

NERA

Economic Consulting

INTERMODAL TELECOMMUNICATIONS COMPETITION: IMPLICATIONS FOR REGULATION



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William E. Taylor

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC.

200 CLARENDON STREET, 35TH FLOOR

BOSTON, MASSACHUSETTS 02116

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How Markets WorkSM

Intermodal Competition and Telecommunications Deregulation



Overview

- § Universal expectation of “dependent” competition in retail telecom markets.
 - Last-mile monopoly
 - Consequent regulation of wholesale services:
 - Mandatory unbundling
 - Price regulation

- § Surprising relative growth of intermodal competition
 - Cable telephony
 - Wireless
 - Broadband - VoIP

- § Effects on regulation:
 - Reconsider regulation of wholesale services
 - Reconsider analysis of competition in wholesale markets
 - Problems with *ex ante* wholesale regulation and the need for parity across platforms



Regulation in a World of Dependent Competitors

Regulation with Dependent Competitors



- § Long experience in regulating and deregulating retail telecom markets.
 - Cost-of-service replaced by price regulation replaced by pricing flexibility or deregulation where warranted.
 - General agreement on market power as trigger. General disagreement on everything else.

- § Less experience, but long-time economic regulation of wholesale services in the U.S. Assumption of a single vertically-integrated ILEC network with dependent competitors drove regulatory structure:
 - Carrier access services since 1984
 - Wholesale local exchange services (UNEs / resale) since 1996.
 - Little thought regarding regulation or deregulation of wholesale services.
 - Understanding the relationship between retail and wholesale services and regulation is now necessary, due in part to intermodal competition.

Regulation with Dependent Competitors



- § Regulatory parity particularly critical here:
 - where markets are characterized by rapid technological change and competing platforms or technologies are subject to lock-in or path dependence.

- § Such regulation is not a simple squabble over rents -- does not merely transfer welfare among carriers -- but inevitably affects consumers' technology choices,
 - which can have large and irreversible welfare effects on consumers, reducing economic efficiency and productivity by distorting the competitive market outcome and driving the market to an inefficient platform or technology.

- § How can parity be achieved when regulatory jurisdiction differs across wireline, cable, wireless and broadband?
 - Removal of *ex ante* regulation of prices, wholesale unbundling, terms and conditions, quality of service, reporting requirements
 - Substitution of *ex post* reliance on antitrust, competition law, consumer protection law, possibly adjudicated by the regulatory commission.

Regulation with Dependent Competitors



§ In economics, *benefits* from wholesale regulation are different:

- welfare effects are measured in the market for final goods.
- If wholesale regulation has no effect downstream, it has no benefits for consumers.

§ *Costs* of wholesale regulation are more complex:

- Induces distortions in retail markets because some platforms are regulated and others are not.
- Incentive effects are important because network investment is sunk and irreversible.



Intermodal Competition:

Cable

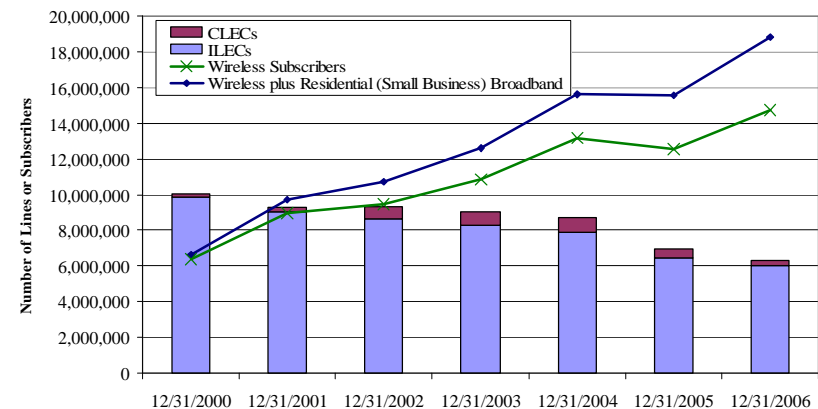
Wireless

Broadband / VoIP

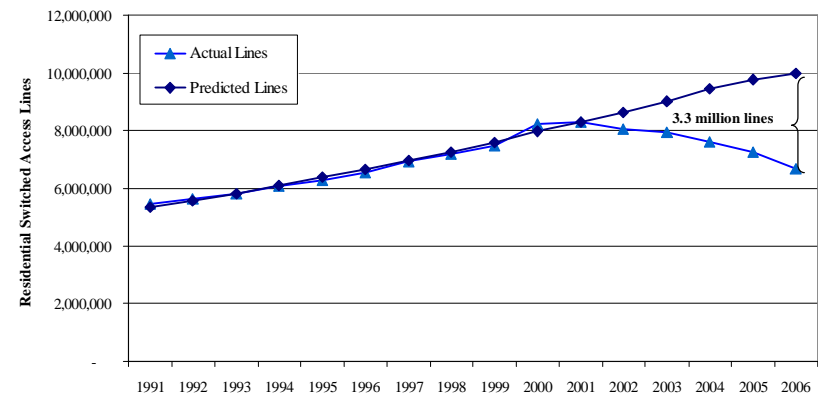
Wireline Subscription Florida



- § Year-end 2000: about 3.4 million more mass market (residence and small business) wireline access lines than total wireless subscribers and mass market high-speed broadband lines.
- § Year-end 2002: about 1.3 million *fewer* mass market wireline lines than total wireless subscribers and mass market broadband lines.
- § Year-end 2006: about 12 million *fewer* ILEC and CLEC mass market lines combined than total wireless and mass market broadband lines.
- § Trending residential access lines using the historical relationship with population suggests a more rapid reduction in wirelines.



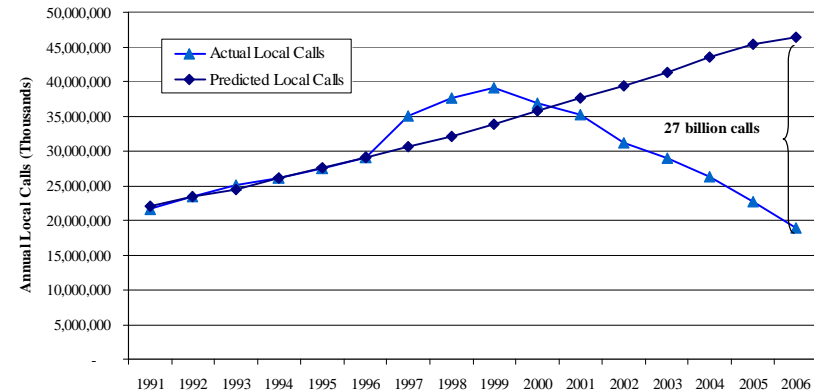
Note: Due to differences in reporting, 2005-2006 data are not comparable to previous.
Source: FCC December 2000-December 2006 Local Competition and High-Speed Internet Reports.



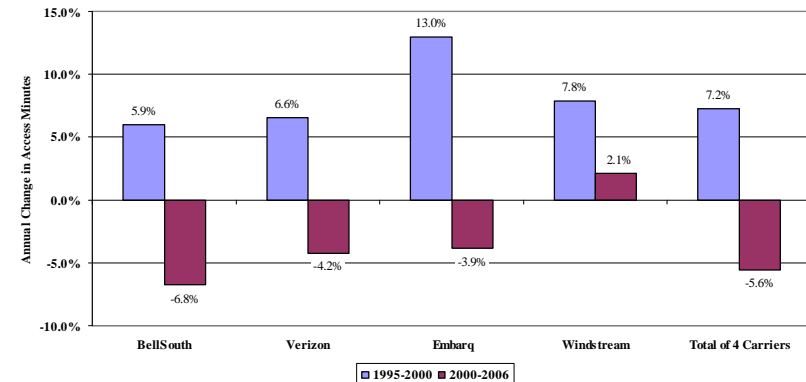
Wireline Usage Florida



§ A dramatic decline in expected wireline usage in Florida based on historical relationships with population.



§ A similar dramatic reduction in Florida wireline long distance usage, as measured by the average annual changes in switched access minutes 1995-2000 compared with 2000-2006.

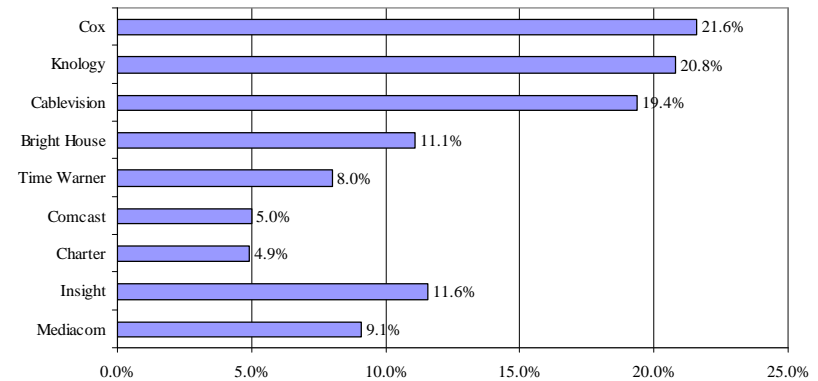


Source: FCC, National Exchange Carrier Association, Network Usage Data.

Cable Telephony U.S.

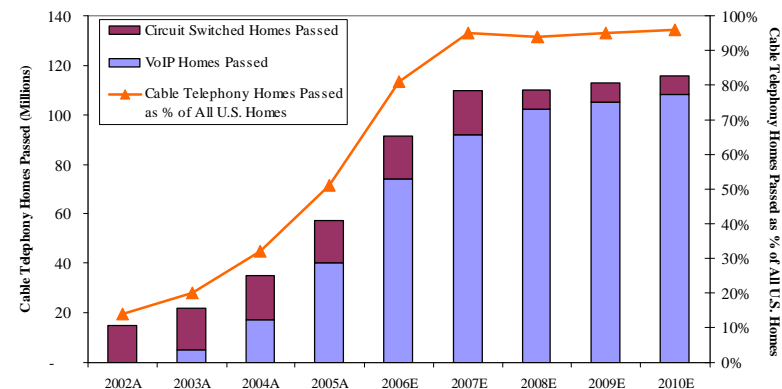


- § National penetration rates for cable telephony.
 - Data presented in chronological order of deployment (from top to bottom)
 - Penetration increases significantly with time.



Source: *VoIP Deployment & Strategies Update: Cable Operators*, Broadband Advisory Services, Pike & Fischer, July 2006, p. 3; Bright House Networks Press Release, *More than 225,000 Florida Families Switch to Bright House Networks Digital Phone: Now Announcing a Florida Unlimited Calling Plan*, May 2, 2006 and Table 1; Knology Inc, SEC, Form 10-Q, March 31, 2006, p. 12.

- § Cable telephony availability is forecasted to increase dramatically.

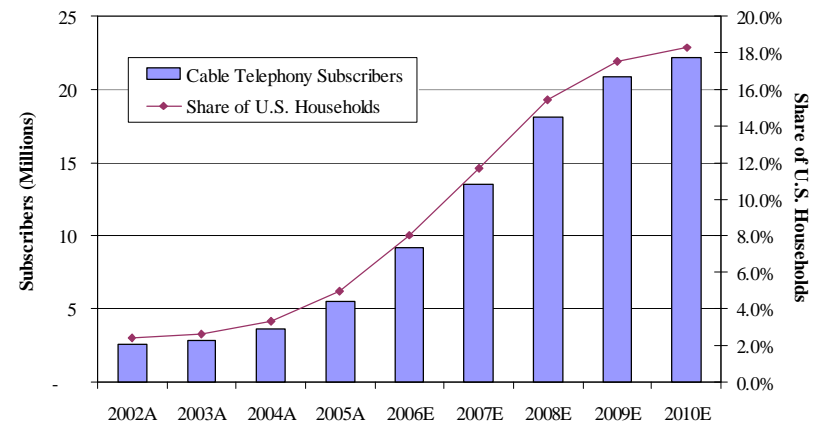
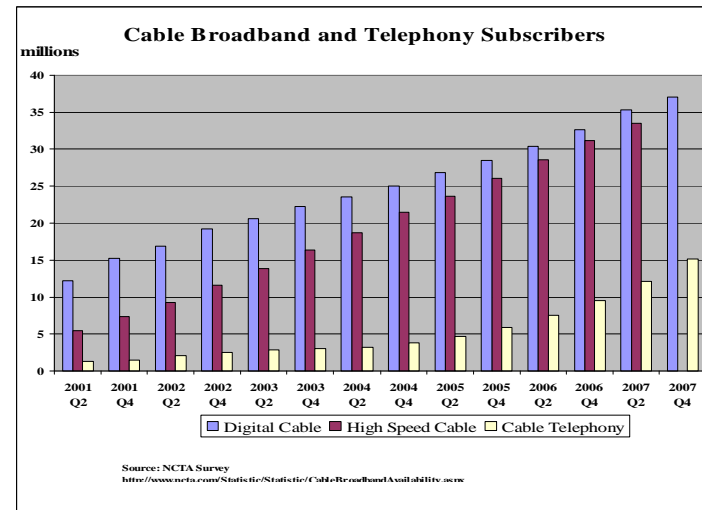


Source: J. Halpern, et al., Bernstein Research, *Quarterly VoIP Monitor: VoIP Growth Still Accelerating*, April 18, 2006, Exhibit 12.

Cable Telephony U.S.



- § Cable broadband growing rapidly
- § Cable telephone growing rapidly.
- § Cable telephony penetration is forecast to grow rapidly
- § But from a small base as a proportion of addressable households. Room for expansion.

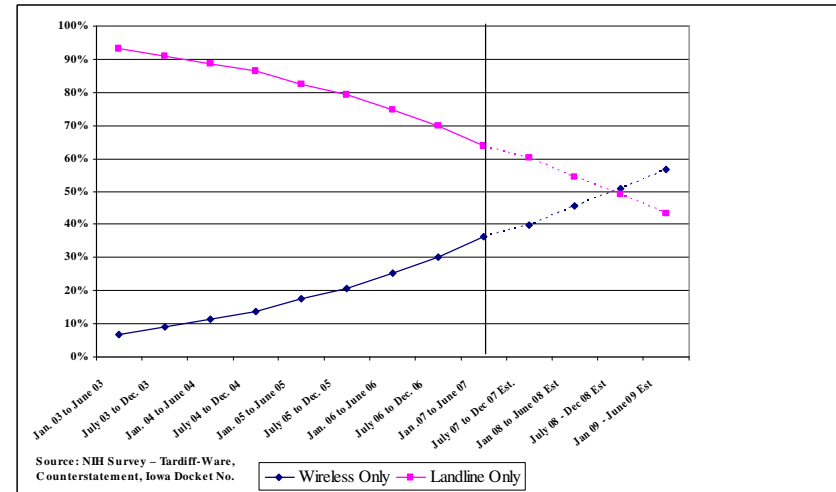


Source: J. Halpern, et al., Bernstein Research, *Quarterly VoIP Monitor: VoIP Growth Still Accelerating*, April 18, 2006, Exhibit 13.

Mobile Wireless U.S.

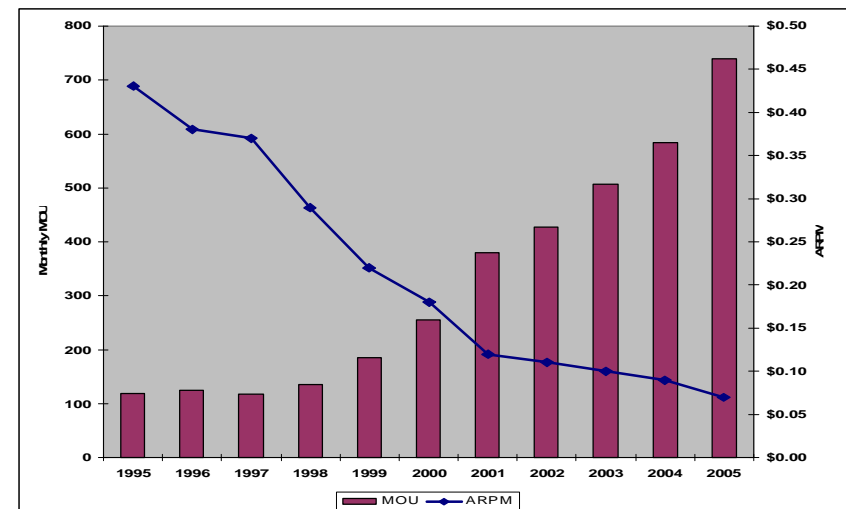


§ Wireless-only households are growing while wireline-only households are shrinking.



§ National penetration grown to 71% of the population and essentially 100% of the aged 20-49 population.

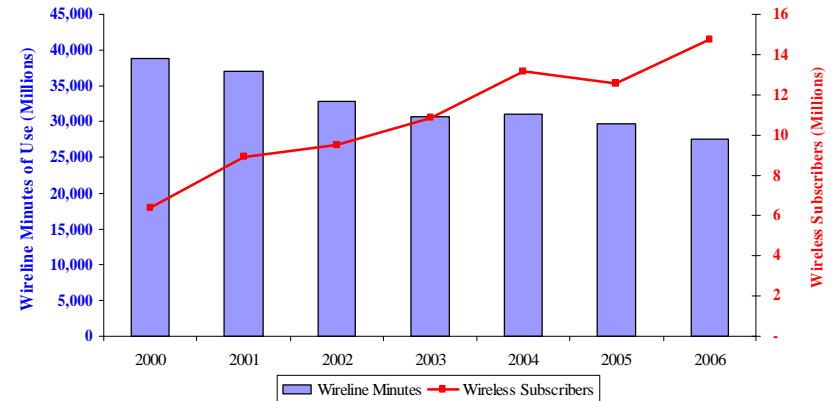
§ Dramatically lower prices and higher usage volumes.



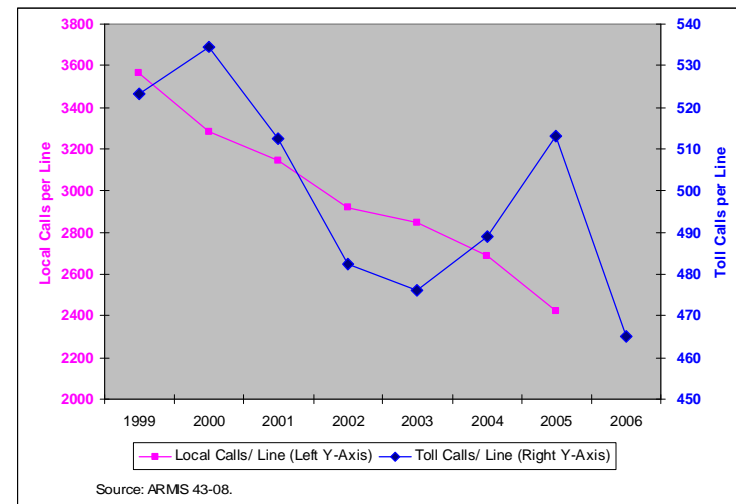
Mobile Wireless Florida



§ Wireless calls have displaced wireline local and toll minutes of use in Florida.



Note: Minutes of use are interstate switched access minutes for Florida ILECs.
Source: FCC, National Exchange Carrier Association, Quarterly Minutes of Use Data; FCC December 2006 Local Competition Report, Table 13.

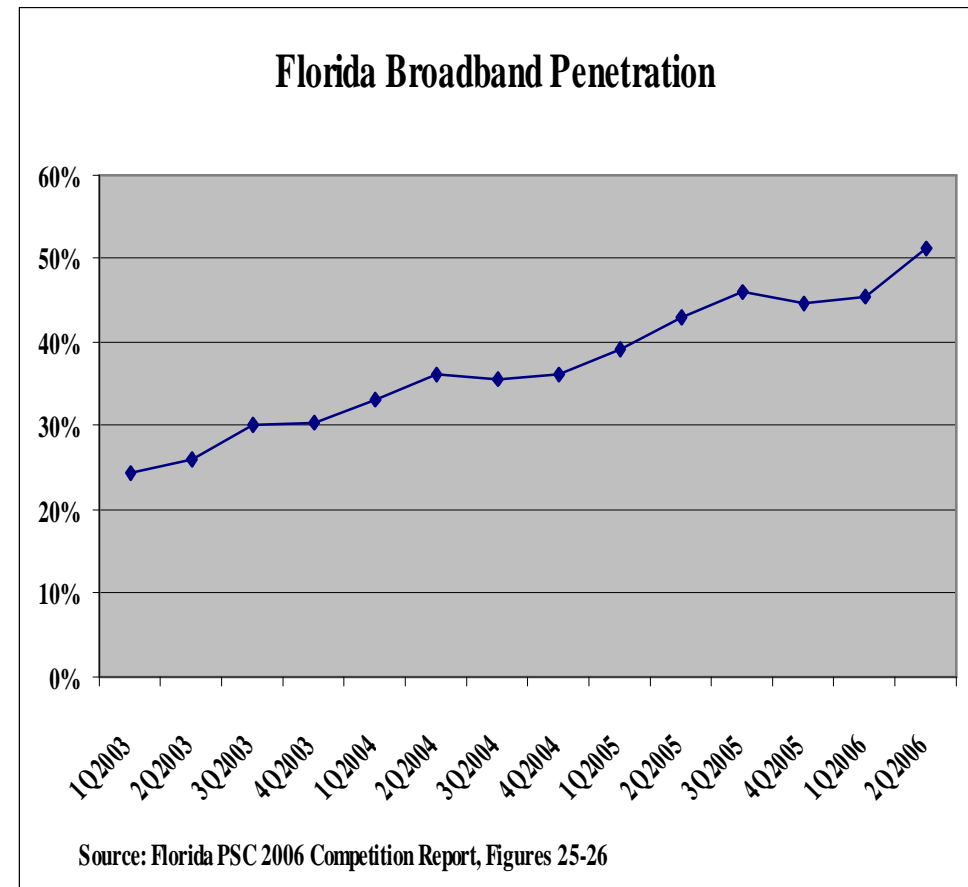


Source: ARMS 43-08.

Broadband and VoIP Florida



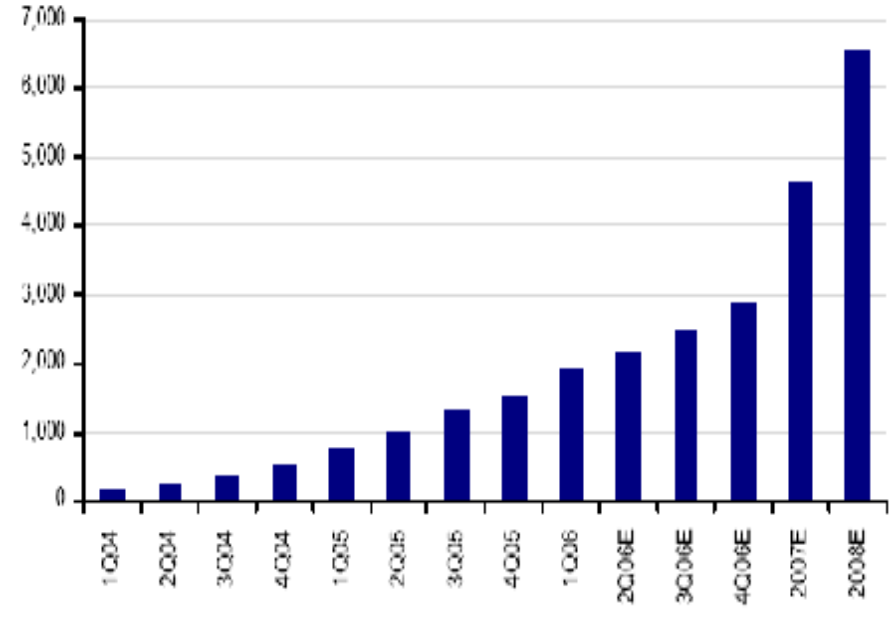
- § Internet penetration stable (71-73%) but dramatic shift from dial-up to broadband
- § Broadband penetration exceeds 50% of Florida households in 2Q2006
- § Florida broadband availability, December 2006:
 - 89% DSL availability (79% national)
 - 97% cable modem availability (96% national)



Broadband and VoIP U.S.



- § Rapid national growth in independent VoIP subscribers.
- § Package prices competitive with wireline / wireless packages.



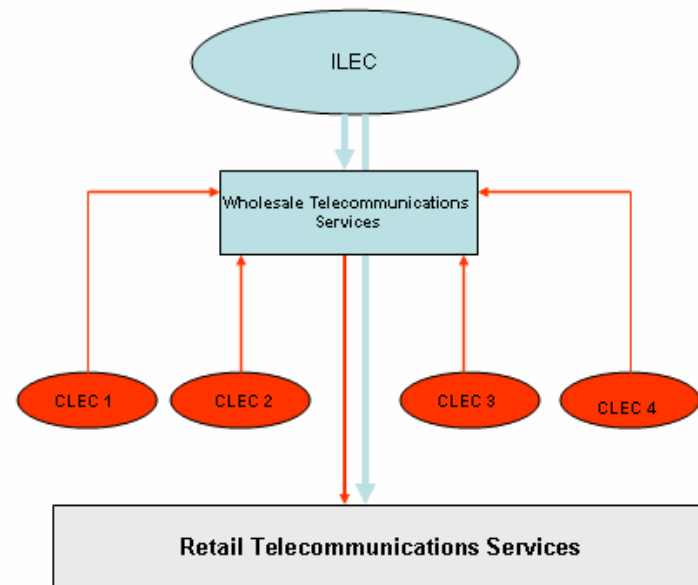
Note: Data includes Vonage, Prinus (Lingo), Packet8 and Coverd
Source: Company data and UDS estimates



Consequences for Regulation

Essential Facilities

- § Assume the retail market is competitive.
 - Assume all competitors are dependent on ILEC facilities.
 - The ILEC has the ability to exercise market power in the wholesale market.
 - Increase in the wholesale price passed through by all carriers
 - Hence extraction of additional profit from wholesale monopoly requires effective market power downstream.
- § Not unreasonable to regulate wholesale services when they meet the conditions for an essential facility.
 - May be more efficient methods than *ex ante* regulation.

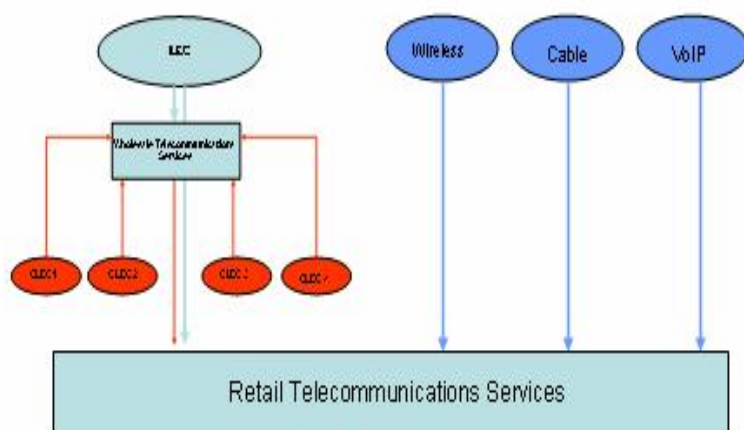


Regulation of Wholesale Services



Intermodal Competition

- § Assume the retail market is competitive and would be absent the dependent CLECs.
- § Even though the ILEC is (assumed to be) a monopoly supplier of the wholesale service, it would possess no market power.
 - Would have no ability to extract supracompetitive profits from dependent CLECs
 - Would have no incentive or ability to price wholesale services at an anticompetitive level (entailing a margin squeeze).



Regulation of Wholesale Services



§ Regulation of Wholesale Price is Unnecessary when Retail Market is Competitive:

- Assume:
 - Retail price is set in a competitive market.
 - Wholesale is essential facility.
 - ILEC chooses p_W to maximize profits, given p_R
- Theorem: p_W is a Ramsey mark-up of the ECPR wholesale price.
- As wholesale demand elasticity gets large, profit maximizing wholesale price approaches efficient level.
- Wholesale demand elasticity becomes large as intermodal alternatives become important.

$$p = \max_{p_R, p_W} [q_R(p_R, p_W)(p_R - c_R) + q_W(p_R, p_W)(p_W - c_W)]$$

$$p_W = \frac{h_W^W}{1 + h_W^W} [c_W + (p_R - c_R)]$$

$$\frac{h_W^W}{1 + h_W^W} \rightarrow 1 \quad p_W = c_W + (p_R - c_R)$$

Regulation of Wholesale Services



§ Intermodal Competition
Reduces the Profit-Maximizing Wholesale Price:

- Consider an increase in p_W .
- When a wholesale customer goes away, only α percent of the demand goes to ILEC retail.
- Effectively, wholesale is no longer an essential facility.
- Resulting profit-maximizing level of p_W is smaller.

$$\frac{\partial q_R}{\partial p_W} = -a \frac{\partial q_W}{\partial p_W} \quad 0 < a < 1$$

$$p_W = \frac{h_W^w}{1 + h_W^w} [c_W + a(p_R - c_R)]$$

$$\frac{h_W^w}{1 + h_W^w} \rightarrow 1 \quad p_W = [c_W + a(p_R - c_R)]$$

Regulation of Wholesale Services



Canadian Radio-television and
Telecommunications Commission

Conseil de la radiodiffusion et
des télécommunications canadiennes

Canada

- § Deregulation is different for wholesale and retail services.
 - ILEC with no wholesale competitors may have no wholesale market power.
 - Wireline CLECs may have no alternative methods of accessing their customers.
 - “Defining the relevant market for a wholesale facility” may not involve any substitute wholesale services.

Telecom Decision CRTC 2008-17

Ottawa, 3 March 2008

- § 37. With regard to future applications to consider the essentiality of a non-mandated service, the definition will read as follows: To be essential, a facility, function, or service must satisfy all of the following conditions:
 - § (i) The facility is required as an input by competitors to provide telecommunications services in a relevant downstream market;
 - § (ii) The facility is controlled by a firm that possesses upstream market power such that *denying* access to the facility would likely result in a substantial lessening or prevention of competition in the relevant downstream market; and
 - § (iii) It is not practical or feasible for competitors to duplicate the functionality of the facility.

- § 43. The Commission considers that determining duplicability is comparable to defining the relevant market for a wholesale facility in the sense that both exercises require the identification of potential substitutes, either through existing or potential alternatives.

Regulation of Wholesale Services



§ DOJ Merger Guidelines Market Definition

- Take loops. Start with narrow market definition – ILEC wireline loops.
- Consider whether cable, broadband or wireless loops are offered for wholesale use. No.
- Nonetheless, they compete indirectly with wireline wholesale loops through the retail market.
- A five percent increase in the price of ILEC wholesale loops would not induce entry into the supply of wholesale services.
- Nonetheless, such a price increase might not be profitable if it rendered CLEC customers non-competitive in the retail market.
- Hence the ILEC may be the only supplier in a conventionally-defined wholesale market and yet not have market power, conventionally defined, in that market.
- High market price elasticity even though there are no substitutes...



Conclusions

Conclusions



- § Ex ante economic regulation of both wholesale and retail services is generally unwarranted, inconsistent and rife with inefficient, unintended consequences.
 - Particularly, if retail market is effectively competitive
 - Platform parity possible using ex post regulation through the legal system.

- § Ex ante regulation of wholesale services is best confined to essential facilities. BUT:
 - We frequently don't know if a facility is essential at competitive market prices.
 - Facility may not be essential even though there are no substitutes.
 - Efficiency consequences of regulating some platforms but not others recalls the debacle of surface transport regulation: truck / rail / barge.
 - Ex post regulation through competition law avoids these costs.