developed with the concepts of *critical elasticity of demand* and/or *critical sales loss* at the center of such analysis. These concepts, in essence, evaluate whether two products are sufficiently similar as to be close substitutes in the eyes of the consumer, and close enough to make a "small but significant and nontransitory increase in price" ("SSNIP") unprofitable.[8] In other words, *the question is not whether or not two products or services may be substitutes to some degree or to some consumers. Rather, the relevant question is whether or not the two products or services are sufficiently good substitutes to make a small but significant and nontransitory increase in price unprofitable.*

As the MERGER GUIDELINES explain:

> A market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm ... likely would impose at least a "small but significant and non-transitory" increase in price, assuming the terms of sale of all other products are held constant. A relevant market is a group of products and a geographic area that is no bigger than necessary to satisfy this test.[9]

In practice, delineating a market involves adding groups of products (or geographic markets) to the portfolio of the hypothetical monopolists and asking whether or not a hypothetical monopolist with this product portfolio could profitable impose a SSNIP. Obviously, the ability to profitable impose a SSNIP depends on the sensitivity of purchases to price changes

Prior to defining the critical elasticity of demand and critical sales loss, a simple example of what these tools seek to measure may be helpful. Say a firm produces a product with unit variable cost $5 and sells 100 units of this product for $10 each. The firm's profits are $500 [= (10 - 5)·100]. Now, the firm contemplates a price increase of 5% to a new price of $10.50. Will this price increase be profitable? The new profit margin is $5.50 per unit, so as long as the firm sells 91 units, its profits will rise [(10.50 - 5)·91 = 500.5].[10] If sales fall to 90 units or less, then the price increase is unprofitable.[11] Thus, the profitability of a price increase depends on the

---

8 *See, e.g.*, G. J. Werden, *The History of Antitrust Market Delineation*, 76 MARQUETTE LAW REVIEW 123-215 (1992); D. R. Kamerschen, *Testing for Antitrust Market Definition Under Federal Government Guidelines*, 4 JOURNAL OF LEGAL ECONOMICS 1-10 (1994); G. J. Werden, *Demand Elasticities in Antitrust Analysis*, 66 ANTITRUST L.J. 363, 387-96 (1998); P. Massey, *Market Definition and Market Power in Competition Analysis: Some Practical Issues*, 31 THE ECONOMIC AND SOCIAL REVIEW 309-328 (2000); *Times-Picayune Publishing Co. v. United States*, 345 US 594 (1952).

9 1992 DEPARTMENT OF JUSTICE/FEDERAL TRADE COMMISSION HORIZONTAL MERGER GUIDELINES ("MERGER GUIDELINES") § 1.0 (http://www.usdoj.gov/atr/public/guidelines/horiz_book/toc.html).

10 Incremental unit costs are assumed to be constant in the relevant range of output.

11 In a perfectly competitive market, sales would fall to zero.

response of sales to price changes, and this response is measured by the own-price elasticity of demand. The critical elasticity of demand and critical sales loss provide the threshold levels of the quantity response making a given price increase unprofitable.

A. *Critical Elasticity of Demand*

The own-price elasticity of demand is a measure of how sales change when price changes and is computed as the percentage change in quantity sold divided by the percentage change in price. With knowledge of the elasticity, it is possible to measure how much sales fall when a SSNIP is imposed and, by appealing to economic theory, whether or not this sales loss is sufficient to make the SSNIP unprofitable. The profitability of a SSNIP can be evaluated using the concept of the critical elasticity of demand.

The critical elasticity of demand is the largest pre-merger elasticity of demand a hypothetical monopolist could face and still want to raise price by at least the threshold amount (typically 5%). For linear demand and a threshold price increase of t, the critical own-price elasticity of demand (in absolute value)[12]

$$\text{Critical Elasticity of Demand} = \bar{\varepsilon} = \frac{1}{m + 2t} \tag{1}$$

where m is the margin of price over variable costs.[13] If the actual, econometrically-estimated own-price elasticity of demand (ε) faced by the monopolist is less than the critical elasticity, then a SSNIP is profitable. For example, let m be 0.40 and t be 0.05 (a 5% price increase threshold), such that the critical elasticity is 2.0 [= 1/(0.4 + 0.1)]. If econometric studies indicate the pre-merger own-price elasticity of demand for this market is 1.5, then a hypothetical monopolist could raise price profitably by 5% (*i.e.*, the pre-merger elasticity is smaller than the critical elasticity, $\varepsilon < \bar{\varepsilon}$).[14] Alternately, if the econometrically estimated demand elasticity is 3.0,

---

[12] Own-price elasticities of demand are negative, by definition. However, they are often expressed as positive values (absolute values) for expositional purposes.

[13] Werden, *Demand Elasticities, supra* n. 8. If p is price and c is marginal cost, the price-cost margin is $(p - c)/p$. Margins are typically computed using accounting data and, as a consequence, are subject to disputes. G. Werden and L. Froeb, CALIBRATED ECONOMIC MODELS ADD FOCUS, ACCURACY, AND PERSUASIVENESS TO MERGER ANALYSIS IN THE PROS AND CONS OF MERGER CONTROL (edited by the Swedish Competition Authority, Swedish Competition Authority, Stockholm 2002).

[14] According to the actual elasticity, the 5% price increase will result in a 7.5% reduction in sales. However, a price increase is profitable as long as sales do not decline by more than 10%.

the hypothetical monopolist would not raise price because the increase would be unprofitable (*i.e.*, the demand response is too large, $\varepsilon > \bar{\varepsilon}$).[15]

Importantly, a monopolist would always price in the elastic region of demand ($\varepsilon \geq 1.0$), so any own-price elasticity of demand less than 1.0 would fall below the critical demand elasticity. In other words, regardless of m, if the own-price elasticity of demand is less than 1.0, then the hypothetical monopolist will raise price by 5% and the services offered by the hypothetical monopolist are a "market." This fact may be useful, since if the own-price elasticity of demand is found to be less than 1.0, then assumptions regarding the margin (m), which can be controversial, are irrelevant to market delineation.[16]

B. *Critical Sales Loss*

Closely related to the critical elasticity of demand is the concept of *critical sales loss*. The critical sales loss is the maximal percentage of sales that can be lost for the SSNIP to be profitable. For linear demand and a threshold price increase of t, the critical sales loss is

$$\text{Critical Share Loss} = \bar{s} = \frac{t}{m + 2t}. \tag{2}$$

From our earlier example (m = 0.40 and t = 0.05), the critical sales loss is 10% [= 0.1/(0.4 + 0.1)]. If analysts believe a 5% price increase for a product will result in less than a 10% sales loss for that product, then that product is in its own market. If the percent sales loss were expected to exceed 10%, then a market including just that product would be too narrowly defined. The relationship between the critical elasticity of demand and critical sales loss should be apparent (*i.e.*, they are two sides of the same coin).

C. *Delineating the Market for Residential Second Lines*

Our analysis of intermodal competition between wireline and mobile telephony focuses on *residential second* lines. This choice is based on a number of factors. First, published estimates of the own-price elasticity of second lines estimated with the price of wireless services in the regression are available.[17] Second, according to some, second lines are at most risk of

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15 Under this scenario, the 5% price increase will result in a 15% reduction in sales. As before, however, a price increase is profitable only as long as sales do not decline by more than 10%.

16 Werden and Froeb, *Calibrated Models*, *supra* n. 13 at 4.

17 M. Rodini, M. Ward and G Woroch, *Going Mobile: Substitutability Between Fixed And Mobile Access*, 27 TELECOMMUNICATIONS POLICY 457-476 (2003).

substitution to wireless services (certainly more so than primary lines).[18] The logic is somewhat appealing: with a mobile phone in the household there remains an alternate communication method if the primary wireline phone is tied up (say, by a teenager or internet connection). Further, keeping the primary wireline phone affords the quality and security of wireline telecommunications. Third, econometric studies consistently show that the own-price elasticity of demand is larger for second than primary lines.[19] These latter criteria bias our analysis toward a finding of intermodal competition, since we evaluate the wireline service for which wireless service is a "better" substitute. If we fail to find evidence of effective intermodal competition for residential second lines, then it is clear that there is no effective intermodal competition for primary lines. However, the inverse is not true – intermodal competition for residential second lines does not imply intermodal competition for primary lines.

Mark Rodini, Michael Ward, and Glenn Woroch (2003) provide the most recent econometric estimate of the own-price elasticity of demand for residential second lines.[20] Their analysis focused explicitly on substitution between wireline and mobile telephony, so their estimates are most relevant to our computations. While their own-price elasticity estimates are generally larger than earlier studies, they are consistent with previous findings.[21] Their estimated elasticities are based on a sample of over 90,000 households including, primarily, data from the TNS Telecoms ReQuest Market Monitor. Rodini *et al.* (2003) report an own-price elasticity of demand for residential second lines of -0.62, which is highly statistically significant (better than the 1% level). While mobile prices were included in the regression, the cross-price elasticities were not different from zero.

Based on an analysis of various sources, the margin of wireline service over variable costs (m) is assumed to be 50%.[22] From Equations (1) and (2), the critical demand elasticity for a 5%

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18 *Id.*

19 *Id. See also,* James Eisner, and Tracy Waldon (2001) *The Demand for Bandwidth: Second Telephone Lines and On-Line Services,* 13 INFORMATION ECONOMICS & POLICY 301-309 (2001) (elasticity = -0.35); Duffy-Deno, Kevin (2001) *Demand for Additional Telephone Lines: An Empirical Note,* 13 INFORMATION ECONOMICS & POLICY 283-299 (2001) (elasticity = -0.59); D. Lynn Solvason, *Cross-sectional Analysis of Residential Telephone Subscription in Canada using 1994 Data,* 9 INFORMATION ECONOMICS & POLICY 241-264 (1997) (elasticity = -0.48). Primary own-price elasticities are estimated to be well below 0.10. R. Crandall and L. Waverman, *Who Pays for Universal Service? When Telephone Subsidies Become Transparent* (2000) at Table 5-1: http://www.brookings.org/press/books/universal_service.htm.

20 Rodini, *supra* n. 17.

21 *Supra* n. 19.

22 The margin is derived by reviewing the following documents: a) the financial filings of the BOCs; b) SBC Ex Parte, CC Docket No. 01-338 (Oct. 11, 2002; Oct 30, 2002); c) T. R. Beard and C. C. Klein, *Bell Companies as Profitable Wholesale Firms: The Financial Implications of UNE-P,* PHOENIX CENTER POLICY PAPER NO. 17 (November 2002) (http://www.phoenix-center.org/pcpp/PCPP17Final.pdf); and d) T. R. Beard, G. S. Ford, and C. C. Klein, *The*

(Footnote Continued....)

price increase is 1.67 (= $\bar{\varepsilon}$) and the critical sales loss is 8.3% (= $\bar{s}$). To determine whether residential second lines and mobile telephony are in the "same market" or are "intermodal competitors" we need to compare these values to those implied by the own-price elasticity of demand. Table 1 summarizes these comparisons for a variety of assumed margins.

Table 1. Summary of Intermodal Competition Test for Wireless and Residential Second Lines (Price Increase = t = 5%).

Margin m	Critical Elasticity $\bar{\varepsilon}$	Actual Elasticity ε	Critical Sales Loss $\bar{s}$	Actual Sales Loss s	Effective Intermodal Competition (Yes/No)
0.40	2.00	0.62	0.100	0.03	No
0.50	1.67	0.62	0.083	0.03	No
0.60	1.43	0.62	0.071	0.03	No
0.70	1.25	0.62	0.063	0.03	No

First, we observe that at a 50% margin (m) the actual own-price elasticity of demand is less than the critical demand elasticity (0.62 < 1.67). The implication is that a SSNIP would be profitable, despite the potential substitution with mobile telephony. Consequently, residential second lines and mobile telephony are not effective intermodal competitors. Note that this is not to say that the two cannot, in some instances, operate as substitutes. While possible substitutes in some instances, the substitution is not sufficient to constrain market power in the provision of residential second lines. Also observe that the own-price elasticity of demand for second lines is below 1.0. As discussed earlier, this fact alone is sufficient to declare residential second lines as a market separate from mobile telephony.

Second, the critical sales loss is 8.3%, which may seem small. Critical sales loss is always small when margins are large (in this case, 50%). However, large margins are typically the consequence of highly inelastic demand curves, and that is true in this case. For the 5% price increase, the expected loss in sales is only 3%, which is well below the critical sales loss of 8.3%. Again, the analysis suggests that a SSNIP would be profitable to a hypothetical monopolist of residential second lines and, consequently, that wireline and wireless telephone services are not effective intermodal competitors.

As shown in Table 1, effective intermodal competition is rejected regardless of the assumed margin. For example, at a margin of 60%, the critical elasticity is 1.4 and the critical sales loss is

Financial Implications of the UNE-Platform: A Review of the Evidence, Forthcoming in COMMLAW CONSPECTUS (2004). We include capital costs as variable costs for the 50% margin. Excluding capital costs increases the margin to about 60% (we provide results later in the text for this margin). These margins are based on variable costs. If fixed costs are sufficiently large, the service may be unprofitable overall.

7.1.[23] The conclusions drawn when using these alternate margins are no different than before. Further, the assumption regarding the margin is not very important since the own-price elasticity of demand is less than unity. We find no evidence for effective intermodal competition.

III. The Effect of Industry Structure on Intermodal Competition

Industry structure in the mobile telephony industry also abates the potential for meaningful intermodal competition. Wireless carriers Verizon, Sprint, and Cingular (owned by BellSouth 40% and SBC Communications 60%) are each owned by wireline monopolists and collectively hold about a 63% market share of the national domestic wireless market.[24] If Cingular's $41 billion acquisition of AT&T Wireless[25] is successful, then the incumbent wireline carriers will service about 82% of wireless subscribers.[26] Thus, even if wireless is an intermodal competitor, then the effects of competition are substantially internalized to the incumbent wireline carriers (and consequently eliminated). In other words, the incumbent wireline carriers have about an 82% probability of capturing any customer canceling wireline service for wireless service. As put forth eloquently by BellSouth CEO and Chairman Duane Ackerman, "Wireless substitution is now a fact. That's okay. We tend to own both."[27]

Also important is the fact that the joint-ownership of substitute goods gives the firms an incentive to raise the price of both goods, since a higher price for a product raises the demand for its substitutes.[28] Consequently, not only does the joint ownership of wireline and wireless

---

[23] *Id.*

[24] iViewResearch , *iViewResearch e-Business Statistics Report*, May 2, 2002 (p. 5) (market share of subscribers are Verizon Wireless 29.4%, Cingular 19.8%, AT&T Wireless 18.9%, Sprint PCS 13.4%, Nextel 9.6%, and T-Mobile 9.0%).

[25] Tom Giles and Angus Whitley, *Cingular Parents to Buy AT&T Wireless for $41 Billion*, BLOOMBERG NEWS (17 February 2004).

[26] The BOCs' share alone (excluding Sprint), after the Cingular acquisition, will be over 70%. *See, e.g.*, Jennifer Mears, *Wireless carrier market prime for consolidation*, NETWORK WORLD (September 2, 2002); Peter J. Howe, *New Chief Executive of Sprint PCS Discusses Need for Industry Consolidation*, THE BOSTON GLOBE (November 11, 2002).

[27] *More Callers Cut off Second Phone Lines for Cellphones, Cable Modems*, WALL STREET JOURNAL B1 (November 15 2001) (quoting Duane Ackerman); *see also A Wireless World*, BUSINESS WEEK (October 20, 2003) (quoting SBC president Ed Whitacre as conceding that wireless is "not going to displace the wireline network. It's certainly going to be a big product, but it's never going to be the substitute. Reliability is one reason.").

[28] J. Tirole, THE THEORY OF INDUSTRIAL ORGANIZATION (1995) at 70. *See also* PHOENIX CENTER POLICY BULLETIN No. 11, *Higher Prices Expected from the Cingular/AT&T Wireless Merger* (forthcoming Spring 2004) (showing that wireless rates are likely to rise as the result of the proposed acquisition of AT&T Wireless by Cingular Wireless). In addition to the cross-service ownership, high concentration in both the wireline and wireless industries facilitates such "collusive" pricing across the two services.

services reduce the potential for intermodal competition, but it provides an incentive to raise the price of both services.[29] *In light of the existing and emerging industry structure in wireline and wireless telephone services, perhaps intermodal collusion rather than intermodal competition is a more accurate description of how the two services are related.* [30]

IV. Conclusion

Using the standard tools of market definition from antitrust economics and academic empirical work on wireline and wireless services, we conclude that wireline service is a market unto itself and mobile telephony does not, today, offer an effective constraint on market power in the wireline industry. In other words, economic analysis suggests that a hypothetical wireline monopoly could impose a "small but significant and non-transitory increase in price." We are able to reach this conclusion despite limiting our analysis to the wireline service many believe faces the greatest risk of substitution with mobile telephony (*i.e.*, residential second lines). Thus, we confidently conclude that wireless is not an effective intermodal competitor for wireline telephone services.

Our finding is consistent with that of the FCC in its recent *Triennial Review Order*, where the agency concluded that:

> ... despite evidence demonstrating that narrowband local services are widely available through CMRS providers, wireless is not yet a suitable substitute for local circuit switching. In particular, only about three to five percent of CMRS subscribers use their service as a replacement for primary fixed voice wireline service, which indicates that wireless switches do not yet act broadly as an intermodal replacement for traditional wireline circuit switches. Lastly, the record demonstrates that wireless CMRS connections in general do not yet equal

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[29] Equally as important, not only will the BOCs resist cannibalizing their wireline services, but the repeated interactions among few firms increases the potential for collusion. *See* B. D. Bernheim and M. D. Whinston, *Multimarket Contact and Collusive Behavior*, 21 RAND JOURNAL OF ECONOMICS 1990: 1-26; P. Parker and L. Roller, *Collusive Conduct in Duopolies: Multimarket Contact and Cross-Ownership in the Mobile Telephony Industry*" CEPR DISCUSSION PAPER 989 (1994); J. Scott, *Multimarket Contact Among Diversified Oligopolists* 9 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 1991: 225-238.

[30] As shown by Tirole, *supra* n. 28, joint ownership of the substitute goods leads to a conscious increase in the price(s) of the service(s). To the extent they are substitutes, therefore, joint ownership of wireless and wireline services leads to explicit collusion.

> traditional landline facilities in their quality and their ability to handle data traffic.[31]

We hope that the FCC's sentiment expressed here and the findings in this POLICY BULLETIN will redirect the attention of regulators now relying on intermodal competition to produce benefits for consumers toward more efficacious policies aimed at improving competition in the wireline industry.

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[31] *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers* (CC Docket No. 01-338), *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996* (CC Docket No. 96-98), and *Deployment of Wireline Services Offering Advanced Telecommunications Capability* (CC Docket No. 98-147), Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, FCC 03-36, ___ FCC Rcd ___ (rel. 21 August 2003) at ¶ 445; *see also*, the FCC's EIGHTH CMRS REPORT, where although the FCC recognized that wireless traffic (and corresponding revenues) continued to increase, the FCC still found that "only a small percent of wireless customers use their wireless phones as their only phone, and that relatively few wireless customers have "cut the cord" in the sense of canceling their subscription to wireline telephone service." *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Eighth Report (rel. July 14, 2003) at ¶ 102 (http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-150A1.pdf).

EXHIBIT 5

The Pace Coalition, et al.
October 4, 2004
Exhibit 5

A Survey of Small Businesses' Telecommunications Use and Spending

by

by Stephen B. Pociask,
TeleNomic Research, LLC

for

under contract number SBA-HQ-02-M-0493

Release Date: March 2004

The statements, findings, conclusions, and recommendations found in this study are those of the authors and do not necessarily reflect the views of the Office of Advocacy, the United States Small Business Administration, or the United States Government.

A Survey of Small Businesses' Telecommunications Use and Spending

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Using all of the survey responses, **Section IV** has analyzed the composition of telecommunications expenditures for major industries and identified industries that spend extensive amounts for telecommunications services. **Appendix B** recompiles **Figures 15 to 29** and compares industry expenditures for each telecommunications service. The section to follow will make similar analyses, but focus only the subset of firms subscribing to specific telecommunications services.

V. Market Penetration and Usage

Until now, this report has provided results showing the composition of spending by the small business market segment in terms of various characteristics, such as business size and industry classification. While these reports are useful in showing the total spending of small businesses and the relative importance of telecommunications services for these various characteristics, these tables do not reveal the spending patterns of only those small businesses subscribing to and paying for a particular telecommunication service. For example, according to the sample results, most small businesses subscribe to local and long distance services (390 firms), while only a dozen firms actually subscribe to T-1 services. As a result, T-1 service has a relatively small share of spending in the overall small business segment. However, for those small businesses using the service, T-1 spending represents a major purchase and a considerable part of their telecommunications needs. For this reason, this section is devoted to understanding the telecommunications use and expenditures for only those small businesses that subscribe to a particular service. Unlike the analysis of composition of expenditures, however, the telecommunications services listed in the tables cannot be summed to an industry or subgroup total.

A. Telecommunications Services Penetration Rates

A common way of understanding the degree to which small businesses utilize telecommunications services is to measure the services *penetration rate*. For any particular service, the service penetration rate is measured as the ratio of the number of subscribing firms to the total number of firms in the population. Because survey participants identified which services they use, how much they use and how much they spend, results from the survey can be used to calculate penetration rates for each telecommunications service.

Wired telephone services, specifically local telephone services, are used by 98% of small business, a figure slightly higher than the 96% penetration in the residential market.[22] Wireless telephone services are used by 73% of small businesses, a rather interesting statistic for a service that was first introduced to the market only twenty years ago. However, pagers are used by only 6% of small businesses, and may have become a casualty of wireless telephony's success.

[22] "Telephone Subscribership in the United States," Industry Analysis and Technology Division, FCC, November 2002, Table 1, p. 5. The data for March 3003 was 95.5.

As for Internet and data services, overall, the penetration rates for these services are much lower than traditional wired telephone and wireless telephone services. According to the sample results, Internet dialup services are used by 38% of the small businesses survey. High-speed services are led by cable modem services (26%) and by Digital Subscriber Line (DSL) services (21%). Other high-speed alternatives, satellite (4%) and wireless broadband (3%) have very low penetration rates. T-1 data services are more popular with larger businesses, and, therefore, are only subscribed to by 4% of the small businesses in the survey. In summary, Internet services, particularly high-speed services, are not widely used by small businesses, for reasons not explicitly clear from the survey results. The possible reasons for these low service penetration rates may be due to price, consumer preferences, service availability and the nature of the small business. **Figure 30** (below) summarizes the penetration rates for major telecommunications services and indicates a substantial variation in penetration rates across telecommunications services.

Figure 30: Penetration Rates for Telecommunications Services Used by Small Businesses

Service	N	Users Only	Penetration Rate
Wired Telephone	408	399	98%
Wireless Telephone	397	299	73%
Pagers	420	27	6%
Cable Modems	418	109	26%
Satellite	424	16	4%
DSL	422	87	21%
Wireless Broadband	423	12	3%
Dial-Up Internet Access	418	158	38%
T-1	424	17	4%

B. Expenditures of Users of Telecommunications Services

Section IV of this report averages data across all small businesses in the survey, whether these businesses subscribe to a telecommunications service or not. Because of the large differences in penetration rates between services, eliminating those businesses that do not use a particular telecommunications service can provide some interesting insights into the expenditures for telecommunications by small business subscribers (labeled in **Figure 30** as *users only*).

For example, **Figure 31** (on page 45) shows the results of only those firms subscribing a telecommunications service, and indicates that wireless services ($239.37 per month) are the single biggest expense for small businesses, followed by local telephone ($185.88 per month) and long distance services ($155.39 per month). Small business subscribers pay

about twice as much for high-speed services than they do for dialup services. Among the high-speed services, cable modem service expenditures are less, which may reflect lower priced cable modem services and explain, in part, why these penetration rates are higher than other services. This point will be investigated further in the next section, which analyzes telecommunications service prices using a measure of expenditures per unit.

Figure 31: Average Monthly Expenditure of Small Businesses That Use and Pay For a Specific Telecommunications Service

Service	N	Only Firms Using Services
Local Telephone Services	272	$ 185.88
Long Distance Services	275	$ 155.39
Local and Long distance (Added)	275	$ 341.27
Local and Long distance (Combined)	390	$ 314.52
Mobile (Wireless and PCS)	300	$ 239.37
Pager and Beepers	30	$ 65.20
Cable Modem Services	83	$ 53.38
Satellite (High-speed)	13	$ 68.07
DSL Services	69	$ 67.84
Wireless Broadband	8	$ 58.75
Dial-up Internet Services	147	$ 31.88
T-1 Services	12	$ 559.61
Other Services	4	$ 77.00

EXHIBIT 6

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WHITACRE: END ECONOMIC REGULATION OR FORGO FIBER-OPTIC, IP INNOVATIONS

Suggesting that the wrong regulatory policies will stall his company's plans for pushing fiber to the network edge, SBC Communications, Inc., Chairman and Chief Executive Officer Edward E. Whitacre Jr. told a group of state regulatory commissioners yesterday evening that the romise of fiber-rich networks and Internet protocol (IP) technologies "will remain just out of reach" unless changes are made in the way the ndustry is regulated.

Speaking at the D.C. Summit of the Federation for Economically Rational Utility Policy, Mr. Whitacre said, "The rationale for economic egulation [of the telecom industry] has run its course." FERUP, whose members have distanced themselves from the National Association of Regulatory Utility Commissioners over their espousal of deregulation and federal preemption of state jurisdiction, represents the hope for the ndustry's future, he added.

Few things are going to be more important than regulatory policy in determining how fast SBC will move on its recently announced plans to pend up to $6 billion on fiber facilities over the next five years, Mr. Whitacre said. "Companies like SBC that are willing to make billion-dollar nvestments should not have to make our networks available to those who are willing to stand by and let us do the heavy lifting."

In addition to making broadband services more widely available, investment in fiber facilities would help equipment manufacturers - "some of he companies hurt most" by the telecom industry's downturn - Mr. Whitacre said. It would also create jobs, "prime the pump for innovation," and be the "salvation" of telecom research and development, he added. "We're number 10" in global broadband subscribership is not a campaign slogan that's going to win any votes, he said. - Lynn Stanton, lstanton@tr.com

TR Daily, September 15, 2004

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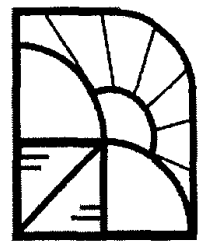

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Phoenix Center Policy Paper Number 19:

The Positive Effects of Unbundling on Broadband Deployment

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Abstract: This POLICY PAPER examines whether there is a relationship between regulated rates for "unbundled local loops" and deployment of broadband technology by incumbents and entrants. Using an econometric model that analyzes 2002 and 2003 local loop rates and takes into account price variability and other factors that may impact broadband deployment, this POLICY PAPER finds that unbundled loop prices based on Total Element Long Run Incremental Cost ("TELRIC") are associated with *increased availability* of broadband services and increased availability of *competitive* broadband services (four or more providers). As a result, this POLICY PAPER concludes that current policies which are hostile to the market-opening provisions of the 1996 Act will actually make it harder to achieve President Bush's stated goal of "universal, affordable access for broadband technology by 2007" and will, instead, lead to greater economic concentration and incumbent market power in the industry as firms are forced to exit the market.

I. Introduction

Ever since the passage of the Telecommunications Act of 1996, the incumbent Bell monopolies have argued that the 1996 Act's wholesale network access policies (like unbundling) dampen or decrease their incentive to deploy

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broadband technology. Despite significant empirical evidence to the contrary,[1] none in support,[2] and a specific Supreme Court finding that this argument "founders on fact",[3] this canard has nonetheless found welcome ears with many of the Bush Administration's telecom lieutenants.[4] Indeed, the Bush

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[1] Research has already conclusively proved that the competition produced by the market-opening provisions of the 1996 Act increased the incumbent Bell companies' average net CapEx investment by $759 per year, or about 6.4% per year in the aggregate, for each UNE-P access line. PHOENIX CENTER POLICY BULLETIN NO. 5, *Competition and Bell Company Investment in Telecommunications Plant: The Effects of UNE-P* (17 September 2003) (http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin5.pdf). *See also*, PHOENIX CENTER POLICY BULLETIN NO. 6: *UNE-P Drives Bell Investment - A Synthesis Model* (17 September 2003) (available at: http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin6Final.pdf); G. S. Ford and M. D. Pelcovits, *Unbundling and Facilities-Based Entry by CLECs: Two Empirical Tests* (July 2002): www.telepolicy.com; T. R. Beard, R. B. Ekelund Jr., and G.S. Ford, *Pursuing Competition in Local Telephony: The Law and Economics of Unbundling and Impairment* (November 2002)(www.telepolicy.com); T. R. Beard, G. S. Ford, and T.M. Koutsky, *Mandated Access and the Make-or-Buy Decision: The Case of Local Telecommunications Competition* (December 2002) (www.telepolicy.com); R. D. Willig, W. H. Lehr, J. P. Bigelow, and S. B. Levinson, *Stimulating Investment and the Telecommunications Act of 1996*, Unpublished Manuscript (October 2002); K A. Hassett and L. J. Kotlikoff, *The Role of Competition in Stimulating Telecom Investment*, AEI PUBLICATION (October 2, 2002) (www.aei.org/publications/pubID.14873/pub_detail.asp). Hassett *et al.* (2002) perform a simulation rather than using actual data. *See also, Does Unbundling Really Discourage Facilities-Based Entry? An Econometric Examination of the Unbundled Local Switching Restriction*, Z-TEL POLICY PAPER NO. 4 (February 2002)(www.telepolicy.com); *Competition at the Crossroads: Can Public Utility Commissions Save Local Telephone Competition?*, Consumer Federation of America (October 2003) (http://www.consumerfed.org/pr10.07.03.html).

[2] R. B. Ekelund Jr. and G. S. Ford, *Innovation, Investment, and Unbundling: An Empirical Update*, 20 YALE JOURNAL ON REGULATION 383-388 (2003); G. S. Ford, *Do Unbundling Policies Discourage CLEC Facilities-Based Investment?* (Commenting on R. W. Crandall, A. T. Ingraham, and H. J. Singer, *Do Unbundling Policies Discourage CLEC Facilities-Based Investment?*) (available at www.telepolicy.com). *See also* Phoenix Center POLICY BULLETIN NO. 6, *supra id.*; Comments of Drs. Thomas Hazlett (the Manhattan Institute), Arthur Havenner (Univ. California - Davis), and Coleman Bazelon (HHB I) to Phoenix Center POLICY BULLETIN No. 5 (http://www.phoenix-center.org/PolicyBulletin/HazlettetalComments.pdf); R. Carter Hill Comments PHOENIX CENTER POLICY BULLETIN No. 5 (http://www.phoenix-center.org/PolicyBulletin/HillComments.pdf); Further Comments of Drs. Thomas Hazlett (the Manhattan Institute), Arthur Havenner (Univ. California - Davis), and Coleman Bazelon (Analysis Group) PHOENIX CENTER POLICY BULLETIN No. 6 (HHB II) (http://www.phoenix-center.org/critiques/HHBII.pdf); A Response to Drs. Hazlett, Havenner and Bazelon (http://www.phoenix-center.org/critiques/ReplytoHHBII.pdf).

[3] *Verizon v. FCC*, 122 S.Ct. 1646, 1675 (2002).

[4] *See, e.g.*, Separate Statement of FCC Chairman Michael Powell, *In the Matter of Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Order And Notice Of Proposed Rulemaking, ___ FCC Rcd ___, FCC 04-179 (rel.

(Footnote Continued. . . .)

Administration recently decided not to defend and support the Federal Communications Commission's local telephone network unbundling policies before the Supreme Court,[5] and the FCC has just released "interim" unbundling rules that increase significantly the price for local loop connections that facilities-based entrants depend upon to provide U.S. small and mid-sized businesses with new, innovative and inexpensive services.[6] As a result, as the incumbents raise their wholesale rates above, and lower their commercial rates below, cost,[7]

August 20, 2004) (hereinafter "*Interim Rules*") (UNE-P is a "synthetic form of competition that would never have proved sustainable, or have provided long-lasting consumer benefits."); Kathleen Q. Abernathy, *My View from the Doorstep of FCC Change*, 54 FED. COM. L.J. 199, 206-7 (2002) ("Excessive sharing of facilities destroys the investment incentives of both incumbents and new entrants alike: rational incumbents avoid risking capital on new facilities if rivals can get a free ride, and rational entrants will refrain from deploying their own facilities if they have unrestricted access to incumbents' networks at cost-based rates. This stifling of investment incentives is all the more problematic where supposedly "cost-based" rates are, as in some cases, based on a model that makes unrealistic economic assumptions and accordingly turn out to be *below* actual cost. In striving to stimulate *some* form of local telephone competition, by creating expansive resale and unbundling opportunities, we have adopted rules that have failed to engender, and may have actually hampered, *facilities-based* competition—which is the most viable strategy in the long term and the one most likely to benefit consumers."). Curiously, it is unclear why public policy should focus so exclusively on the investment incentives of four firms rather than on generic sector investment. In so doing, these policies reek of centralized industrial planning and a deliberate choice in picking winners and losers.

5 Press Release: Statement by acting NTIA Administrator Michael D. Gallagher on Solicitor General's decision not to appeal DC Circuit Court decision (9 June 2004).

6 *Interim Rules, supra* n. 4; and *c.f.*, Lawrence J. Spiwak, *Interim Rules Buck Telecom Act*, LEGAL TIMES (30 August 2004) (available at http://www.phoenix-center.org/LegalTimes30Aug2004.pdf).

7 Anne Marie Squeo, *Bells Mount Two-Way Assault on Local Market - New-Client Perks Pressure Rivals, Who Also Face Rise In Rates for Using Network*, WALL STREET JOURNAL (3 August 2004) (Reporting that while on the one hand SBC is currently asking Michigan regulators to raise wholesale rates from $14/month to $28/month on the ground that current rates below $28 are purportedly confiscatory and below costs; yet on the other hand, quotes SBC Chief Operating Officer Randall Stephenson as stating that even though selling UNE-P at $14 is below cost, it is profitable for SBC to offer retail service in Michigan at a "promotional" rate of $7.95 because when the promotion expires in six months, the price would jump to $17.95. ("If I keep this customer [with promotions], I'm going to get $28 in the future and that's a lot better than $14."). *Significantly, however, $17.96 is still 36% below the $28 to which SBC is asking Michigan regulators to boost its wholesale rate.*

firms as large as AT&T and as small as Hoosier Telecom are being squeezed from the "mass market" for local telephone services.[8]

According to FCC Chairman Michael Powell, however, we need not worry about the demise of the 1996 Act's wholesale access provisions, because in one year "no one significant will be competing using unbundled network elements"[9]; instead, "there is going to be more competition, it's going to be better than what we had before, and I'll even go so far as to say: this isn't a prediction, it's a promise."[10] The purpose of this POLICY PAPER, therefore, is to test Mr. Powell's fundamental assumption that regulated rates for wholesale network access policies (like unbundling) dampen or decrease the incentive to deploy broadband technology.

The variability in rates for unbundled loops should help test which policy will result in the broadest availability of broadband services – *i.e.*, a policy that promotes competition and choice (*e.g.*, low loop rates) or a policy that promotes the protection of incumbent investment (*e.g.*, high loop rates). Generally, if the argument that unbundling deters investment is correct, then we would expect to see more broadband deployment in states with higher unbundled loop prices, *ceteris paribus*.

The econometric analysis in this POLICY PAPER shows the opposite, however: unbundled loop prices based on Total Element Long Run Incremental Cost ("TELRIC") actually lead to *increased availability* of broadband services and increased availability of *competitive* broadband services defined as area with at least four broadband providers. As a result, current policies which are openly

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8 *Id.* To wit, on 22 July 2004 five private investment firms – Kohlberg Kravis Roberts & Co., Centennial Ventures, Columbia Capital, Madison Dearborn Partners LLC and M/C Venture Partners – that have major stakes in large facilities-based CLECs such as Time Warner Telecom, NuVox Communications, Allegiance Telecom, and XO Communications Inc., wrote to Mr. Powell urging him to recognize and halt the adverse consequences of his policies. They noted that because most CLECs "operate on thin margins in highly price sensitive markets ... they simply [can] not absorb such dramatic cost increases or pass them along to customers in the form of increased rates". As such, the expected radical "increase in the price of the embedded base of high capacity loops and transport likely would cause some (competitors) to violate loan covenants."

9 15 June 2004 Gartner Fellows Interview with Michael Powell http://www4.gartner.com/research/fellows/asset_91308_1176.jsp).

10 Mark Wigfield, *FCC to Begin Work on Interim Phone Rules*, DOW JONES NEWSWIRES (10 June 2004).

hostile to the market-opening provisions of the 1996 Act will actually hinder President Bush's self-professed goal of "universal, affordable access for broadband technology by 2007."[11] Instead, these new policies will, in fact, lead to greater economic concentration and incumbent market power in the industry as firms are forced to exit the market.[12]

II. Empirical Model

The empirical analysis contained in this POLICY PAPER addresses the relationship between the price of unbundled loops and broadband availability. Local loops are the wires that connect each and every home, office, business, or building to the incumbent local telephone company's central switching offices. Unbundling these loops requires the incumbent to lease those wires at a price approximating forward-looking economic costs to new entrants, so that new entrants need not deploy their own loops in order to offer service in a region. These loops are generally made up of twisted copper wires and, increasingly, fiber optic cable. While there has been extensive debate before the FCC and state commissions as to whether a policy that forces incumbents to lease these loops (particularly fiber loops) would provide a disincentive for incumbents to deploy more fiber and broadband technology, until the end of 2003, federal rules clearly required that incumbents lease *all* of their loops – fiber optic loops included – to new entrants at rates set by the state regulatory commission.[13] As such, this

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[11] 26 March 2004 Remarks by the President on Homeownership Expo New Mexico, Albuquerque, New Mexico (http://www.whitehouse.gov/news/releases/2004/03/20040326-9.html). Curiously, however, President Bush appear to prefer to take a sequential approach to the problem – that is: "We ought to have a universal, affordable access for broadband technology by the year 2007, and then we ought to make sure as soon as possible thereafter, consumers have got plenty of choices when it comes to purchasing the broadband carrier." Taking this thought to its logical conclusion, it would appear that one fundamental assumption underlies the President's broadband policy: a view that promoting broadband competition or "choice" is incompatible with promoting broadband deployment, at least in the near term.

[12] *See supra* nn. 7-8.

[13] *C.f.*, State Of Maine Public Utilities Commission, Docket No. 2002-682, *Verizon-Maine Proposed Schedules, Terms, Conditions and Rates for Unbundled Network Elements and Interconnection (PUC 20) and Resold Services (PUC 21)* (September 3, 2004) (http://www.state.me.us/mpuc/orders/2002/2002-682o_Part%20II_.pdf) (holding that the incumbent Bell monopoly must: (1) include all of its wholesale offerings in its state wholesale tariff, including unbundled network elements (UNEs) provided pursuant to section 271 of the Telecommunications Act of 1996; and (2) file prices for all offerings contained in the wholesale tariff for our review for compliance with federal pricing standards, *i.e.* "Total Element Long Run

(Footnote Continued. . . .)

POLICY PAPER develops an econometric model that analyzes the rates that states have set for these rates in 2002 and 2003, takes into account this variability in prices and other factors that may impact broadband deployment, and determines whether local loop lease rates affect deployment of broadband service.[14]

Using publicly-available data collected and distributed by the FCC, this POLICY PAPER creates two measures of broadband availability. The first variable reflects only availability of a single broadband provider and is defined as the percentage of zip codes in a state that have at least one provider of broadband services. The FCC publishes this zip code data annually. This variable (A_U) reflects only the universality of access. The second variable is defined as the percentage of zip codes in a state that have at least four providers of broadband services. This variable (A_C) measures competitive access to broadband services.[15] With these two measures of availability we can evaluate the influence of unbundling on both the general availability of broadband service as well as whether or not the service is provided competitively.

Incremental Cost (TELRIC)" for section 251 UNEs and "just and reasonable" rates pursuant to sections 201 and 202 of the Communications Act of 1934 for section 271 UNEs.

[14] One of the major arguments supporting the movement to remove these access and pricing decisions from state commissions is that there are allegedly high differences in the prices for that access. This argument does not withstand scrutiny, however, because it has been statistically proven that that differences in UNE-P prices both across States and within States are due to genuine cost differences and differences in TELRIC and are not because of regulatory failure by the States. PHOENIX CENTER POLICY BULLETIN No. 9: *Federalism in Telecommunications Regulation: Effectiveness and Accuracy of State Commission Implementation of TELRIC in Local Telecoms Markets* (9 March 2004) (http://www.phoenix-center.org/PCPB9Final.pdf).

[15] The choice of four or more competitors is based on R. Selten, *A Simple Model of Imperfect Competition where Four are Few and Six are Many*, 2 INTERNATIONAL JOURNAL OF GAME THEORY 141-201 (1973); *see also* Report & Order and Notice of Proposed Rulemaking, 2002 Biennial Regulatory Review – Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996, MB Docket 02-277 (July 2, 2003) at ft. 609 ("A game-theoretic analysis of the number of independent firms that are required to produce competitive market performance is provided by R. Selter [sic], *A Simple Model of Imperfect Competition Where Four are Few and Six are Many*, INT'L J. GAME THEORY 2 (1973). This model is presented more intuitively in Louis Phillips [sic], COMPETITION POLICY: A GAME THEORY PERSPECTIVE Ch. 2 (Cambridge, UK: Cambridge Univ. Press 1995). An empirical study which finds that additional market entry has little effect on market conduct once a market has between three and five firms is provided by Timothy F. Bresnahan and Peter C. Reiss, *Entry and Competition in Concentrated Markets*, 99 J. OF POL. ECON. 997-1009 (1991). These limits roughly comport with the limit in the DOJ/FTC Merger Guidelines between moderately- and highly-concentrated markets. DOJ/FTC Guidelines § 1.51.")

Of course, broadband availability will be affected by more than just unbundling policy. A number of factors are expected to affect the ubiquity and competitiveness of broadband access including per-capita income, population density, time, and region specific factors. Measures for these factors include per-capita state income (*INC*), the percent of rural population (*RURAL*), the number of large cities (>250,000 in population) in a state (*BIGCITY*), and dummy variables for time (the data is semester data) and Bell Company region (*DVZ, DBLS, DSBC, DAMER; DQWEST* is excluded to avoid the dummy trap).[16]

Primarily, the policy inquiry should be on whether or not the prices of unbundled loops bear some relation to broadband availability.[17] This POLICY PAPER tests this proposition because many policymakers argue that the requirements that incumbents lease these loops to competitors at rates established by the state commission retard or stunt the deployment of new broadband services.[18] At the same time, having unbundled loops can promote deployment of broadband technology by new entrants, particularly those that utilize these loops to provide digital subscriber line ("DSL") broadband services, so are a fundamental component of broadband availability and competition. Thus, the question is an empirical one, and empirical questions cannot be resolved by non-empirical arguments. By examining the variability in rates for unbundled loops, it is possible to test which policy will result in the broadest availability of broadband services – *i.e.*, a policy that promotes competition and choice (*e.g.*, low loop rates) or a policy that promotes the protection of incumbent investment (*e.g.*, high loop rates).

For purposes of analysis, price is measured as the statewide average unbundled loop price. In addition to the price of the unbundled loop (P_L), the

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16 The variable *INC* is measured using per-capita state income published by the Bureau of Economic Analysis (www.bea.gov). The variables *RURAL* and *BIGCITY* are from U.S. Census data (www.census.gov). Loop prices are from Regulatory Source Associates, Telecom Regulatory Note (April 5, 2004) and loop cost is measured by the FCC's HCPM (www.fcc.gov/wcb).

17 Former FCC Chief Economist Simon Wilke reported that an internal FCC study found that the Bell Companies deployed more broadband in markets where competitor Covad had deployed its broadband service using unbundled loops. COMMUNICATIONS DAILY, November 24 (2004). The Powell Administration denies that such a study exists. *See* ALTS Request for Data Regarding ILEC Deployment of DSL Lines (Nov. 21, 2003): http://206.161.82.210/Filings/112103ALTSFOIArequest.pdf.

18 *See supra* nn. 9-10.