. It is seen that the U.S. leads its peer countries in broadband penetration, although all five are within a fairly narrow band.

TABLE 1. BROADBAND SUBSCRIPTIONS PER 100 HOUSEHOLDS (1 <sup>ST</sup> QUARTER 2009)				
Country	Rank	HHs	BB Subs	Penetration Rate
USA	1	118,158,509	83,968,547	71.1
France	2	25,623,117	18,009,500	70.3
UK	3	25,463,833	17,661,100	69.3
Japan	4	45,385,243	30,631,900	67.4
Germany	5	37,422,617	24,144,350	64.5

The purpose of this exercise is two-fold. First, broadband rankings are highly sensitive to the approach taken and the database used. Those displayed here are distinct from those published by the OECD, e.g. Second, focusing on the U.S. peer group tends to place the U.S. in a highly competitive position.

<sup>12</sup> Berkman, p. 10.

<sup>13</sup> See, e.g., See, e.g., Scott Wallsten, *Understanding International Broadband Comparisons 2009 Update*, Technology Policy Institute (June 2009).

<sup>14</sup> [Broadband subscriptions](#) were from international consultancy Point Topic for 1Q2009 (the most recent reported), [population](#) from the CIA Factbook, and [household size](#) from United Nations statistics. Thomas W. Hazlett, *The Broadband Numbers Racket*, FINANCIAL TIMES (Sept. 17, 2009). See also, Thomas W. Hazlett, *We’re Number Two? COMMENTARY* (Dec. 2009), 35.

None of this is to say that the U.S. cannot learn from policy makers in other countries or the regulatory strategies pursued there. Nor does it establish that the U.S. leads the world. What it does is caution against the simplistic notion that the U.S. is lagging the world and must embrace desperate measures. A measured assessment of growth opportunities from improved public policy is inevitably the proper course.

This is the takeaway that the Berkman report gets wrong. It writes that some “have responded by criticizing the quality of the [global broadband] data in various ways, asserting that the United States broadband market is performing well and there is no concern to be addressed.”<sup>15</sup> But that conclusion does not follow from the premise. No matter where the U.S. is ranked there are many policy issues to address. The problem with misleading empirical analysis is that it misleads policy – whether the U.S. is leading or lagging the metaphorical horse race.

#### IV. NATURAL EXPERIMENTS IN THE U.S.A.

A glaring omission in the Berkman report is its lack of analysis of U.S. marketplace data revealing the effectiveness of unbundling rules or “open access” requirements for broadband operators. The paper offers what may be a theoretical justification for dismissing such evidence:

From the start, however, implementation of unbundling was burdened and thwarted, largely by incumbents’ resisting implementation through footdragging and litigation, but also by a judiciary highly skeptical of the theory behind unbundling, receptive to the arguments of the incumbents, and exhibiting little deference to the judgment of the FCC (p. 78)... Half a decade after the formal adoption of open access provisions, they still were not effectively implemented as the Internet access market began its broadband transition (p. 82)... In summary... the unbundling provisions of the 1996 Telecommunications Act were largely stillborn; certainly in their application to the emerging broadband market (p. 83).

This statement is most curious from a social science perspective. In the extant case, we seek to understand the effects of different telecommunications policy approaches on economic outcomes. The manner in which such rules are crafted and implemented is an integral aspect of that process. When particular regimes fail, that is a material fact.<sup>16</sup> Indeed, the network sharing mandates imposed by regulators under the Telecommunications Act of 1996 were highly contentious and, in the end, largely eliminated for both narrowband (voice) and broadband (data)

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<sup>15</sup> Berkman, p. 26.

<sup>16</sup> Gregory L. Rosston & Roger G. Noll, *The Economics of the Supreme Court’s Decision on Forward-Looking Costs*, 1 REVIEW OF NETWORK ECONOMICS 81 (2002).

services. But that regulatory experience yields volumes of information as to how, in the specific institutional context we are dealing with, network regulation performs.

Moreover, the richness of the U.S. regulatory pattern yields natural experiments that produce a bounty of information on the impact of legal rules.<sup>17</sup> Rules of great scope and importance were instituted, adjusted, and then – in some cases – eliminated. This allows economists to observe how markets responded to changing rules. Indeed, a healthy academic literature has developed.<sup>18</sup> The lessons are revealing, and of direct relevance to the question of how to craft efficient broadband rules today.

#### A. The End of UNE-P and the Growth of Fixed Voice Competition

From 1996-2004 the FCC pursued a strategy of promoting competition in voice services by imposing wholesale rates on incumbent telecommunications networks through a regime that came to be known as “UNE-P.”<sup>19</sup> The Commission is familiar with the history and the outcome of the policy, but the marketplace effects following the end of that regime are important to consider. In the event, UNE-P terms and conditions set by state and federal regulators were overturned by a unanimous March 2004 decision by the D.C. Circuit Court of Appeals in *U.S.T.A. v. FCC*, also known as “*USTA II*.”<sup>20</sup> The regime had allowed long-distance operators AT&T and MCI to provide retail connections via incumbent local exchange carriers’ networks, and this “resale” competition was effectively ended with the collapse of UNE-P. The

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<sup>17</sup> See, e.g., Gerald Faulhaber, *Policy-Induced Competition: The Telecommunications Experiments*, 15 INFORMATION ECONOMICS & POLICY 79 (2003).

<sup>18</sup> A small sample would include Robert S. Pindyck, *Pricing Capital Under Mandatory Unbundling and Facilities Sharing*, NBER Working Paper No. 11225 (March 2005); Jerry A. Hausman and J. Gregory Sidak, *DID MANDATORY UNBUNDLING ACHIEVE ITS PURPOSE? EMPIRICAL EVIDENCE FROM FIVE COUNTRIES*, 1 JOURNAL OF COMPETITION LAW AND ECONOMICS 173 (March 2005); Nicholas Economides, Katja Seim, and V. Brian Viard *Quantifying the Benefits of Entry into Local Phone Service*, 38 *RAND Journal of Economics* (2008); Glen O. Robinson and Dennis Weisman, *Designing Competition Policy for Telecommunications*, 7 REVIEW OF NETWORK ECONOMICS 509 (Dec. 2008).

<sup>19</sup> The system of “unbundled network elements – platform” allowed competitive rivals to use incumbent carriers’ facilities to provide the entire phone service to retail customers. The advantage of using UNE-P rather than the “total service resale” (TSR) provided for by statute was that the former was typically priced much lower under the total element long-run incremental cost (TELRIC) method. The key feature of this formula was that it estimated the costs that a new state-of-the-art network would incur. In a sector in which costs (for a given network infrastructure) are declining over time, these costs are predictably below the actual costs incurred by the incumbent carrier. See Alfred E. Kahn, *LETTING GO: THE PROCESS OF DEREGULATION OR THE TEMPTATION OF THE KLEPTOCRATS AND THE POLITICAL ECONOMY OF REGULATORY DISINGENUOUSNESS* (Brookings; 1998); Alfred E. Kahn, Timothy Tardiff, and Dennis Weisman, *The Telecommunications Act at Three Years: An Economic Evaluation of its Implementation by the Federal Communications Commission*, 7 INFORMATION ECONOMICS & POLICY 319 (1999); Alfred E. Kahn, *LESSONS FROM DEREGULATION: TELECOMMUNICATIONS AND AIRLINES AFTER THE CRUNCH* (Brookings; 2004); Jerry Ellig and Nicholas Taylor, *What Did the Unbundled Network Element Platform Cost?* 14 *COMMLAW CONSPICUOUS* (2005); Robert Crandall, *COMPETITION AND CHAOS: THE U.S. TELECOMMUNICATIONS SECTOR SINCE 1996* (Brookings; 2005).

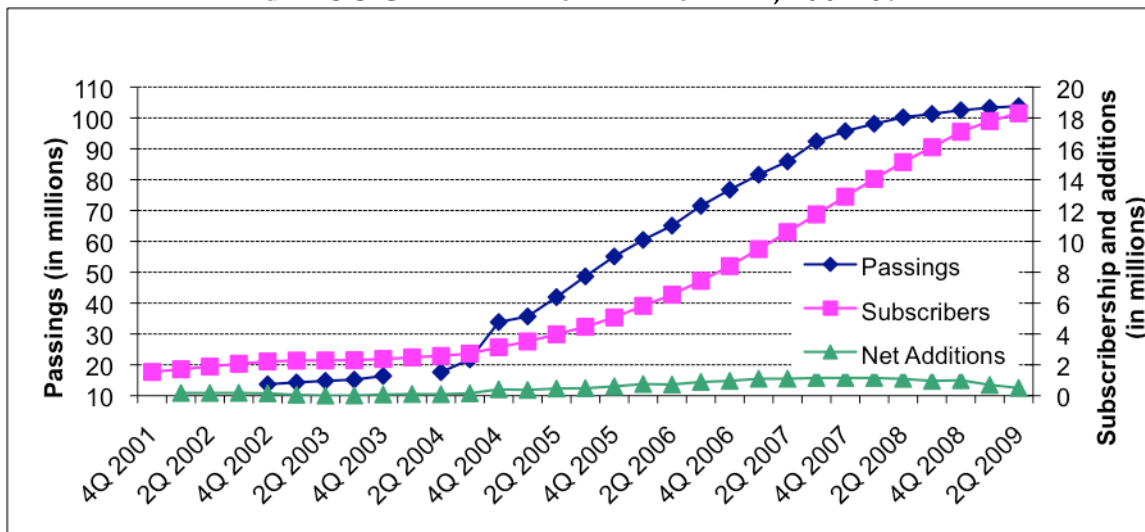
<sup>20</sup> *United States Telecom Ass’n v. FCC*, 359 F. 3d 554 (D.C. Cir. 2004) (*USTA II*), pets. for cert. filed, Nos. 04-12, 04-15, 04-18 (June 30, 2004).



court declared certain network sharing mandates illegal on the grounds that they undermined the stated goal of the 1996 Telecommunications Act – the creation of facilities-based competition. Hence, the empirical outcome is highly instructive: facilities-based competition took off in the wake of the *USTA II*.

As seen in Figure 2, there had been very little cable telephone service prior to 2004, but soon thereafter cable phone build-out took-off. This is consistent with the view that the presence of low-priced, regulated wholesale access to existing networks undermines incentives to build competitive infrastructure. This view is derived from economic theory, and is widely held by market analysts<sup>21</sup> and market entrants attempting to construct new networks.<sup>22</sup>

FIG. 2. U.S. CABLE TELEPHONE DEPLOYMENT, 2001-09<sup>23</sup>



Other factors were likely involved in the post-2003 cable telephony increases. In particular, voice-over-Internet telephony was maturing through the period in question. It is not readily apparent how much of the cable build-out was attributable to cost declines as opposed to improved economic incentives associated with the changing regulatory climate. What is discerned, however, is that the creation of head-to-head competition in local telephone access – generally identified as the key policy goal of the Telecommunications Act of 1996 – was widely achieved *after* the elimination of aggressive unbundling rules for fixed voice services. The current market structure, where over 90% of U.S. homes can choose between rival fixed line operators, owes nothing to -- and may have been delayed by -- unbundling policies.

<sup>21</sup> Dennis Saputo, James Veneau, Mark Alexander and Julia Turner, *The Far-Reaching Impact of UNE-P Regulation*, Moody’s Investors Service (Oct. 2003).

<sup>22</sup> Teleport Communications Group, *Effects of Resale on Facilities-Based Competition* (Nov. 1995).

<sup>23</sup> Sources: Federal Communications Commission, Local Telephone Competition (July 2009); Leichtman Research Group - Research Notes (1Q 2002 through 3Q 2009).

## B. Market Performance Through Regime Switches for Broadband Services<sup>24</sup>

U.S. markets provide fertile ground for empirical analysis given the manner in which broadband rules have been altered over time. In the early days of broadband technology, telephone carriers supplying DSL services were subject to extensive unbundling rules, while cable TV operators were not. This dichotomous market structure was abruptly changed when the Commission voted to end “line sharing” in Feb. 2003. This policy had allowed third parties to lease the high-frequency portion of incumbent carriers’ voice lines, using the shared link to provide data services to retail customers at relatively low (wholesale) rates. Ending “line-sharing” dramatically raised the prices charged competitive local exchange carriers (CLECs), undercutting their business models.

Then, in Aug. 2005, after the U.S. Supreme Court had refused to overturn the FCC’s deregulatory policy for cable TV systems,<sup>25</sup> the Commission further deregulated telephone carriers, eliminating remaining open access rules by designating DSL as an “information service.”

This state of affairs allows analysts three windows with which to view the competition between cable modem and DSL services. Of interest is the relative success of cable modem services (CM) versus DSL in terms of subscribership. Where the implementation of “open access” rules stimulates innovation sufficient to dominate any potential investment disincentives, subscriber growth should reflect this. Specifically, cable growth should be disadvantaged relative to DSL growth during the time that “open access” regulation is in effect.

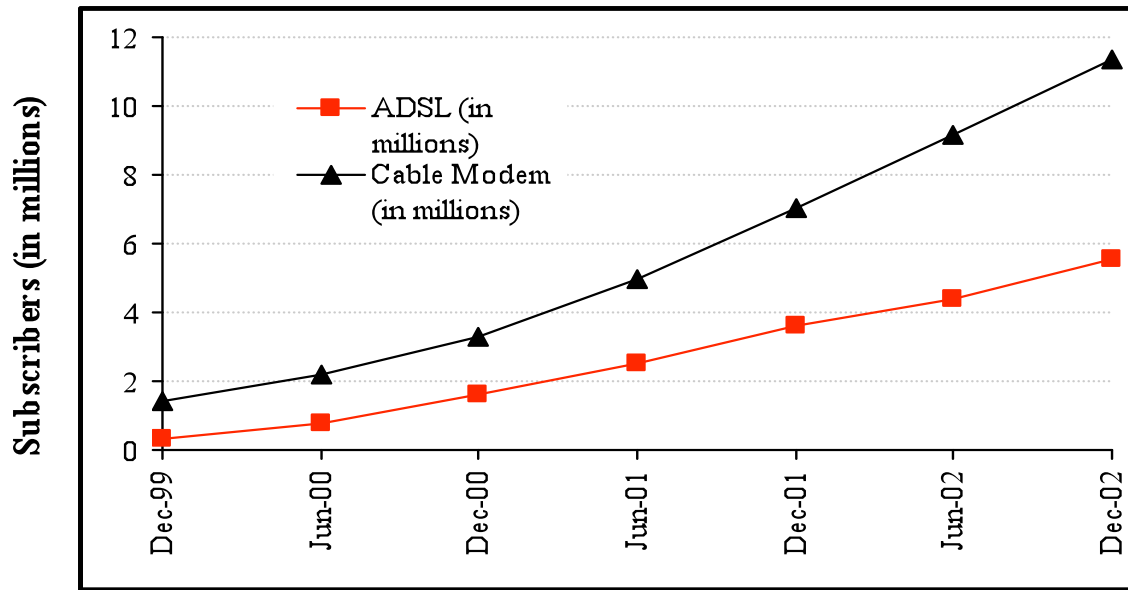
### i. Period I (DSL regulated)

Until 1Q2003, DSL was regulated under relatively tight wholesale price controls. During this period, cable operators emerged as early leaders in the “broadband race.” Through 2002, CM households held nearly a 2-1 advantage over DSL households. See Figure 3.

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<sup>24</sup> This section relies on Thomas W. Hazlett and Anil Caliskan, *Natural Experiments in U.S. Broadband Regulation*, 7 REVIEW OF NETWORK ECONOMICS 460 (Dec. 2008).

<sup>25</sup> *National Cable & Telecommunications Assn. v. Brand X Internet Services*, 545 U.S. 967 (2005).

FIG. 3. CABLE MODEM V. DSL SUBSCRIBERSHIP, 1999-2002<sup>26</sup>

Was this decisive CM edge caused by regulatory differences? Later evidence, gleaned from regime change, would soon suggest that it was. But even at the time, there was important knowledge weighing on this issue. Two key parties, the FCC and a major telephone company, were both convinced that a lack of regulation was materially assisting CM deployments. That is the precise rationale the FCC used to resist widespread calls to impose “open access” rules. The FCC Chairman, William Kennard, stated in July 1999:

[W]e don't have a duopoly in broadband. We don't even have a monopoly in broadband. We have a ‘no-opoly.’... “So how do we get Americans broadband pipes? .. [B]y letting a competitive marketplace thrive.”<sup>27</sup>

GTE, a large local exchange carrier, which joined with AOL, the leading Internet Service Provider, shared the Commission’s empirical perspective. It sought to promote “open access” rules on cable modem suppliers.<sup>28</sup> Given that GTE was a direct cable rival in the emerging market for broadband services, it is clear that the firm believed that regulation would retard, rather than stimulate, CM deployment.

<sup>26</sup> Source: Hazlett & Caliskan (2008).

<sup>27</sup> Remarks of Federal Communications Commission Chairman William E. Kennard (No. Calif. FCBA, San Francisco, CA; July 20, 1999).

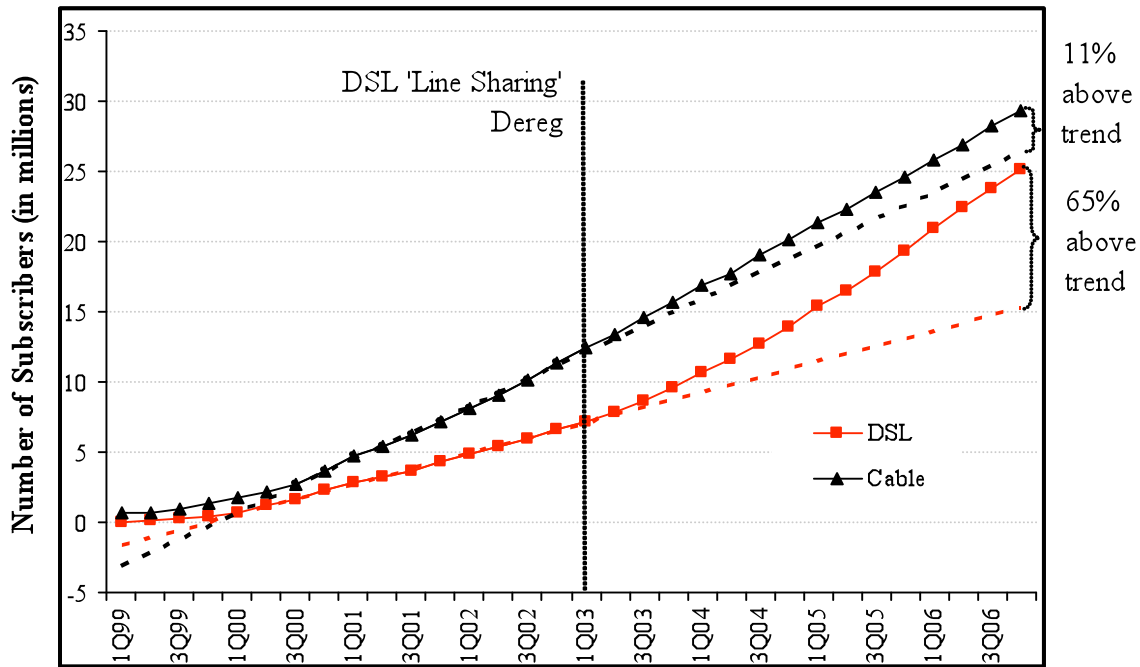
<sup>28</sup> George Bittlingmayer and Thomas W. Hazlett, “Open Access”: *The Ideal and the Real*, 26 TELECOMMUNICATIONS POLICY 29 (June 2002).

ii. Period II (DSL “line sharing” ended)

The elimination of line-sharing raised wholesale rates, undermining “open access.” In line with this, data-CLEC growth was adversely impacted. But the key issue is what happened to overall broadband growth, and DSL in particular?

DSL lines spurred in the post-deregulation period, sending the total broadband trend much higher. Quarterly subscriber growth, which had trailed cable nearly two-to-one under line-sharing, matched cable modems within a few quarters.

FIG. 4. CM & DSL SUBSCRIBER GROWTH PRE- AND POST-DEREGULATION



iii. Period iii (DSL an “information service”)

With further deregulation in mid-2005, DSL exhibited another increase from trend.<sup>29</sup> The larger impact was apparently associated with the policy reform of 1Q2003, however. At that pivot point, the projected year-end 2006 DSL universe is projected to be about 15 million households. The actual year-end DSL subscribership was over 25 million. The 65% increase from trend did not come at the expense of cable modems, which maintained their growth profile. And the results cannot be attributed to marketplace changes unconnected to U.S. policy shifts, a possibility adjusted for in regressions that used Canadian cable modem and DSL subscribership as control variables. The implication of the evidence is that U.S.

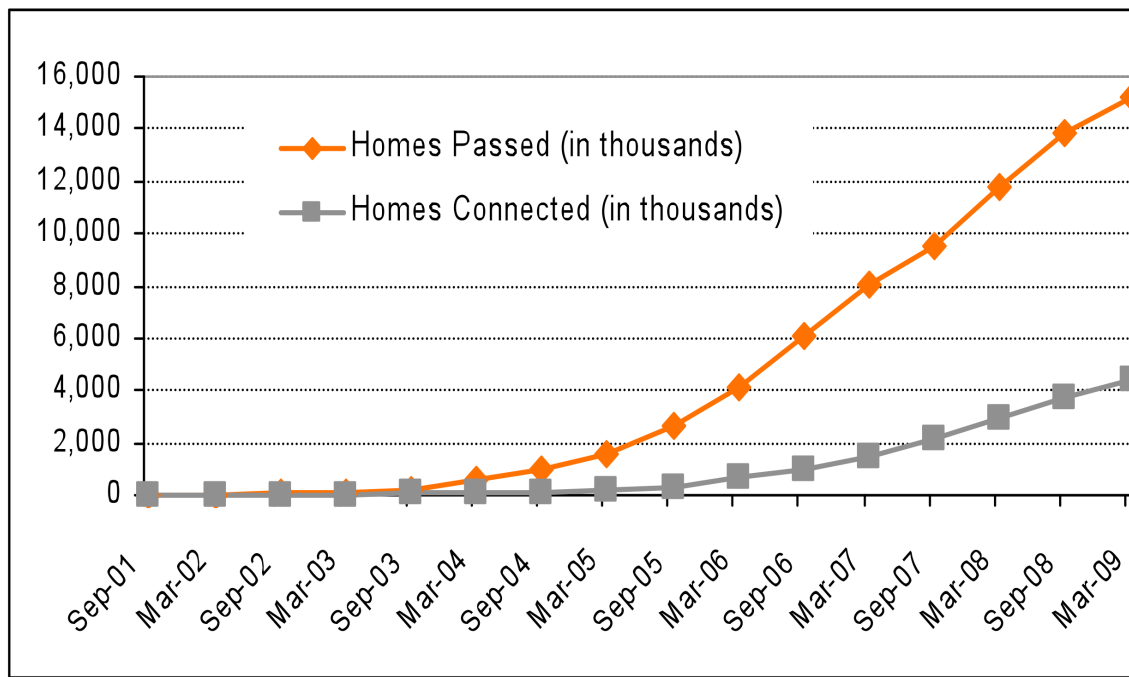
<sup>29</sup> That incremental effect is not shown here, as the 2003 and 2005 DSL deregulations are combined in Figure 4. The effect is quantified, and found statistically significant, in Hazlett & Caliskan (2008).

consumers responded very positively to policy choices that refrained from imposing “open access” or eliminated such rules once in place. The entire three-stage regulatory path is consistent with this interpretation.

iv. Fiber Unbundling

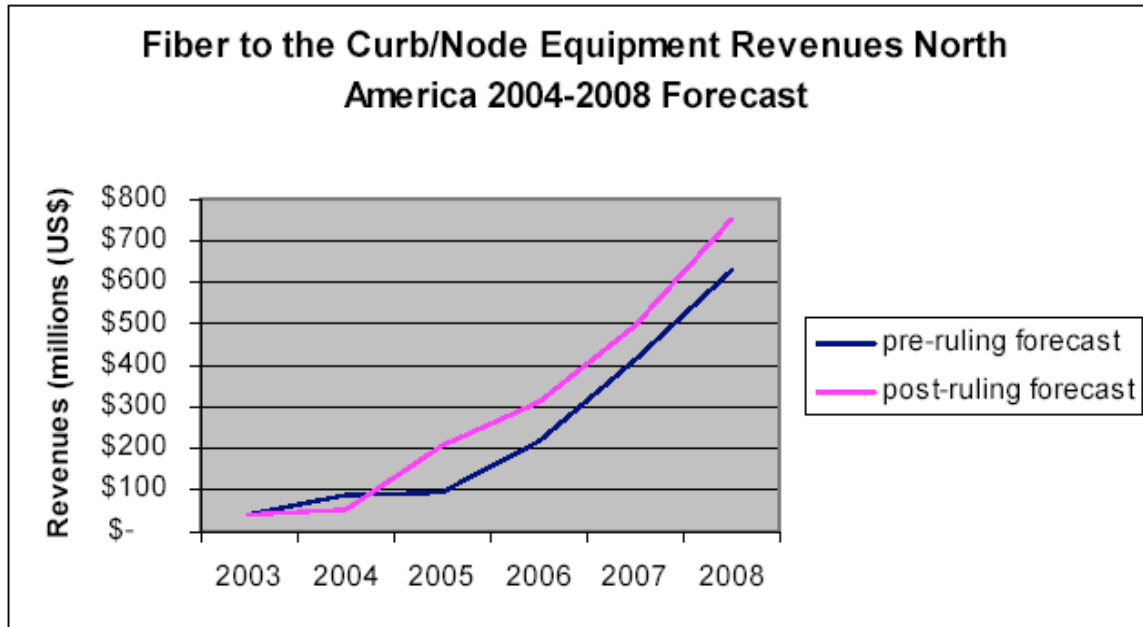
Counting U.S. policy on fiber networks, there is a fourth window to consider. In simple terms, there was virtually no fiber-to-the-home (FTTH) being deployed in the U.S. prior to the October 2004 decision by the FCC to pre-empt fiber unbundling rules. At that point, substantial investments commenced such that today, more than million households are able to subscribe to the Internet through ultra-fast fiber connections. See Figure 5. Hence, the pattern is consistent across all four policy regime windows.

FIG. 5. FTTH HOMES PASSED AND SUBSCRIBERS (U.S.)<sup>30</sup>



Many experts asserted that the correlation reflected causality. Fiber industry sales forecasts, e.g., were projected by industry consultancy Gartner. Their initial forecast for 2004-08 was undertaken prior to the FCC deregulation. When the decision to bar unbundling obligations on new fiber networks was made, Gartner explicitly upped its sales estimates for fiber optic inputs. See Figure 6.

<sup>30</sup> Source: RVA Market Research and Consulting, *Fiber-to-the-Home: North American Update* (April 2009; prepared for the FTTH Council). Mar-02, Mar-03, Mar-04 extrapolated averages of adjacent periods.

FIG. 6. GARTNER FIBER FORECASTS, 2004-  
08<sup>31</sup>

## V. CONCLUSION

There is much to learn about the way consumers, networks, application vendors and investors react to regulatory changes in broadband. The manner in which the Berkman paper attempts to look at cross-sectional penetration differences, however, does not make much progress. The regression model it estimates is fundamentally misaligned and does not produce the results claimed. Its reliance on the broadband “horse race,” and its interpretation of the data therein, are unconvincing. More generally, it overlooks the wide range of economic research that focuses on the large number of natural experiments in narrowband and broadband markets now available for viewing. These episodes, carefully studied, make the costs and benefits of alternative regulatory approaches visible. I suggest that the Commission expand its dataset to take account of the rich and widely varied policy literature that may profitably be employed to inform its choices.

<sup>31</sup> Gartner Consulting, *One Gigabit or Bust Roundtable* Presentation (Nov. 15, 2004; available at <http://www.cenic.org/events/archives/1gob/112004/mgilbertpres.pdf>).