

The Opportunity Costs of Unbundled Network Element Regulation

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Abstract

Federal Communications Commission regulations require that incumbent local telephone companies must lease to competitors the entire platform of network elements necessary to provide local phone service. This paper assesses the effects of the platform requirement on economic welfare by examining the efficiency with which it transfers income from incumbent telephone companies to consumers. In several large states where platform regulation has stimulated significant competition, consumers receive only a fraction of the wealth transfer that they would receive if the wealth taken from incumbents were used to reduce access charges and universal service contributions from long-distance and wireless service. Using the wealth transfer to reduce access charges and universal service contributions would also generate larger increases in consumer welfare than platform regulation, because it would reduce the “tax” on services with relatively high elasticities of demand. Nationally, these alternative policies could have increased consumer welfare by \$3.3 billion and social welfare by \$5 billion in 2003. These results suggest that transferring wealth to consumers by passing it through competitive local exchange carriers involves significant opportunity costs to consumers and society.

Introduction

The Telecommunications Act of 1996 (referred to hereafter as the “Telecommunications Act”) assumes that competition is possible and desirable in all telecommunications markets. In some cases, it directs the Federal Communications Commission (FCC) to promulgate regulations that are intended to move the industry from monopoly to competition, rather than substitute regulation for competition. To the extent that such regulations accomplish this goal, they should have a similar effect on consumers as ideal regulation, reducing price and increasing the amount of service purchased. In addition, the move from monopoly to competition could produce other consumer benefits that regulation rarely delivers, such as continuous pressure to lower costs and introduce innovative new services.

The Telecommunications Act directs the FCC to issue regulations requiring incumbent local exchange carriers to lease “unbundled” elements of their local networks to competitors at regulated rates. Regulations also require incumbents to lease the entire suite of network elements necessary to provide local telephone service—the “unbundled network element platform” (hereafter referred to as “platform regulation”). Economic researchers disagree about the effects of platform regulation, for several reasons. First, they disagree over whether the incumbent’s retail prices are above, below, or equal to competitive levels. Second, they disagree over whether the FCC-mandated methodology for regulating network element rates yields prices that are above, below, or equal to competitive levels. Finally, they disagree over whether incumbents should have to provide competitors with the entire platform, or just some network elements.

This paper assesses the effect of platform regulation on economic welfare while sidestepping all of these disagreements. Instead of attempting to compare actual prices to unobservable “competitive” prices, we compare the efficiency of platform regulation to the efficiency of an alternative, feasible policy: reduction in long-distance access charges and contributions to the federal Universal Service Fund. Both policies can transfer wealth from incumbents to consumers. Reductions in access charges or universal service contributions could be designed as direct transfers from incumbents to consumers. Platform regulation, on the other hand, first passes a portion of the wealth transfer through competitive local exchange carriers, and this competition may prompt incumbents to reduce their own retail rates. Platform regulation could result in a larger wealth transfer to consumers if it stimulates efficient competition, or it could lead to a smaller wealth transfer if it stimulates inefficient competition.

These alternative policies could also have different effects on consumer welfare by generating different price effects on different types of services. Data from previous studies of several large states with significant platform-based competition make it possible to crudely estimate the effects of alternative policies. Unfortunately, it is not possible to perform a nationwide comparison due to data limitations. Nevertheless, the available data do permit a rough nationwide estimate of the opportunity cost of platform regulation.

Platform regulation has an opportunity cost—regardless of whether the local incumbent’s retail prices are monopolistic or competitive, and regardless of whether the regulated prices of network elements are above, below, or equal to competitive levels. Resolving these other disagreements, however, is the key to determining whether the opportunity cost of platform regulation is already included in previous estimates of the inefficiencies associated with access charges and universal service contributions, or if it is an additional cost that should be added to previous estimates.

Legal and Regulatory Basis for Resale and Unbundling

The Telecommunications Act sought to increase local telephone competition in three ways: “full facilities-based entry,” leasing of the incumbent’s unbundled network elements, and resale of the incumbent’s retail services.¹ Section 271 of the Telecommunications Act provides an incentive for incumbents to interconnect, unbundled, and conclude resale agreements.

“Full facilities-based entry” refers to Congress’s and the FCC’s desire for competitive local exchange carriers to build and maintain their own facilities in competition with incumbents. “Unbundling” occurs when competitors lease parts of the incumbent’s network. “Resale” occurs when competitors buy the incumbent’s services at a discounted wholesale rate, and then sell them to consumers at a retail rate.

The Telecommunications Act requires incumbent telephone companies to lease parts of their networks—“unbundled network elements”—to competitors at regulated rates. The most obvious example of a network element might be the local “loop”—the wire that connects a home or business to a switch located in the phone company’s central office. A competitor leasing only local loops would install its own switches in the incumbent’s central office and make its own arrangements to transport calls between its switches. In addition to individual network elements, the FCC also requires incumbents to lease the entire set of network elements necessary to provide local service—the unbundled network element platform. Leasing the unbundled network element platform is equivalent to buying the incumbent’s service at a wholesale discount. Leasing the platform has gradually become a more popular business strategy than resale of services, however, because it gives competitors a bigger discount. There is an overwhelming amount of literature and litigation regarding unbundled network element regulation.

Resale

Resale is provided for in section 251(c)(4) of the Telecommunications Act. Subpart (A) declares that it is the duty of incumbent local phone companies “to offer for resale at wholesale rates any telecommunications service that the carrier provides at retail to

¹ Federal Communications Commission, *Local Competition Order*, (last reviewed/updated on September 23, 2002). Available at http://www.fcc.gov/wcb/local_competition/welcome.html.

subscribers who are not telecommunications carriers...”² Subpart (B) states that incumbents are “not to prohibit, and not to impose unreasonable or discriminatory conditions or limitations on, the resale of such telecommunications service...”³ Subsection (3) of part (d) deals with wholesale pricing:

For the purposes of section 251(c)(4) of this title, a State commission shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier.⁴

There was precedent for the Telecommunications Act’s resale provisions. A similar policy, adopted to open the long-distance market to competition from firms like Sprint and MCI in the 1980s, seemed to work well.⁵ In the local market, however, few competitors now seem to regard resale as the preferred business strategy. AT&T, for example, found within a year after passage of the Telecommunications Act that offering local service through resale was unprofitable, despite a wholesale discount of approximately 17 percent.⁶

Regulation of wholesale discounts has generated arguments over whether the discount is supposed to reflect all of the incumbent’s costs associated with retail sales, or just those costs that the incumbent actually avoids by selling at wholesale. The FCC opted for the former formulation, but an accurate price signal would require the latter. As a result, widespread competition through resale could have the same effects as a below-cost price control. In practice, regulated wholesale discounts have usually averaged between 15 and 25 percent.⁷

Reports that incumbent carriers file with the FCC indicate that there were 1.7 million resold lines in December 1997, rising to a peak of 5.4 million in December 2000 before falling back to 1.8 million in December 2003. Competitors’ numbers are somewhat different; they reported acquiring 3.5 million resold lines in December 1999, rising to 4.9 million in June 2003, then receding to 4.7 million in December 2003. Despite the disparity in numbers, the competitors’ figures suggest that resale has become less

² 47 USC Sec. 251(c)(4)(A). Available at [http://uscode.house.gov/uscode-cgi/fastweb.exe?getdoc+uscview+t45t48+1341+0++\(Telecommunications%20Act%20of%201996\)%20%20AND%20\(USC%20w/10%20\(251\)\);CITE](http://uscode.house.gov/uscode-cgi/fastweb.exe?getdoc+uscview+t45t48+1341+0++(Telecommunications%20Act%20of%201996)%20%20AND%20(USC%20w/10%20(251));CITE).

³ 47 USC Sec. 251(c)(4)(B).

⁴ 47 USC Sec. 252(d)(3).

⁵ Yale M. Braunstein, “The Role of UNE-P in Vertically Integrated Telephone Markets: Ensuring Healthy and Competitive Local, Long-Distance and DSL Markets,” manuscript, School of Information Management and Systems, University of California, Berkeley (2003). Available at <http://sims.berkeley.edu/~bigyale/UNE/>.

⁶ Robert W. Crandall, “An Assessment of the Competitive Local Exchange Carriers Five Years after the Passage of the Telecommunications Act,” (January 2002): 32. Available at <http://www.criterioneconomics.com/docs/Crandall%20CLEC.pdf>.

⁷ Robert W. Crandall and Jerry Hausman, “Competition in U.S. Telecommunication Services: Effects of the 1996 Legislation,” in Sam Peltzman and Clifford Winston (eds.) *Deregulation of Network Industries: What’s Next?* (Washington DC: Brookings Institution Press, 2000): 73-112; 84, 97.

popular, as the percentage of their lines accounted for by resale fell steadily from 42.9 percent in December 1999 to 16 percent in December 2003.⁸

One explanation is that wholesale discounts are not large enough to permit effective competition against the incumbent's local rates, which are often below incremental cost because they benefit from cross-subsidies. Another possibility is that the regulated prices of the unbundled network element platform, which are equivalent to wholesale discounts of more than 45 percent, have made unbundling more attractive than resale from the perspective of competitors.⁹ A final explanation is that resale forces the competitor to offer a service identical to that offered by the incumbent. The most successful competitors, however, have developed their own networks that can offer innovative new services, or at least better service; therefore, resale is not a very attractive option for these competitors.¹⁰ A competitor can *market* resold services along with its own (such as long-distance service), but resale offers no cost or quality advantages from *producing* services using a different type of network.

A few studies have assessed the causes and consequences of resale. Employing 1991-2000 data from markets where the Bell companies are the incumbents, Eisner and Lehman found no statistically significant relationship between the size of wholesale discounts and the number of lines served by competitors via resale.¹¹ This finding is consistent with the theory that resale discounts have not been large enough to make resale profitable. Using 1998-2000 data, Crandall found that competitors relying on resale had only average revenue growth per dollar of capital assets—a finding that does not bode well, considering that competitors' "average" financial performance has not been very good. Crandall concludes, "Just changing the nameplate on the service is not typically a very good strategy for attracting customers."¹²

No studies have assessed the consumer benefits or costs of resale. A paucity of data on wholesale prices and costs makes it impossible to offer even a rough ballpark estimate.

Network Element Unbundling

Unbundled access to the incumbent's network is mandated in Section 251(c)(3) of the Telecommunications Act. Unbundled access is

⁸ Federal Communications Commission, *Local Telephone Competition: Status as of December 31, 2003*, Industry Analysis and Technology Division, Wireline Competition Bureau, (July 2004): Tables 3 and 5. Available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/lcom0604.pdf.

⁹ Robert S. Pindyck, "Mandatory Unbundling and Irreversible Investment in Telecom Networks," Sloan School of Management, Massachusetts Institute of Technology, (Revised: January 2004): 7. Available at http://www.analysisgroup.com/TC_VZ_UNE_Pindyck_01_04.pdf.

¹⁰ Crandall (2002): 23-32.

¹¹ James Eisner and Dale E. Lehman, "Regulatory Behavior and Competitive Entry," *For presentation at the 14th Annual Conference Center for Research in Regulated Industries* (June 28, 2001). Available at <http://www.telepolicy.com/elpaper.pdf>.

¹² Crandall (2002): 42.

[the] duty to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory...¹³

Congress and the FCC reason that incumbent local phone companies “have economies of density, connectivity, and scale; traditionally, these have been viewed as creating a natural monopoly.”¹⁴ Incumbents are able to provide service at much lower rates because they hold the overwhelming advantage of already having built a network. Congress and the FCC have attempted to remove this advantage through the unbundling requirements, and by doing so, to increase entry into local telephony market.¹⁵

Extent of Unbundling. The extent of these unbundling requirements has generated significant controversy. The Telecommunications Act instructs the FCC to consider whether access to an incumbent’s proprietary network elements is “necessary” and whether an incumbent’s failure to provide access to non-proprietary elements would “impair” a competitor’s ability to provide service.¹⁶ In practice, which network elements must be made available to competitors depends in large part on how one defines “impair.” Several rounds of FCC regulations implementing the Telecommunications Act declared that incumbents must make available both individual network elements and the unbundled network element platform. The FCC’s *Local Competition Order*, released August 8, 1996, identified a minimum set of network elements:

The minimum set of network elements the Commission identifies are: local loops, local and tandem switches (including all vertical switching features provided by such switches), interoffice transmission facilities, network interface devices, signaling and call-related database facilities, operations support systems functions, and operator and directory assistance facilities.¹⁷

¹³ 47 USC Sec. 251(c)(3).

¹⁴ Federal Communications Commission, *The First Report and Order in the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, FCC 96-325 (Adopted August 8, 1996): paragraph 11. Available at http://www.robotics.net/clec/act/io_index.html.

¹⁵ Federal Communications Commission, *The First Report and Order in the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, FCC 96-325 (Adopted August 8, 1996): paragraph 27.

The Commission also concludes that [ILECs] are required to provide access to network elements in a manner that allows requesting carriers to combine such elements as they choose, and that [ILECs] may not impose restrictions upon the uses to which requesting carriers put such network elements (paragraph 27).

¹⁶ 47 USC Sec. 251(d)(2).

¹⁷ Federal Communications Commission, *The First Report and Order in the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, FCC 96-325 (Adopted August 8, 1996): paragraph 27.

On multiple occasions, federal courts have held that the FCC's list of unbundled network elements is based on unreasonable definitions of "impair." Courts have called upon the FCC to articulate a definition of "impair" that is linked to natural monopoly and/or weighs the benefits of unbundling against the costs.¹⁸ Such a definition would likely lead to a smaller list of network elements that must be unbundled and eliminate the requirement that incumbents offer an entire unbundled network element platform. (The platform requirement appears to be based on the assumption that entire local telephone networks, rather than just certain elements, are natural monopolies.) In August 2004, the FCC announced one-year transition measures while it tries again.¹⁹

Pricing. Prices for network elements, determined by state commissions, are to be just, reasonable, based on cost, nondiscriminatory, and "may include a reasonable profit."²⁰ Network element charges are based on a method called "Total Element Long Run Incremental Cost" (TELRIC) pricing. This price is based upon local telephone companies' Total Service Long Run Incremental Cost, "plus a reasonable share of forward-looking joint and common costs."²¹ TELRIC pricing

[equates] the current market value of the existing network of an incumbent telecommunications provider with the cost the [incumbent] would incur today if it built a local network that could provide all the services its current network provides, to meet reasonably foreseeable demand, using the least-cost, most-efficient technology currently available.²²

Thus, TELRIC is based not on the incumbent firm's actual historical costs, but rather on regulators' estimate of the costs that would be borne today by a hypothetical firm building the most efficient network regulators believe is possible. State commissions determine prices under the FCC's TELRIC pricing methodology. Actual prices vary from state to state, depending upon the circumstances of the firms involved.²³

¹⁸ *United States Telecom Assn. vs. Federal Communications Commission*, No. 00-1012 (March 2, 2004): 7-11, 19, 24.

¹⁹ Federal Communications Commission, *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, WC Docket No. 04-313, CC Docket No. 01-338 (Adopted July 21, 2004, Released Aug. 20, 2004). Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-179A1.pdf.

²⁰ 47 USC Sec. 252(d).

²¹ Federal Communications Commission, *The First Report and Order in the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, FCC 96-325 (Adopted August 8, 1996): paragraph 29.

²² Federal Communications Commission, *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers; Implementation of the Local Competition Provisions of the Telecommunications Act of 1996; Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Report and Order on Remand and Further Notice of Proposed Rulemaking, CC Docket No. 01-338; CC Docket No. 96-98; CC Docket No. 98-147, FCC 03-36 (Adopted February 20, 2003, Released August 21, 2003): paragraph 669, original citations omitted. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-36A1.pdf.

²³ Consider:

We also note that, for any given carrier, there may be significant differences in rates from state to state, and even from proceeding to proceeding within a state. We are concerned

Proceedings to calculate TELRIC prices have generated significant disagreement. In Virginia, for example, Verizon (the incumbent) proposed a price of \$22 per month for local loops, while AT&T and Worldcom argued the price should be \$6.50.²⁴

In 2003 the Commission began to reconsider the TELRIC pricing methodology. A Notice of Proposed Rulemaking released on September 15, 2003 states:

This NPRM solicits comment on tentative conclusions and modifications to our current UNE [unbundled network element] pricing regime that seek to preserve its forward-looking emphasis and its pro-competitive purposes, while at the same time making it more transparent and theoretically sound.²⁵

In essence, the FCC isn't looking to adopt an entirely new methodology *per se*; regulators still want a pricing scheme that is forward-looking. However, regulators are looking to make some changes. In a *Report* released August 21, 2003, the FCC concluded "that it is necessary to clarify the application of two components of TELRIC that have a major impact on UNE [unbundled network element] prices—cost of capital and depreciation."²⁶

Section 271

The Telecommunications Act gave the largest local telephone companies—the "Bell Operating Companies" that were divested by AT&T in 1984—an additional incentive to unbundle promptly. Section 271 of the Telecommunications Act states that if Bell Operating Companies unbundle their network sufficiently they are allowed to enter the interLATA long-distance market.²⁷ The Act specifies a variety of facilities that must be unbundled; no "impairment" analysis is required. Elements that are unbundled only

that such variable results may not reflect genuine cost difference but instead may be the product of the complexity of the issues, the very general nature of our rules, and uncertainty about how to apply those rules (paragraph 6).

Federal Communications Commission, *Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, Notice of Proposed Rulemaking, WC Docket No. 03-173 (Adopted September 10, 2003, Released September 15, 2003). Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-224A1.pdf.

²⁴ Timothy J. Tardiff, "Pricing Unbundled Network Elements and the FCC's TELRIC Rule: Economic and Modeling Issues," *Review of Network Economics* 1:2 (September 2002): 132-146. Available at <http://ssrn.com/abstract=339001>.

²⁵ Federal Communications Commission, *Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, Notice of Proposed Rulemaking, WC Docket No. 03-173 (Adopted September 10, 2003, Released September 15, 2003): paragraph 4.

²⁶ Federal Communications Commission, *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers; Implementation of the Local Competition Provisions of the Telecommunications Act of 1996; Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, CC Docket No. 01-338; CC Docket No. 96-98; CC Docket No. 98-147, FCC 03-36 (Adopted February 20, 2003, Released August 21, 2003): paragraph 675.

²⁷ 47 USC Sec. 271, see part (c) especially.

under Section 271 need not be offered at TELRIC prices; the prices need only avoid being “unjust, unreasonable, or unreasonably discriminatory.”²⁸

Once the Bell Operating Companies entered enough interconnection, unbundling, and resale agreements, competition was deemed to be underway, and they received approval under Section 271 to begin offering long-distance service. These companies have now all obtained approval to enter the long-distance market.²⁹

Previous Studies of Unbundled Network Element Regulation

At first glance, network element regulation might seem to be a simple and elegant solution to the monopoly problem in local telephone service. To the extent that incumbent phone companies enjoy a monopoly over certain elements of the telephone network, regulation can potentially promote competition by forcing them to lease these network elements to competitors at prices that would exist in a competitive market. If the underlying premise of the Telecommunications Act is right—that local telephone service is not a natural monopoly—then unbundled network element regulation should lead to competitive entry, eventually obviating the need for retail price regulation. Over time, competition might even make the unbundling requirements unnecessary once there is sufficient facilities-based competition.

Some participants in the telecommunications debate may go even further, advocating below-competitive pricing of network elements to give competition an even greater boost. The justification is that such pricing would elicit more rapid competitive entry, which is desirable because competition will bring new services and other innovations that consumers value. Experience shows that when regulated monopolies or cartelized industries are deregulated and opened to competition, substantial innovations result whose effects could not be quantified in advance.³⁰ Perhaps these benefits are worth sacrificing a little short-term economic efficiency. However, it is unlikely that below-competitive prices of network elements would hasten the arrival of these dynamic benefits. Indeed, such prices would more than likely assure that competitors would never build any of the unbundled network elements until the incumbent’s wear out, because those network elements would always be cheaper to lease from the incumbent than to build. To encourage efficient competition, with all of its dynamic benefits, it should be sufficient that monopolized network elements be offered at competitive market prices.

²⁸ *United States Telecom Assn. vs. Federal Communications Commission*, No. 00-1012 (March 2, 2004): 52.

²⁹ A list is available at http://www.fcc.gov/Bureaus/Common_Carrier/in-region_applications/.

³⁰ For a summary of relevant research, see Clifford Winston, “Economic Deregulation: Day of Reckoning for Microeconomists,” *Journal of Economic Literature* 31:3 (Sept. 1993): 1263-89; Robert Crandall and Clifford Winston, “Does Antitrust Policy Improve Consumer Welfare? Assessing the Evidence,” *Journal of Economic Perspectives* 17:4 (Fall 2003): 3-26; Robert Crandall and Jerry Ellig, *Economic Deregulation and Customer Choice* (Fairfax, VA: Center for Market Processes, 1997), available at <http://www.mercatus.org/regulatorystudies/article.php/839.html>; Jerry Ellig, “Railroad Deregulation and Consumer Welfare,” *Journal of Regulatory Economics* 21:2 (2002): 143-67.

There are three reasons that unbundled network element regulation as adopted by the FCC could fall short of the competitive ideal.³¹

(1) Regulated prices may fail to mimic the competitive market price of network elements.

Regulated prices based on historical costs are unlikely to mirror competitive market prices, because technological change tends to lower costs over time and because decades of monopoly likely inflated costs.³² Under TELRIC, regulators estimate hypothetical “competitive” prices based in part on their estimate of what prices could be. Given the informational advantage that incumbent firms possess, it is possible that regulators could adopt prices that are above competitive levels. Several studies clearly assume that the incumbents are monopolists with plenty of room to cut prices, either because they reap large monopoly profits or because they have inherited significantly inflated costs.³³

Regulated prices could also be below the competitive level. TELRIC represents regulators’ estimate of what a hypothetical efficient firm’s costs ought to be. The methodology has been widely criticized as understating costs, for a variety of reasons. Principal reasons are that TELRIC is based on hypothetical rather than actual costs, may

³¹ For the sake of simplicity, this entire discussion speaks of the “competitive” price in the same sense as most introductory economics textbooks—as a single price charged by a firm whose behavior is constrained by the presence of competitors. By assumption, the competitive firm must be as efficient as possible, or else it would have been displaced by competitors. Also by assumption, competition is sufficiently strong that the firm cannot unilaterally raise price or earn profits that exceed its cost of capital.

In an industry such as telecommunications, which is undergoing rapid technological change, the concept of the “competitive” price is somewhat more complicated, for several reasons. First, technological improvements mean that prices are likely to fall over time; thus, it is more accurate to speak of a competitive price path rather than a single competitive price. The more rapid the pace of innovation, the more rapidly prices fall—but the more rapidly prices fall, the higher they must be initially if firms expect to recoup their investments before competitors imitate or out-innovate them. Second, diverse consumer wants can lead to product differentiation; in such a situation, the “competitive” price is actually a set of prices for different products and services that are not perfect substitutes. Third, the possibility of innovation creates substantial uncertainty about how much consumers are willing to pay for a service, and for how long. This uncertainty requires a higher level of profit to elicit investment than would be required in the absence of uncertainty. For these reasons, “the competitive price” of a telecommunications service or facility is likely to be a range of price paths which differ from the price that would be observed in a relatively stable, regulated market. To keep the language simple, though, this study will continue to use the term “competitive price” to refer to this more complicated, dynamic collection of prices.

³² Braunstein (2003): 1.

³³ Richard N. Clarke et al., “Assessing the Economic Gains From Telecom Competition,” *NBER Working Paper Series*, Working Paper 10482 (May 2004). Available at <http://www.nber.org/papers/w10482>; Yale M. Braunstein, “UNE-P Benefits Update: SBC’s California Territory, 2004,” manuscript, School of Information Management and Systems, University of California, Berkeley, (May 2004). Available at <http://sims.berkeley.edu/~bigyale/UNE/>; Yale M. Braunstein, “UNE-P Benefits in Verizon’s New Jersey Territory,” manuscript, School of Information Management and Systems, University of California, Berkeley (March 2004). Available at <http://sims.berkeley.edu/~bigyale/UNE/>; Braunstein (2003).

assume unrealistically low depreciation rates, or ignores the cost of a valuable option that competitors receive from entrants who must lease network elements at TELRIC prices.³⁴

Below-competitive network element prices may appear to benefit consumers in the short run, either because they lead to lower retail prices or because they facilitate entry by competitors who offer innovative new services. However, below-competitive network element prices could diminish the incumbent's incentive to maintain the network, which could lead to shortages or service degradations.³⁵

The structure of telecommunications regulation suggests another likely effect of below-competitive prices for network elements. Incumbent phone companies are not free simply to abandon the local network or allow service to deteriorate. Financial analysts estimate that incumbent Bell companies need to reinvest 15-20 percent of their revenues in order to maintain the network without reducing service quality.³⁶ Given the historic common carrier obligation of local telephone companies, regulators would likely respond to below-competitive network element prices by mandating that the incumbents must continue to maintain a network sufficient to supply retail customer's demand for service, as well as competitors' demand for unbundled network elements, at the regulated rates. If the regulated rates are insufficient to elicit the investment, cross-subsidies would be required. Therefore, the inefficiencies of below-competitive prices for unbundled network elements may ultimately show up not as shortages or reduced investment in the local network, but rather as higher universal service fees, access charges, or other methods of extracting revenue from the services that subsidize local service. In addition to generating additional funds for cross-subsidies, higher charges in these other markets would harm consumers by reducing the amount of service consumed.

(2) There are already significant cross-subsidies inherent in the structure of regulated retail telephone rates.

³⁴ See, Alfred E. Kahn, Timothy J. Tardiff, and Dennis L. Weisman, "The Telecommunications Act at 3 years: An Economic Evaluation of its Implementation by the FCC," *Information Economics and Policy* 11:4 (1999): 319-365; Alfred E. Kahn, "Whom the Gods Would Destroy, or How Not to Deregulate," *AEI-Brookings Joint Center First Distinguished Lecture* (2001). Available at <http://www.aei-brookings.com/admin/authorpdfs/page.php?id=112>; Jerry Hausman, "The Effect of Sunk Costs in Telecommunications Regulation," paper presented at a conference at Columbia University (October 2, 1998). Available at http://econ-www.mit.edu/faculty/download_pdf.php?id=258; Jerry Hausman and J. Gregory Sidak, "A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks," *Yale Law Journal* 109:3 (December): 417-505. Available at <http://ssrn.com/abstract=205670>; Robert W. Crandall, Allan T. Ingraham, and Hal J. Singer, "Do Unbundling Policies Discourage CLEC Facilities-Based Investment?" *Topics of Economic Analysis and Policy* 4:1(2004): 1-23. Available at http://www.criterioneconomics.com/docs/BE%20Article_Distribution_Feb%2027.pdf; Thomas M. Jorde, J. Gregory Sidak, and David J. Teece, "Innovation, Investment, and Unbundling," *Yale Journal on Regulation* 17:1 (Winter 2000): 1-37. Available at <http://proquest.umi.com/pqdweb?index=1&did=000000052768839&SrchMode=1&sid=1&Fmt=6&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1092338733&clientId=31810>; Pindyck (2004).

³⁵ Below-competitive prices could also diminish the incentive to develop new services if they are applied to those services. Since DSL is the principal service to which this argument is relevant, the issues surrounding application of TELRIC prices to new services are addressed in the discussion of broadband, below.

³⁶ Pindyck (2004): 24.

For most residential customers, the monthly charge for local phone service fails to cover the incremental cost of providing the service.³⁷ Businesses usually pay higher rates than residences, and so it is more likely that business rates at least cover the incremental cost of service. To encourage competition, unbundled network element prices must be sufficiently low that competitors can profitably meet or beat the incumbent's regulated prices. This is more likely for business customers than for residential customers. Given the size of cross-subsidies to basic phone service, it is possible that the competitive market prices of unbundled network elements would be insufficiently low to make entry profitable. Regulators then face a Hobson's choice of either having competition appear to be a failure, or mandating below-competitive prices for network elements so that competitors can match the incumbent's below-cost retail prices.

(3) Mandated access appears to apply to a larger number of network elements than just those over which the incumbent has a monopoly.³⁸

As the controversy over the meaning of "impair" suggests, the FCC has failed to satisfy courts that it has articulated a rational principle for identifying network elements that should be made available to competitors. Since the FCC has required that incumbents make available an entire platform of elements that would allow a competitor to offer local phone service, regulators have likely forced incumbents to make available some network elements that are not monopolized. For example, in many cases competitors may be able to procure switches and place them in the incumbent's central office; in those situations, the incumbent has no monopoly on local switching.

If the regulated prices for non-monopolized network elements are above competitive levels, then the price regulation is redundant and mostly just imposes unnecessary administrative costs. But suppose the incumbent's unbundled network element prices are below the competitive level for network elements that are available from other suppliers. Then the principal effects of the regulation are to transfer wealth from incumbents to entrants and/or consumers in the short run, and to discourage both the incumbent and

³⁷ There is virtually unanimous agreement among regulatory economists that historically, local telephone service has received cross-subsidies funded by overcharges for other services. Wayne Leighton, *Consumers and Cross-subsidies: An Interest Group Theory of Telecommunications Regulation* (Ph.D. dissertation, George Mason University, 1996). The argument that long-distance service does not cross-subsidize local service is based on the assumption that local loop costs are "common costs" of producing long-distance and local service. However, the fact that customers might use local phone lines for both local and long-distance calls does not mean that local loops are common costs for the phone companies. A loop provides a customer with access to the telecommunications network. The cost of any loop is incremental to the rest of the system, and a loop receives a subsidy if it does not cover its incremental costs. For a thorough discussion of theory and evidence, see Steve G. Parsons, "Cross-Subsidization in Telecommunications," *Journal of Regulatory Economics* 13:2 (1998): 157-182. For the most recent estimates of the effects of cross-subsidies to local telephone service, see Robert Crandall and Leonard Waverman, *Who Pays for Universal Service?* (Washington: Brookings Institution, 2000).

³⁸ Even the U.S. Court of Appeals for the D.C. Circuit, which has been highly critical of the FCC's implementation of the impairment standard, notes that "...the statutory structure suggests that 'impair' must reach a bit beyond natural monopoly." *United States Telecom Assn. vs. Federal Communications Commission*, No. 00-1012 (March 2, 2004): 24.

competitors from building, maintaining or improving those network elements in the long run.

A voluminous theoretical literature critiques the TELRIC methodology and unbundled network element regulation. Detailed discussion of this literature is outside the scope of this study. Instead, the focus here is on empirical studies that assess the effects of unbundled network element regulation.

Are network element prices too high?

The purpose of unbundled network element regulation is to jump-start competition in local telephone service by allowing competitors to gain a foothold in the market. If network element prices are above the levels that would exist in a competitive market, competitors would have much less incentive to use unbundled network elements to enter the market. Total investment in the telecommunications network would then be lower than it otherwise would be, for two reasons: (1) retail prices would be higher, reducing output, and (2) less competitive entry would likely mean fewer additional facilities would be constructed.

One recent paper raises the possibility that many state utility commissions set unbundled network element prices above TELRIC levels.³⁹ This study estimates that the accurate TELRIC price for the unbundled network element platform is \$15.10 per month, which the authors claim is 27.9 percent below actual average 2002 TELRIC rates for the platform. (The authors arrived at the \$15.10 figure by reducing 1998 FCC-calculated TELRIC prices by 5 percent per year to reflect assumed price and cost reductions.) If the network element platform prices were set at these “true” TELRIC levels, average local revenues per line would be 10.6 percent below the actual 2002 level. True TELRIC pricing, they contend, would increase the present value of telecommunications companies’ expenditures on investment and labor by \$71 billion over the next five years and by \$155 billion over the next 20 years.⁴⁰

The authors’ estimate of a “true” TELRIC rate may be accurate enough. However, the results of the model rely on the assumption that the “true” TELRIC rate of \$15.10 per month is 27.9 percent lower than actual rates.⁴¹ The National Regulatory Research Institute’s survey shows that the unbundled network element platform rate averaged \$16-17 per month in August 2004, down 16-20 percent from January 2002.⁴² The August 2004 figures are much closer to \$15.10, which implies that most of the benefits that this study predicts have already occurred as a result of price reductions since 2002.⁴³ Clarke

³⁹ Clarke et al (2004): 5.

⁴⁰ Clarke et al (2004): 5.

⁴¹ Clarke et al (2004): 31.

⁴² Billy Jack Gregg, “A Survey of Unbundled Network Element Prices in the United States (Updated January 2004)”. Available at <http://www.cad.state.wv.us/JanIntro2004.htm>.

⁴³ Another potential problem is that the calculations assume that the price elasticity of demand for telephone service equals -1 (Clarke et al 2004: 15). Most empirical studies find the elasticity for demand for local phone service is extremely low—which means that a reduction in price will lead to a negligible increase in consumption, and hence a much smaller increase in investment to supply the larger quantity demanded.

et al.'s predictions imply that the big reduction in unbundled network element platform rates between 2002 and 2004 should have been accompanied by both a reduction in retail telephone rates and a telecommunications investment boom.

Are network element prices too low?

Several studies calculate whether regulated prices of network elements are below the level that would exist in a competitive market.

Studies by David M. Mandy calculate that the FCC's forward-looking hybrid cost proxy model (HCPM) understates the present-value cost of an end-office switch by about 24 percent.⁴⁴ End-office switching is a significant cost, comprising approximately 10 percent of all costs in the HCPM. Aggregated nationally over the life of the switch, this means that incumbents receive approximately \$4.5 billion (in \$1999) less for access to their switches under TELRIC than they would receive in a competitive market.⁴⁵

An FCC working paper co-authored by Mandy and William Sharkey estimates the "correction factor" necessary to make TELRIC prices yield the target rate of return that regulators want to let incumbents earn. When investment costs fall by 11 percent annually—the percentage assumed for switching assets in the FCC's cost model—switching prices should be 50 percent higher than that model dictates. In other words, TELRIC may underestimate the correct switching prices by about 33 percent. The principal reason for the difference is that TELRIC assumes that the firm charges a uniform price over the life of the asset, whereas a firm in a competitive market where investment costs fall over time would charge higher prices than TELRIC assumes in the early years. If TELRIC prices are recalculated before the end of the asset's useful life, TELRIC under-compensates the incumbent by depriving it of the higher prices in the early years but forcing the incumbent to lower prices in later years.⁴⁶

⁴⁴ State utility commissions, not the FCC, set TELRIC prices, and utility commissions may select cost models other than the FCC's hybrid cost proxy model. This model is, however, the tool the FCC uses to estimate forward-looking costs for the purpose of distributing universal service subsidies.

⁴⁵ David M. Mandy, "Pricing Network Elements When Costs are Changing," *Telecommunication Policy* 26:1-2 (Feb.-March 2002): 53-67; 55, 64. Available at http://www.sciencedirect.com/science?_ob=MIimg&_imagekey=B6VCC-44MYX71-3-2X&_cdi=5951&_orig=browse&_coverDate=03%2F31%2F2002&_sk=999739998&view=c&wchp=dGLbVtb-zSkWW&_acct=C000035118&_version=1&_userid=650615&md5=f7905f2e9f1a5afe8909700c1e7b6646&_ie=f.pdf; David M. Mandy, "TELRIC Pricing With Vintage Capital," *Journal of Regulatory Economics* 22:3 (November 2002): 215-249; 218. Available at <http://proquest.umi.com/pqdweb?index=0&did=000000531071341&SrchMode=1&sid=3&Fmt=10&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1090267571&clientId=31810>.

⁴⁶ David M. Mandy and William W. Sharkey, "Dynamic Pricing and Investment from Static Proxy Models," OSP Working Paper Series, Paper #40, (September 2003): 8-9. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-238934A2.pdf.

To be fair, the FCC has stated that it is "appropriate for state commissions to employ accelerated depreciation in order to reflect accurately the anticipated decline in the value of assets in a competitive market." It is unknown whether states have done so. See Federal Communications Commission, *Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange*

Hausman argues that TELRIC prices inadequately compensate incumbents for the risks associated with sunk costs and uncertainty. He estimates that the price for transport links that adjusts for these factors should be 2.35 times TELRIC, and that for ports should be 1.23 times TELRIC.⁴⁷ These estimates suggest that the TELRIC prices are 67 percent and 19 percent below competitive levels, respectively.

Crandall, Ingraham, and Singer examined the effect of regulated rates for unbundled loops—the wires that connect individual customers with telephone company switching facilities. Loops are arguably the most likely network element to be a natural monopoly. They found that in 2000 and 2001, competitors' ratio of facilities-based loops to loops leased from the incumbent was lower in states where unbundled loop rates were lower relative to the cost of building new loops. The rate of growth of competitors' facilities-based loops was also lower when unbundled loop rates were lower relative to the cost of building new loops. Lower regulated loop prices prompt competitors to lease loops rather than build their own.⁴⁸

Studies of stock price movements offer an indirect test of TELRIC's effects. If regulated prices are below the competitive level, then incumbents' returns should be more volatile, increasing their cost of equity capital. Ingraham and Sidak estimate that equity costs of two major incumbents—BellSouth and Verizon—increased by 1.78-4.13 percentage points during the most recent recession. In addition, a January 6, 2003 announcement by FCC Chairman Michael Powell would seek to end price regulation of the unbundled network element platform generated large stock price increases not just for the incumbent phone companies, but also for telecommunications equipment manufacturers. This last result is especially significant because manufacturers could expect to lose business if Powell's initiative retards facilities-based competition.⁴⁹

All of these studies imply that TELRIC prices are below those that would exist in a competitive market. However, none of them go the next step and estimate the impact on consumers of this below-competitive price ceiling.

Carriers, Notice of Proposed Rulemaking, WC Docket No. 03-173 (Adopted September 10, 2003, Released September 15, 2003): paragraph 22, original citations omitted.

⁴⁷ Hausman (1998): 15.

⁴⁸ Crandall, Ingraham, Singer (2004): 20.

⁴⁹ Allan T. Ingraham and J. Gregory Sidak, "Mandatory Unbundling, UNE-P, and the Cost of Equity: Does TELRIC Pricing Increase Risk for Incumbent Local Exchange Carriers?" *Yale Journal on Regulation* 20:2 (Summer 2003): 389-406. Available at <http://ssrn.com/abstract=374221>.

Ekelund and Ford (2003) conclude that regulation of network element prices has not made incumbents' returns more volatile, but Ingraham and Sidak (2003) argue that their estimation procedure is more accurate because it includes data for the entire length of the recession and uses daily rather than weekly returns.

See Robert B. Ekelund and George S. Ford, "Innovation, investment, and unbundling: An empirical update," *Yale Journal on Regulation* 20:2 (Summer 2003): 383-388. Available at <http://proquest.umi.com/pqdweb?index=0&did=000000355646121&SrchMode=1&sid=2&Fmt=6&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1092338782&clientId=31810>.

Thus far, no empirical research proves that network element regulation has reduced incumbents' investments in maintaining the local telephone network.⁵⁰ Indeed, Sidak notes that there appears to be significant excess capacity in the telecommunications industry, which suggests over- rather than under-investment.⁵¹ A definitive answer would need to focus on investments in the local network, rather than all telecommunications facilities, and disentangle the effects of network element prices from the effects of the general telecommunications industry boom of the 1990s. In the absence of such evidence, any negative effects of unbundled network element regulation would have to take the form of cross-subsidies from other services that are higher than they would otherwise be.

Are regulated network element prices low enough to offset cross-subsidies?

Regulated network element prices may be below competitive levels, but so are the incumbent phone companies' retail prices for residential service in many locations, especially rural areas.⁵² It is possible that network element prices, even if below competitive levels, are nevertheless insufficiently low to prompt competitive entry in the face of cross-subsidized local rates:

Local phone companies are being forced simultaneously to provide service at averaged prices to expensive rural customers and to sell wholesale access at cost to their competitors, who can then resell phone service to urban and business customers. This in turn, undermines the local phone companies ability to comply with universal service obligations.⁵³

By most measures, competitive entry has grown steadily since passage of the 1996 Telecommunications Act. For wholly or partially facilities-based competitors, revenues, access lines, voice switches, and market share have all grown steadily, despite a huge drop in competitors' stock market values since 1999 and many significant bankruptcies.⁵⁴

At least during the first three years after passage of the Telecommunications Act, competitors (including those leasing some network elements) entered where the

⁵⁰ Several studies find that recently abandoned policies applying unbundled network element regulation to new types of investments such as broadband, fiber to the home, and advanced services generally tend to reduce those new investments by incumbents. See Eisenach and Lenard "Telecom Deregulation and the Economy: The Impact of "UNE-P" on Jobs, Investment and Growth," *Progress on Point*, Release 10.3 (January 2003): 11-13. Available at <http://www.pff.org/publications/communications/pop10.3unepim pact.pdf>.

⁵¹ J. Gregory Sidak, "The Failure of Good Intentions: The WorldCom Fraud and the Collapse of American Telecommunications After Deregulation," *Yale Journal on Regulation* 20:2 (Summer 2003): 207-267; 216. Available at http://www.aei.org/docLib/20030610_TheFailureofGoodIntentions.pdf.

⁵² Crandall and Waverman (2000): 105-28.

⁵³ Stuart Buck, "TELRIC vs. Universal Service: A Takings Violation?" *Federal Communications Law Journal* (2003): 3. Available at <http://ssrn.com/abstract=454200>.

⁵⁴ Association for Local Telecommunications Services (ALTS). *The State of Local Competition 2004*. (July).

economies of scale suited them best: high density or urban markets.⁵⁵ It is cheaper to provide wireline service to urban consumers than to rural consumers. Historically, rural consumers' local telephone service has been subsidized by urban consumers, because prices are averaged, regardless of the marginal cost per consumer.

Studies estimating the effect of unbundled network element prices on competition and prices report mixed results. Prices for the entire platform have received the most attention.

Employing 1997-2000 data from markets where the Bell companies are the incumbents, Eisner and Lehman find that lower unbundled network element prices do *not* increase the number of lines served by competitors using unbundled network elements, but they decrease facilities-based entry.⁵⁶ Section 271 approval, which indicates that regulators believe the Bell incumbent has unbundled sufficiently to open the local market to competition, is associated with a 260,000-336,000 increase in lines served by competitors using unbundled network elements. Since the incumbents are Bell companies and Section 271 proceedings tended to reduce unbundled network element rates, this variable may be picking up the effects of unbundled network element pricing. Lower residential rates are often associated with less facilities-based competitive entry, but lower business rates are not—a logical finding, given that business rates are usually higher than residential rates.

A study using 1998 data found that there is less facilities-based competition for residential customers when the ratio of business to residential rates is higher.⁵⁷ This result suggests that cross-subsidies from business to residential customers discourage competition for residential customers. Using a different measure of business rates, Eisner and Lehman found that the ratio of business to residential rates has no effect on entry, and they suggest this is because business rates in all states so exceed residential rates that the ratio does not affect the amount of entry.⁵⁸

Braunstein notes that in California, the Public Utilities Commission in 1999 set the price for SBC's unbundled network element platform at \$22.94 per month, which was approximately equal to the retail price of phone service.⁵⁹ In May 2002, the commission reduced the unbundled network element platform rate by 39 percent, to \$13.97 per month. Nevertheless, the price charged by AT&T (a major competitor using the network element platform) for a basic local phone line at the end of 2003 was actually higher than SBC's, which suggests there is little profit potential for competitors in just reselling basic phone service. In a similar study, Braunstein's data show that AT&T's price for a basic

⁵⁵James Zolnierok, James Eisner, and Ellen Burton, "An Empirical Examination of Entry Patterns in Local Telephone Markets," *Journal of Regulatory Economics* 19:2 (March): 143-160. Available at <http://www.tprc.org/ABSTRACTS99/ZEBTPRC.PDF>; Robert W. Crandall (2002).

⁵⁶ Eisner and Lehman (2001).

⁵⁷ Augustin J. Ros and Karl McDermott, "Are Residential Local Exchange Prices Too Low? Drivers to Competition in the Local Exchange Market and the Impact of Inefficient Prices," in Michael A. Crew (ed.), *Expanding Competition in Regulated Industries* (Boston: Kluwer Academic Publishers, 2000): 149-68.

⁵⁸ Eisner and Lehman (2001): 10.

⁵⁹ Braunstein (2003): 6.

local phone line in New Jersey is higher than that of the incumbent, Verizon.⁶⁰ Thus, it appears from these figures that even large reductions in the platform price were insufficient to make platform-based competition for basic telephone service profitable.

Braunstein's results show that competition is much more feasible for packages that include long-distance service and vertical features, such as call waiting or voice mail. This is consistent with 2001-02 surveys of rates for packages of local, long-distance, and vertical services in Illinois and Michigan, which found that competitors offer a "typical" package for \$11.87 per month less than the incumbent in Illinois and \$8.02 per month less than the incumbent in Michigan.⁶¹

Nationally, reductions in platform rates since 2002 appear to have increased utilization of the platform. Between January 2002 and July 2003, the average price of the platform fell by 17 percent, from \$18.95 to \$15.67 per month.⁶² The number of platform lines rose from 5.8 million at the end of 2001 to 13 million by the middle of 2003. By December 2003, platform lines accounted for 51 percent of all competitor lines, up from 29 percent at the end of 2001.⁶³

Even in the absence of policy changes, it is unclear whether platform-based competitors will survive over the long term. Analyzing data from 1998-2000, Crandall found that competitors whose revenues per dollar of assets grew the fastest were those that built their own networks, not those that relied on unbundled network elements.⁶⁴ There was no difference in performance between competitors targeting business or residential customers. Competitors using a mixed strategy of leasing some network elements and building some of their own network did better than those that relied wholly on unbundled network elements but worse than those using their own network entirely. This result may occur because the typical competitor seeks to offer local telephone service in combination with other services, such as long-distance, Internet, high-speed data connection, or video. A competitor building its own network can offer a wider array of services, using newer technology, than one relying heavily on the incumbent's older network, which was originally designed to carry voice traffic only. These results do not mean that a competitor that failed to invest in its own network could not be successful. They simply mean that those firms that did not invest in their own facilities were less likely to succeed.

The existing research on competition suggests that unbundled network element regulation encourages entrants to use unbundled network elements, but discourages them from building their own facilities. Prices are insufficiently low to make stand-alone sale of basic telephone service a profitable business. Competitors who offer packages that

⁶⁰ Braunstein (March 2004).

⁶¹ Illinois Coalition for Competitive Telecommunications (ICCT). *Consumer Savings from Local Telephone Service Competition in Illinois (2003)*; Michigan Alliance for Competitive Telecommunications (MACT). *Consumer Savings from Local Phone Competition in Michigan (2003)*.

⁶² Gregg (2004).

⁶³ Federal Communications Commission. *Local Telephone Competition: Status as of December 31, 2003*, Industry Analysis and Technology Division, Wireline Competition Bureau (July 2004): Tables 3 and 5.

⁶⁴ Crandall (2002).

include other features, such as vertical services and long-distance, appear to offer lower package prices than the incumbents in a number of large states.

So cui bono, Sonny?

No studies published in scholarly journals have quantified the effect of unbundled network element regulation on retail prices or consumer welfare. Several studies published by various think tanks or coalitions, and several working papers on web sites, estimate consumer savings or consumer benefits.

The studies sponsored by lobbying coalitions in Illinois and Michigan estimate residential consumer savings from competitors using the unbundled network element platform by calculating the difference in phone bills from incumbents and competitors for a package of local, vertical, and long-distance services. The Illinois study estimates that competitors' customers save \$11.87 per month, and the Michigan study estimates that competitors' customers save \$8.02 per month. The Illinois study also posits savings for the incumbent's customers of \$4.20 per month, and the Michigan study posits savings for the incumbent's customers of \$32.2 million annually. The studies are both based on data gathered from the third quarter of 2001 thru the third quarter of 2002.⁶⁵

These studies likely overstate the savings, for several reasons. First, they attribute all of the price savings to the unbundled network element platform. This ignores the effects of actual or potential competition from facilities-based telephone companies, competitors who lease only some network elements, cable, and wireless.⁶⁶ An accurate measure of the effects of the platform would compare actual prices to the prices that would exist in the absence of the platform. Second, the studies may artificially inflate the price differences due to the way they handle the long-distance component of the service package. SBC did not offer long-distance service during the time when the data were gathered, but the competitors offered packages of local service, vertical features, and long-distance. In an effort to make prices comparable, the studies increased SBC's price by an amount equal to the average number of toll minutes in the sample multiplied by the average per-minute price of toll service. This adjustment means that SBC's hypothetical package price incorporates long-distance at its stand-alone price, rather than a lower price that would reflect the efficiencies of packaging. The competitor's package price, on the other hand, includes these efficiencies.

A more sophisticated approach can be found in studies estimating the effect of unbundled network element competition on residential prices in California and New Jersey. Braunstein compares the incumbent's and AT&T's 2003 prices of packages that include local, vertical, and long-distance services with the incumbent's 2002 prices. Braunstein estimates that California residential customers in SBC's territory save \$345-625 million annually due to the unbundled network element platform. He obtained similar results in a

⁶⁵ ICCT (2003), MACT (2003).

⁶⁶ Wireless may be an especially important source of pricing pressure on long-distance rates, since wireless companies offer national calling plans for a modest additional fixed charge.

study of New Jersey, estimating that competition via the unbundled network element platform saved residential customers \$133-217 million annually.⁶⁷

Unlike the Illinois and Michigan studies, Braunstein examines comparable packages of SBC and AT&T services.⁶⁸ Nevertheless, his calculations likely overstate the savings, because he often uses the prior year's SBC a la carte prices as a proxy for the prices that would exist in the absence of unbundled network element regulation. As a result, some of the inherent efficiencies of packaging got counted as benefits from unbundled network element regulation, and any underlying increases in productivity or efficiency were attributed to unbundled network element regulation as well. Like the Illinois and Michigan studies, Braunstein attributes all of the price savings to competition using the unbundled network element platform, rather than other forms of competition. In addition, he ignores other factors that may explain reductions in long-distance prices over time, such as long-term price trends driven by technological change, excess capacity, and entry of the Bell companies into long-distance service. This is an especially significant factor, since a lot of the California and New Jersey price savings are driven by reductions in long-distance prices. To partially adjust for other factors affecting long-distance prices, he offers a "conservative" estimate that apportions only part of the package savings to local competition, as well as an "aggressive" estimate that assumes long-distance prices were already at competitive levels in 2002 and hence had no further room to fall.

A Phoenix Policy Center (2004) study employing 1999 data estimated nationally that "all distance" packages with no additional usage charges save consumers about \$6.7 billion annually compared to a la carte prices. Consumer welfare increases by an additional \$3.3 billion due to increased use of telecommunications services at the lower price.⁶⁹ The study's rhetoric implies that these savings are due to competition fostered by unbundling, but it does not test alternative explanations, such as competition from facilities-based carriers, technological change, or excess long-distance capacity. Nevertheless, the study makes the novel point that a long-distance carrier can achieve "do-it-yourself" reductions in access charges by becoming a competitive local exchange carrier. Of course, incumbents who are permitted to offer packages of local and long-distance services can achieve the same kinds of savings, but they were not permitted to offer long-distance service in 1999. Although presented as an estimate of the benefits of unbundling, the study's findings actually identify a significant benefit of packaging: it reduces inefficient cross-subsidies by effectively circumventing access charges.

Effects of platform regulation on consumer welfare

Information contained in the Illinois, Michigan, California, and New Jersey studies can serve as a starting point for assessing the effects of unbundled network element regulation on consumer welfare. Each of the studies estimates consumer savings by

⁶⁷ Braunstein (March 2004) and (May 2004).

⁶⁸ For more information, see Braunstein's spreadsheets at <http://sims.berkeley.edu/~bigyale/UNE/>.

⁶⁹ Phoenix Policy Center, "The \$10 Billion Benefit of Unbundling: Consumer Surplus Gains from Competitive Pricing Innovations," *Policy Bulletin* No. 8 (January 27, 2004).

identifying residential price reductions offered by platform-based competitors and incumbents. None posits any increase in telephone subscriptions as a result of the price reductions—an assumption consistent with well-known research findings that subscription levels respond very little to price changes. Competitors appear to sell basic phone service at a price similar to incumbents, and incumbents do not appear to have lowered basic phone rates in response to competition. Given this reality, consumers likely perceive the reduction in package prices as a reduction in the price of non-basic services such as extended area calling, toll calling, and vertical features. Therefore, one might expect the price reductions to cause an increase in use of these services. A rough estimate of the additional value this creates for consumers can be calculated by assuming that consumers perceive the package price reductions as a reduction in the price of long-distance service. Table 1 shows the results of this calculation, using data in the four studies and assuming that the elasticity of demand for long-distance service equals -0.7 (a common finding in the empirical literature on long-distance pricing).⁷⁰ The “per line” figure is the consumer benefit divided by the total number of residential lines in each state, as reported in or estimated from data in each study.

For reasons outlined above, all of these studies likely over-estimate the retail price reductions caused by the unbundled network element platform. One major factor influencing package prices is the fact that packaging local with long-distance service allows a telecommunications provider to avoid paying access charges. As Table 2 shows, adjusting the price savings to remove the effect of a 1 cent/minute reduction in access charges substantially reduces the price savings figures.⁷¹ The adjusted figures may still overstate the effects of network element platform competition, but one large source of inaccuracy has been removed.

Table 3 shows revised savings, consumer surplus, and consumer welfare figures using the adjusted price savings in Table 2. The revision reduces the effects on consumer welfare moderately for Illinois and Michigan and substantially for California and New Jersey, as Figure 1 demonstrates.

⁷⁰ Different empirical studies, using data from the past several decades, consistently find price elasticities between -0.51 and -0.72. See Jerry Hausman and Howard Shelanski, “Economic Welfare and Telecommunications Regulation: The E-Rate Policy for Universal-Service Subsidies,” *Yale Journal on Regulation* 16 (Winter 1999): 36-37. Crandall and Waverman (2000: 186, fn. 13) note research finds that the elasticity of demand for long-distance service is between -0.7 and -0.75. In earlier work, Crandall assumed a demand elasticity of -0.7, based on a number of prior studies. See Robert W. Crandall, *After the Breakup* (Washington: Brookings, 1991): 138. The calculations also assume a linear demand curve. Thus, the formula for the change in consumer welfare is simply $.5\Delta p\Delta q$. The resulting figures are approximations, since the elasticity of demand changes as one moves along the demand curve.

⁷¹ FCC estimates suggest that access charges average between 1 cent and 1.44 cents per conversation minute, depending on the data and assumptions employed in the estimate. States usually impose intrastate long-distance access charges that are substantially higher.

Table 1: Effect of unbundled network element platform on consumer welfare

State, incumbent, year	Annual savings	Consumer surplus gain		Consumer welfare gain	
		Total	Per line	Total	Per line
Illinois, SBC 2002	\$209,000,000	\$46,923,360	\$13.43	\$255,923,360	\$73.27
Michigan, SBC, 2002	\$88,600,000	\$12,533,309	\$4.50	\$101,133,309	\$36.31
California, SBC, 2003 ("conservative")	\$345,213,818	\$17,522,856	\$1.53	\$362,736,674	\$31.68
California, SBC, 2003 ("aggressive")	\$624,824,721	\$57,404,370	\$5.01	\$682,229,091	\$59.59
New Jersey, Verizon, 2003 ("conservative")	\$133,161,198	\$3,389,717	\$0.73	\$136,550,915	\$29.42
New Jersey, Verizon, 2003 ("aggressive")	\$217,282,413	\$9,025,208	\$1.94	\$226,307,621	\$48.75

Table 2: Effect of adjusting savings for 1 cent/minute reduction in access charges

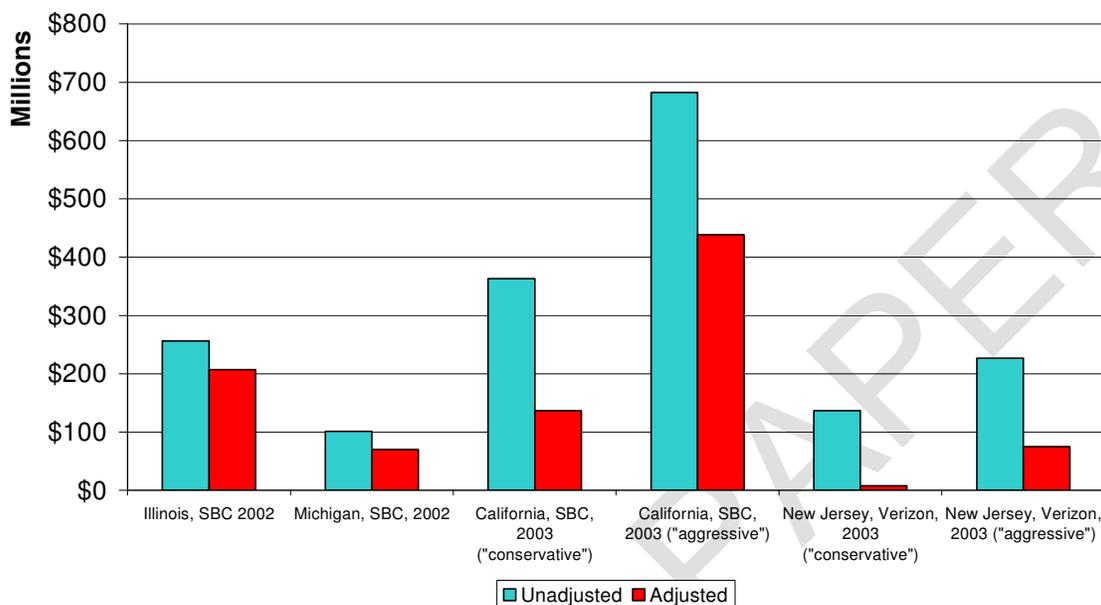
State, incumbent, year	Monthly Savings, Competitors' Customers	Adjusted Savings, Competitors' Customers	Monthly Savings, Incumbent's Customers	Adjusted Savings, Incumbent's Customers
Illinois, SBC, 2002	\$11.88	\$11.05	\$4.20	\$3.37
Michigan, SBC, 2002	\$8.03	\$7.27	\$1.22	\$0.46
California, SBC, 2003 ("conservative")	\$4.46	\$2.92	\$2.26	\$0.72
California, SBC, 2003 ("aggressive")	\$9.31	\$7.77	\$3.93	\$2.39
New Jersey, Verizon 2003 ("conservative")	\$3.55	\$0.97	\$2.21	0
New Jersey, Verizon 2003 ("aggressive")	\$7.18	\$4.60	\$3.39	\$0.81

Adjustments reflect a 1 cent/minute access charge reduction multiplied by 83 average toll minutes in Illinois, 76 average toll minutes in Michigan, 154 weighted average toll minutes in California, and 258 weighted average toll minutes in New Jersey. Toll minutes are derived from data furnished in each study.

Table 3: Adjusted effect of unbundled network element platform on consumer welfare

State, incumbent, year	Annual savings	Consumer surplus gain		Consumer welfare gain	
		Total	Per line	Total	Per line
Illinois, SBC 2002	\$174,213,060	\$32,603,027	\$9.33	\$206,816,086	\$59.21
Michigan, SBC, 2002	\$63,206,008	\$6,378,448	\$2.29	\$69,584,457	\$24.98
California, SBC, 2003 ("conservative")	\$133,627,798	\$2,625,561	\$0.23	\$136,253,359	\$11.90
California, SBC, 2003 ("aggressive")	\$413,238,700	\$25,109,064	\$2.19	\$438,347,764	\$38.29
New Jersey, Verizon, 2003 ("conservative")	\$7,282,065	\$10,137	\$0.002	\$7,292,203	\$1.57
New Jersey, Verizon, 2003 ("aggressive")	\$73,571,233	\$1,034,723	\$0.22	\$74,605,956	\$16.07

Figure 1: Consumer benefits shrink when adjusted for efficiencies of packaging



To the extent that these findings actually represent the results of competition using the unbundled network element platform, they suggest that such competition has led to a noticeable increase in consumer welfare, compared to the previous status quo. However, neither the four state studies nor the figures in Tables 1 - 3 assess the opportunity cost of this policy.

The potential for opportunity costs exists regardless of the level of regulated unbundled network element rates. For consumers, the opportunity cost consists of two parts: a wealth transfer and an effect on consumer surplus.

Wealth transfer. As long as unbundled network element rates are below the monopoly level, they transfer wealth from incumbents to competitors and consumers. Retail price reductions by incumbents in response to the competition, of course, flow directly to consumers. The key question, therefore, is the extent to which the wealth transferred from incumbents to platform-based competitors flows through to consumers.

If the competitors are economically efficient, any wealth transferred to them should ultimately pass through to consumers. If the competitors are not efficient, then not all of the wealth transfer will flow through to consumers. In this case, the opportunity cost is the difference between the cost savings achieved by consumers as a result of unbundled network element platform regulation and the cost savings consumers would have achieved under alternative policies that transfer wealth directly to consumers, such as reductions in access charges or universal service assessments.

Table 4 estimates the efficiency of the wealth transfer to consumers in the four states, using Table 2's adjusted figures for savings to competitors' customers. For each telephone line served by a competitor, the wealth transfer to the competitor is equal to the incumbent's revenues per access line, reduced by the price of the unbundled network element platform and the estimated retail costs that the incumbent avoids when it loses a line to a platform-based competitor.⁷² Table 4's total wealth transfer figure is simply the incumbent's lost revenues per line multiplied by the number of residential lines served by platform-based competitors.

The table reveals that in most cases, a substantial portion of the wealth transfer to competitors fails to reach consumers. Figure 2 graphically illustrates this gap. The principal exception is the near-total passthrough that occurs under the California "aggressive" scenario, which assumes that all of the savings on packages can be attributed to competition from platform-based competitors.

That does not mean that platform-based competitors merely pocketed the rest of the wealth transfer as profit. Thomas W. Hazlett offers a simple explanation of why many competitive entrants eventually failed to benefit from the wealth transfers created by price regulation: open entry forced the competitors to compete away any excess profits.⁷³ The money expended by competitors to capture the wealth transfer was used for many purposes. To the extent that competitors offered lower prices or new services that consumers could not get from the incumbent, some of the wealth transfer actually flowed through to consumers. To the extent that competitors spent money to develop services or sales efforts that consumers simply did not value, then the money was simply wasted. Similarly, much of the competitors' and incumbent's expenditures on legal services, economic studies, and engineering models used to contest the wealth transfers must also be classified as a cost of regulation. The fact that the stock market values competitors' assets at pennies on the dollar suggests that competitors have captured little of the transfer as profit.⁷⁴

⁷² For Illinois and Michigan, local revenues per access line are equal to the incumbent's average price for a local package reported in ICCT (2003) and MACT (2003). Since the packages in Braunstein's studies of California and New Jersey include long-distance service, local revenues per line were taken from "UNE-P vs. 271 LD Entry: What's the real tradeoff for the RBOCs?" Ex Parte Submission from Joan Marsh, AT&T, to FCC, WC Docket No 01-338 (Sept. 25, 2002). Estimates of unbundled network element prices and avoided costs are from this document as well. These estimates of unbundled network element prices are consistent with the widely-reported survey results in Gregg (2002). The principal difference is that the former includes transport and amortization of non-recurring costs, while the latter does not. Thus, the AT&T figures lead to a slightly lower estimate of wealth transfers from incumbents to competitors.

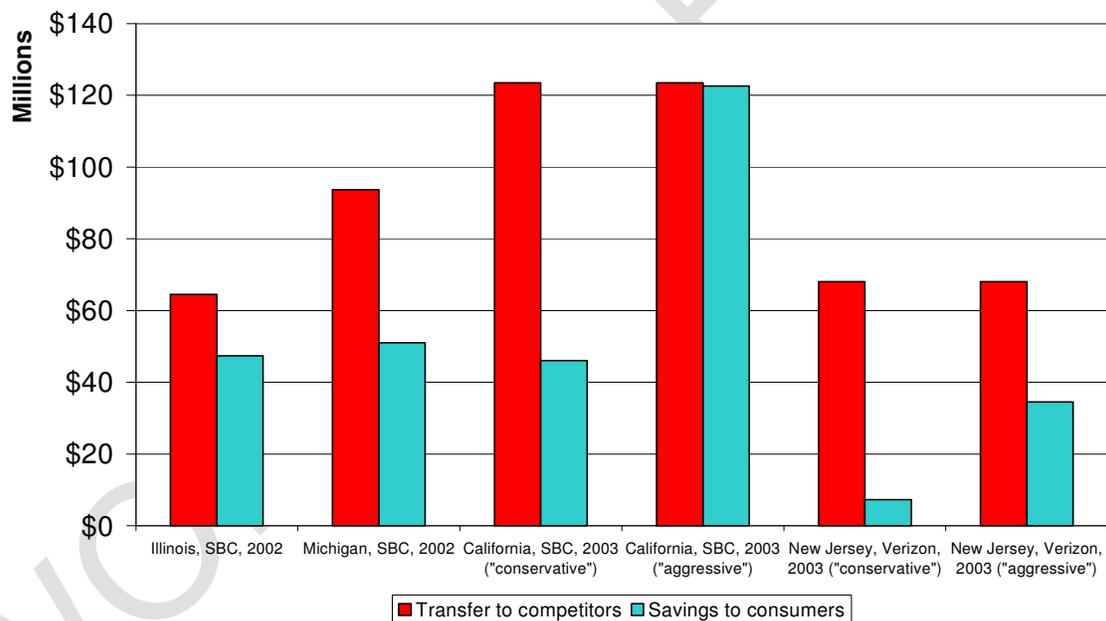
⁷³ Thomas W. Hazlett, "The Irony of Regulated Competition in Telecommunications," *Columbia Science and Technology Review* 4, (2003): 10-13. Available at <http://www.stlr.org/html/volume4/hazlett.pdf>.

⁷⁴ Larry F. Darby, Jeffrey A. Eisenach, and Joseph S. Kraemer, "The CLEC Experiment: Anatomy of a Meltdown," *Progress on Point* 9.23 (September 2002): 2. Available at <http://www.pff.org/publications/communications/pop9.23clecexperiment.pdf>.

Table 4: Efficiency of wealth transfer under network element platform regulation

State, incumbent, year	Incumbent revenue lost per line	Total transfer to competitors	Savings of competitors' Customers	Difference in wealth transfers	Customer avg. as % of wealth Transfer
Illinois, SBC, 2002	\$15.03	\$64,522,708	\$47,436,854	\$17,085,853	74
Michigan, SBC, 2002	\$13.34	\$93,695,624	\$51,062,008	\$42,633,616	54
California, SBC, 2003 ("conservative")	\$7.83	\$123,516,339	\$46,062,288	\$77,454,052	37
California, SBC, 2003 ("aggressive")	\$7.83	\$123,516,339	\$122,569,854	\$946,485	99
New Jersey, Verizon, 2003 ("conservative")	\$9.07	\$68,091,066	\$7,282,065	\$60,809,000	11
New Jersey, Verizon, 2003 ("aggressive")	\$9.07	\$68,091,066	\$34,533,506	\$33,557,559	51

Figure 2: Inefficient wealth transfers



Consumer surplus. The consumer surplus component of the opportunity cost arises because alternative ways of transferring wealth to consumers may have different effects on consumer surplus than unbundled network element regulation.

To the extent that regulated platform rates are below the competitive level, local telephone service requires larger cross-subsidies if incumbents are to maintain investment in the network. These cross-subsidies require higher prices on other services, in the form of access charges, universal service assessments, or other distortionary measures. The

price increases will reduce consumption of the affected services, and the resulting reduction in consumer surplus is an opportunity cost of unbundled network element regulation.

If regulated platform rates are at or above the competitive level, they still entail an opportunity cost in terms of consumer surplus. Instead of transferring wealth to consumers via competitors, policymakers could have achieved the transfer by reducing access charges, universal service assessments, or other measures that generate revenues for cross-subsidies. The price reductions associated with such policies would increase consumption of the affected services, and consumer surplus would increase as a result. This increase in consumer surplus that policymakers forego by regulating the price of unbundled network elements instead of reducing excessive charges on other services is an opportunity cost of unbundled network element regulation.

The size of these opportunity costs will vary, depending on which policy alternative one chooses for comparison. Two obvious alternatives that suggest themselves are reductions in long-distance access charges and reductions in universal service contributions assessed against wireless and interstate long-distance services.

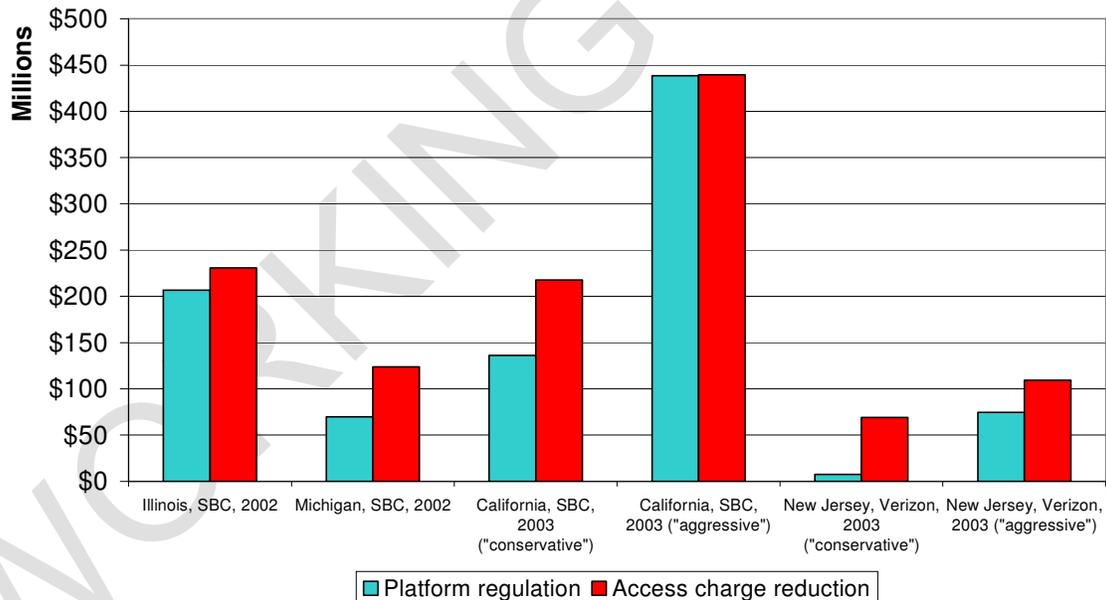
Total effect on consumer welfare. Using data from the state studies and Table 4, it is possible to estimate the total opportunity cost of unbundled network element platform regulation. Table 5 presents estimates based on a comparison to long-distance access charge and universal service assessment reductions. The table takes the size of the wealth transfer from incumbents to competitors and consumers by unbundled network element regulation as the starting point. It then calculates how that wealth transfer would affect consumer surplus and total consumer welfare if it were achieved through a reduction in access charges and universal service assessments imposed on long-distance service. The total consumer welfare gain from this alternative policy is then subtracted from the total consumer welfare gain attributed to unbundled network element platform regulation to calculate the net benefit or cost of platform regulation.

The calculations underlying Table 5 translate the total wealth transfer into a percentage reduction in the per minute long-distance rates, and then use a demand elasticity of -0.7 to calculate the change in consumer surplus. The total consumer welfare gain is the opportunity cost to consumers of transferring wealth through unbundled network element platform regulation. Subtracting this amount from the total consumer welfare gain in Table 3 shows the net effect on consumer welfare of platform regulation. In all cases except the California “aggressive” scenario, platform regulation generates a substantial consumer welfare loss compared to reducing inflated long-distance prices. As Figure 3 shows, regulators could create more consumer benefits by reducing access charges or universal service assessments than by transferring an equivalent amount of wealth to competitive local exchange carriers.

Table 5: Reduced long-distance access charges or assessments as an opportunity cost of unbundled network element platform regulation

State, incumbent, year	Effect of reducing access charges			Net consumer welfare effect of UNE platform regulation	
	Wealth transfer from incumbent	Consumer surplus gain	Consumer welfare gain	Total	Per line
Illinois, SBC, 2002	\$191,298,913	\$39,311,671	\$230,610,584	-\$23,794,498	-\$6.81
Michigan, SBC, 2002	\$105,839,624	\$17,885,245	\$123,724,870	-\$54,140,413	-\$19.44
California, SBC, 2003 ("conservative")	\$211,081,850	\$6,551,343	\$217,633,192	-\$81,379,834	-\$7.11
California, SBC, 2003 ("aggressive")	\$414,185,185	\$25,224,216	\$439,409,401	-\$1,061,637	-\$0.09
New Jersey, Verizon, 2003 ("conservative")	\$68,091,066	\$887,012	\$68,978,078	-\$61,685,875	-\$13.29
New Jersey, Verizon, 2003 ("aggressive")	\$107,128,792	\$2,195,642	\$109,324,434	-\$34,718,478	-\$7.48

Figure 3: Consumer benefits of platform regulation vs. access charge/universal service contribution reduction



National cost estimate

The foregoing analysis examined the benefits and opportunity costs of platform regulation for residential consumers in the service territories of large incumbents in several states. It is not possible to perform a national comparison of the benefits and opportunity costs of unbundled network element platform regulation, due to a lack of good data on competitors' prices and consumer savings in each state. Likewise a complete national estimate of costs is not possible, in the absence of state-by-state data on incumbent price cuts that resulted from competition. Nevertheless, sufficient data exist to estimate very crudely the nationwide opportunity cost associated with the wealth transferred to platform-based competitors. The National Regulatory Research Institute's surveys of unbundled network element prices, AT&T's (2002) estimate of incumbents' avoided costs, and various FCC reports provide the data.

Table 6 presents the results. The first two columns estimate the amount of wealth transferred from incumbents to competitors by platform regulation. Unlike the state-based tables above, the calculations include all platform-based lines, not just those sold to residential customers. They assume that the amount of revenue at stake when the incumbent loses a line to a competitor is equal to average local revenues per line, which includes revenues from local services sold by the incumbent but not long-distance service. These figures underestimate the amount of the transfer, for two reasons. First, the figures omit the wealth transfers that occur in a number of smaller states for which the FCC does not report competitor line counts. Second, the figures measure only the wealth transfer from incumbents to competitors; they do not include any wealth transferred from incumbents to consumers when competition from platform-based competitors forces incumbents to reduce their own prices. A comparison of the wealth transfer figures in Tables 3 and 4 suggests that the total wealth transfer can be more than three times as large as the transfer to competitors when the incumbent's price reductions are included in the total. Nevertheless, the wealth transfers in Table 6 are substantial -- \$1.3 billion in 2002, and \$3.1 billion in 2003. The wealth transfer more than doubled in one year due to a decline in regulated platform prices, a 30 percent increase in platform-based lines, and an increase in incumbent revenues per line.

If used to reduce interstate long-distance access charges or universal service assessments, these wealth transfers would have cut the price of long-distance service by 4/10 of a cent in 2002 and 9/10 of a cent in 2003. These price reductions would have generated gains in consumer surplus as consumers used more long-distance service. The total consumer welfare gain is the sum of the wealth transfer and the consumer surplus gain. These figures suggest that the opportunity cost of platform regulation was about \$3.3 billion in 2003. Put differently, platform regulation did not benefit consumers on net unless it increased consumer welfare by more than \$3.3 billion, or about \$240 for each line furnished by competitors using the platform.

Table 6: Nationwide opportunity costs to consumers of unbundled network platform regulation

	Wealth transfer from incumbent		Consumer surplus gain	Consumer welfare gain	
	Total	Per competitor platform-based line		Total	Per competitor platform-based line
2002	\$1,326,138,446	\$138.42	\$26,340,716	\$1,352,479,162	\$141.17
2003	\$3,145,820,811	\$228.35	\$148,223,754	\$3,294,044,564	\$239.11

These figures measure one opportunity cost of platform regulation to consumers. However, they do not measure the entire opportunity cost to society as a whole. If long-distance access charges or universal service fees were reduced, telecommunications companies that sell these services would also benefit from increased sales. The companies benefit from these sales to the extent that the increased revenues exceed the additional costs. Conversely, the welfare of both companies and consumers falls when excessive charges increase long-distance rates. The change in consumer plus producer welfare that occurs as a result of these charges is the “excess burden” of raising the revenue that the charges produce. In a series of papers, Hausman has estimated the average excess burden associated with taxes and universal service assessments on long-distance and wireless service.⁷⁵ Each dollar raised through an assessment on long-distance has an average excess burden of at least 65 cents, and each dollar raised through an assessment on wireless has an average excess burden of 53 cents. These results make it possible to estimate a more complete measure of the opportunity cost of platform regulation that includes the entire change in excess burden, rather than just the change in consumer welfare.

Table 7 shows the combined opportunity costs to producers and consumers of transferring wealth via unbundled network element regulation rather than a reduction in universal service assessments on wireless and long-distance. The calculations assume that assessments against long-distance and wireless would each have been reduced by the same percentage. Comparing Tables 6 and 7, the social opportunity cost is 40 percent greater than the opportunity cost to consumers in 2002 and 50 percent larger in 2003.

⁷⁵ Jerry Hausman, “Efficiency Effects on the U.S. Economy from Wireless Taxation,” *National Tax Journal* 53:3 (Part 2, September 2000): 733-42; Jerry Hausman, “Taxation by Telecommunications Regulation,” in James M. Poterba (ed). *Tax Policy and the Economy*, Volume 12 (Cambridge: MIT Press for the National Bureau of Economic Research, 1998): 29-48.

Table 7: Nationwide social opportunity costs of unbundled network platform regulation

	Wealth transfer from incumbent		Consumer +	Consumer + producer welfare gain	
	Total	Per competitor platform-based line	producer Surplus gain	Total	Per competitor platform-based line
2002	\$1,326,138,446	\$138.42	\$825,388,569	\$2,151,527,015	\$224.58
2003	\$3,145,820,811	\$228.35	\$1,920,209,023	\$5,066,029,833	\$367.74

All of these opportunity cost estimates focus on unbundled network element platform regulation. Similar estimates are not possible for sale of individual network elements, due to a lack of good data on the costs that incumbents avoid when a competitor leases individual network elements. The platform estimates do, however, account for a large majority of competitor lines furnished using unbundled network elements— 71 percent in 2002 and 78 percent in 2003.⁷⁶

Opportunity costs and regulatory accounting

The foregoing suggests that the opportunity costs of platform regulation are substantial. The size of the opportunity costs of platform regulation is the same, regardless of whether the regulated prices are above, below, or equal to the competitive level. This occurs because the opportunity costs are characterized as the benefits associated with alternative ways of transferring wealth from incumbents to consumers.

The policy decision to redistribute wealth to consumers via unbundling means that policymakers forego the opportunity to redistribute that wealth via other means, such as direct reductions in access charges or universal service fees. These alternative policies would transfer wealth directly from incumbents to consumers, instead of first passing a portion of it through competitors using the unbundled network element platform. If the competitors are at least as efficient as the incumbent, then the entire amount of monopoly profit extracted from the incumbent should ultimately be transferred to consumers. If competitors are less efficient than the incumbent, then consumers will not receive all of the monopoly profit, because some of it will be used to subsidize inefficient competitors. The difference between the amount of wealth extracted from the incumbent and the amount received by consumers is (from the consumers' perspective) a net cost of unbundled network element regulation, compared to other, more direct ways of transferring the wealth. In addition, the price reductions forgone for other services would have increased social welfare by increasing output of those services, and this forgone increase in welfare should be counted as a cost of unbundled network element regulation.

But are these opportunity costs new, or are they already incorporated in previous studies of the effects of access charges and universal service funding?

⁷⁶ Federal Communications Commission, *Local Telephone Competition: Status as of December 31, 2003*, Industry Analysis and Technology Division, Wireline Competition Bureau (July 2004): Table 4.

If platform regulation merely redistributes the incumbent's monopoly profits (or forces a reduction in excessive costs), then no additional cross-subsidies are required to allow the incumbent to maintain the local telephone network. Platform regulation still entails an opportunity cost, because there are more efficient ways of redistributing that wealth to consumers. However, this opportunity cost would already be captured in estimates of the consumer welfare cost of existing cross-subsidy schemes. The most recent and extensive study finds that cross-subsidies from long-distance to local telephone service reduce economic welfare by between \$2.5 billion and \$7 billion, somewhat more than the deadweight loss associated with platform regulation.⁷⁷

Suppose, on the other hand, the incumbent was operating efficiently and earning no monopoly profits. In that case, the wealth transfer caused by platform regulation would have to be replaced by additional cross-subsidies if the incumbent is expected to maintain the local telephone network. These additional cross-subsidies would create additional reductions in consumer welfare, on top of those created by previously-existing cross-subsidies. In this case, the opportunity cost of platform regulation would be added to the existing costs of cross-subsidies.

A final possibility is that the incumbent had some monopoly profits or excess costs, but the size of the wealth transfer from platform regulation exceeds these. In that case, some of the opportunity cost of platform regulation would already be reflected in the costs of existing cross-subsidies, and some of the opportunity cost would correspond to additional cross-subsidies needed to ensure that the incumbent can maintain the network. Only a portion of the opportunity cost would be added to the other costs of telecommunications regulation.

The bulk of published academic research suggests that TELRIC prices calculated with FCC cost models are 19-67 percent below competitive levels, depending on the specific network element. These results imply that the platform prices mandated by state regulators are also likely below the competitive level, though it is not clear how much below. Therefore, at least some of the opportunity cost calculated in this study is a new cost, in addition to previously-estimated inefficiencies of access charges and universal service policies.

The available data do not permit calculation of the nationwide benefits of platform regulation. The principal benefits would likely come in the form of lower retail prices. Calculations employing data from several large states with significant platform competition suggest that platform regulation transfers wealth to consumers much less efficiently than a direct reduction in access charges and universal service assessments.

Competition often offers nonprice benefits, such as innovative new services, but such benefits are unlikely to occur under platform regulation. Since competitors leasing the platform do not build their own local facilities, platform regulation offers them no opportunity to offer local services different from those offered by the incumbent. In

⁷⁷ Crandall and Waverman (2000): 120.

theory, platform regulation might eventually open the door to innovative new services if competitors use the platform as a transitional strategy to enter the market before building their own facilities. In practice, empirical research shows that platform regulation has precisely the opposite effect because it serves as a substitute for facilities-based competition. Either the “transition” theory is wrong, or platform regulation has not been given enough time to work.

In March 2004, federal courts struck down the FCC’s unbundled network element regulations because regulators failed to enunciate clear criteria for determining which network elements the incumbents must make available to competitors. In August 2004, the FCC issued a notice announcing interim measures while it takes another shot at revising the rules. While it is not clear whether the bundled network element platform will survive, it is clear that platform regulation carries substantial opportunity costs.



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