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Author : Dr. Jerry Ellig
Organization : Mercatus Center at George Mason Univ.
Mailing Address :
Attached Files : 05-05859-33043-ATT-1.doc

Comment : The FCC should be commended for recognizing the imperative of intercarrier compensation reform and advancing bill and keep as an economically rational alternative. The current patchwork of intercarrier payments generates hidden subsid that harm consumers by distorting prices and encouraging waste. There is virtually r evidence that these subsidies remedy a market failure. Replacing intercarrier payme with subscriber charges would make consumers better off, even if the change were revenue-neutral for local exchange carriers. Replacing intercarrier payments with universal service support, on the other hand, could perpetuate price distortions and c inefficiencies unless the funding sources and subsidy structure are significantly different from the current universal service programs.
Given these realities, the FCC can best advance consumer welfare in this proceedin through the following steps:
1) Eliminate subsidies embedded in current access charges and other intercarrier payments.
2) Adopt bill and keep as the most straightforward and effective way of accomplishi this goal.
3) Utilize bill and keep, and any associated regulations defining interconnection poi as default rules. Permit carriers to contract for alternative arrangements if they are mutually beneficial.
4) If any terminating access charges are retained, encourage private solutions to the terminating access monopoly problem by permitting interexchange carriers to pass terminating access charges back to the calling party.
5) Continue to treat Internet Protocol-based services that do not interconnect with th public switched telephone network as information services. Refrain from requiring them to interconnect with the telephone network or participate in the cross-subsidy

system that pervades the telephone network.

6) Promote competition in local telephone service by deregulating subscriber line charges, so that rates can rise to reflect costs.

7) Base any test for deregulating subscriber line charges on an assessment of whethe the incumbent has the ability to raise prices above some relevant measure of cost, ra than the current below-cost rates paid by many residential consumers.

8) If lost revenues are to be replaced by universal service subsidies, fund the subsidi in ways that distort prices the least, and phase them out by a date certain.

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REGULATORY STUDIES PROGRAM

Public Interest Comment on
Unified Intercarrier Compensation[1]

The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP conducts careful and independent analyses employing contemporary economic scholarship to assess rulemaking proposals from the perspective of the public interest. Thus, this comment on the Federal Communications Commission's Further Notice of Proposed Rulemaking on unified intercarrier compensation does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of the commission's proposals on overall consumer welfare.[2]

I. Introduction

A variety of carriers comprise the U.S. telecommunications industry. Traditional categories, which are fast breaking down, include incumbent local exchange companies, interexchange carriers, and wireless service providers. Local phone companies include large incumbents, small and rural incumbents, newer wireline competitors, and cable telephony providers. More recently, "Voice Over Internet" providers have emerged as "all-distance" competitors; some of them interconnect with the wireline telephone network.[3]

Various regulations and charges govern interconnection between these different networks. Some carriers, such as long-distance companies, pay access charges to the

[1] Prepared by Jerry Ellig, senior research fellow, Mercatus Center. This comment is one in a series of Public Interest Comments from Mercatus Center's Regulatory Studies Program and does not represent an official position of George Mason University.

[2] Federal Communications Commission, *In the Matter of Developing a Unified Intercarrier Compensation Regime*, Further Notice of Proposed Rulemaking, CC Docket No. 01-92 (Adopted Feb. 10, 2005; Released March 3, 2005). Hereinafter the "Further Notice."

[3] Some, however, are separate networks that connect only their customers who communicate with each other via the Internet. See *In the Matter of Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications nor a Telecommunications Service*, WC Docket No. 03-45 (adopted Feb. 12, 2004).

local companies that originate and terminate calls.[4] For other interconnecting carriers, the calling party's carrier compensates the called party's carrier that transports and completes the call.[5] Voice Over Internet providers pay no access charges, but purchase their connections to the switched telephone network at business rates.[6] Thus, the rates different carriers pay each other when they hand off calls can vary greatly—from almost nothing per minute to about 8.9 cents per minute for interstate calls.[7] Access charges for intrastate long-distance calls can be as high as 36 cents per minute.[8] The incremental cost of switching and terminating calls is measured in tenths of a cent,[9] so intercarrier compensation often creates hidden subsidies from some companies' customers to others.

In April 2001, the FCC initiated the current proceeding with a Notice of Proposed Rulemaking.[10] Both the FCC and many commenters note that the current crazy quilt of intercarrier charges simply cannot be sustained in an ever more competitive and innovative market.[11] Surely they are correct, but the current proceeding can also be viewed in a complementary, historical light.

This proceeding is the next logical step in a series of FCC actions stretching over two decades that have substantially enhanced consumer welfare. Since the AT&T breakup, the FCC has undertaken numerous initiatives to make hidden subsidies in telephone rate structures more transparent, reduce the absolute amount of the subsidies, and remove usage-based charges for services whose costs are largely fixed. Consumers have benefited tremendously as a result.

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[4] The FCC established access charges paid by AT&T to local carriers in 1983, in preparation for AT&T's divestiture of its local phone companies. *See 1983 Access Charge Order*, 93 FCC 2d at 245-54. The FCC subsequently reduced access charges multiple times, replacing them with the federal subscriber line charge and payments from the federal universal service fund. *See* Further Notice, paras. 6-11.

[5] *See* Further Notice, paras. 12-14.

[6] In so doing, they help subsidize local residential service, because business rates (at least for small and medium-size businesses) tend to be much higher than residential rates even though the cost of providing the service is similar. *See* Robert W. Crandall and Leonard Waverman, *Who Pays for Universal Service?* (Washington, DC: Brookings, 2000): 47.

[7] *Ex Parte Brief of the Intercarrier Compensation Forum in Support of the Intercarrier Compensation and Universal Service Reform Plan*, CC Docket No. 01-92, Appendix C: 2.

[8] *Ex Parte Brief of the Intercarrier Compensation Forum in Support of the Intercarrier Compensation and Universal Service Reform Plan*, CC Docket No. 01-92, Appendix C: 2. See also figures for Texas reported in Robert W. Crandall and Jerry Ellig, "Texas Telecommunications: Everything's Dynamic Except the Pricing," Texas Public Policy Foundation Research Report (January 2005): 38. Available at www.TexasPolicy.com.

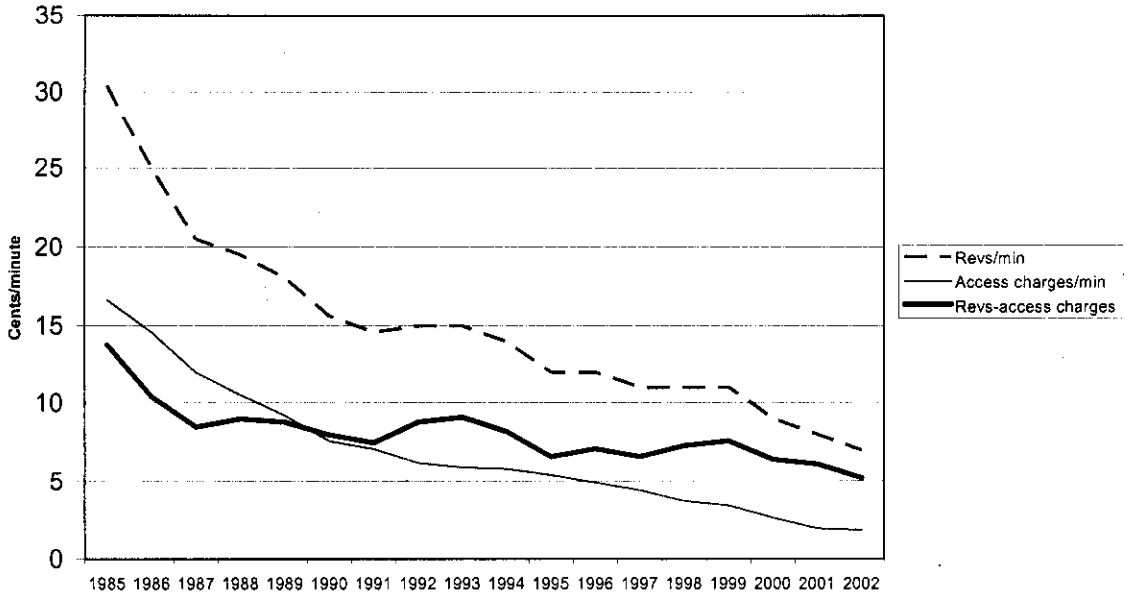
[9] See, e.g., switching rates calculated in Billy Jack Gregg, "A Survey of Unbundled Network Element Prices in the United States," National Regulatory Research Institute (Aug. 2004).

[10] *Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92, Notice of Proposed Rulemaking, 16 FCC Rcd 9610 (2001).

[11] *See* Further Notice, paras. 1-3, and references cited therein.

The accompanying graph, for example, shows how per-minute long-distance access charges and rates fell between 1985 and 2002. In the late 1980s, the access charge regime reduced U.S. economic welfare by $10-17 billion annually.[12] A 1996 study found that the welfare loss had declined substantially, to between $2.5 billion and $7 billion.[13] A more recent estimate suggests that by 2002, the annual welfare loss had shrunk to $1.5 billion – still substantial, but far below its level in the mid-1980s.[14] These improvements are directly attributable to the FCC's access charge reductions.

Long distance revenues net of access charges



FCC, Telecommunications Industry Revenues (2002), p. 30

The FCC now has the opportunity to deliver substantial consumer benefits by reforming intercarrier compensation. The following recommendations would help produce an intercarrier compensation system that creates the most benefits for consumers:

[12] Robert W. Crandall, *After the Breakup: U.S. Telecommunications in a More Competitive Era* (Washington, DC; Brookings Institution, 1991): 141.

[13] Crandall and Waverman (2000): 120.

[14] Jerry Ellig, "Costs and Consequences of Federal Telecommunications and Broadband Regulations," Mercatus Center Working Paper (February 2005): 16-17. Available at http://www.mercatus.org/regulatorystudies/article.php/1074.html.

1) Eliminate subsidies embedded in current access charges and other intercarrier payments.

2) Adopt bill and keep as the most straightforward and effective way of accomplishing this goal.

3) Utilize bill and keep, and any associated regulations defining interconnection points, as default rules. Permit carriers to contract for alternative arrangements if they are mutually beneficial.

4) If any terminating access charges are retained, encourage private solutions to the terminating access monopoly problem by permitting interexchange carriers to pass terminating access charges back to the calling party.

5) Continue to treat Internet Protocol-based services that do not interconnect with the public switched telephone network as information services. Refrain from requiring them to interconnect with the telephone network or participate in the cross-subsidy system that pervades the telephone network.

6) Promote competition in local telephone service by deregulating subscriber line charges, so that rates can rise to reflect costs.

7) Base any test for deregulating subscriber line charges on an assessment of whether the incumbent has the ability to raise prices above some relevant measure of cost, rather than the current below-cost rates paid by many residential consumers.

8) If lost revenues are to be replaced by universal service subsidies, fund the subsidies in ways that distort prices the least, and phase them out by a date certain.

II. What Market Failure Does the Current System Address?

Regulation can enhance consumer welfare when it remedies a market failure more effectively than alternative solutions. When reforming intercarrier compensation, the FCC would do well to keep in mind precisely what type of market failure it is trying to fix. Regulation of interconnection and intercarrier charges could address three possible market failures: network effects, call externalities, and the terminating access monopoly. The available evidence suggests that, while these factors may justify some type of regulation, none justifies using intercarrier compensation to subsidize local telephone service.

A. Network effects

The current system of intercarrier charges is intended to promote universal service. The assumed public benefit is that more people subscribe to phone service because intercarrier payments are used to subsidize monthly local rates. These subsidies may

address a market failure, reflecting the internalization of a genuine externality, under three conditions:

> 1. The value of telephone service to each subscriber rises when other subscribers join the network,
>
> 2. This increase in value is large enough that current subscribers would be willing to subsidize these new subscribers, and
>
> 3. Individuals fail to take this increased value into account when they decide whether to subscribe.[15]

Given the near-universality of telephone service in the United States today, it is questionable whether any significant network externalities remain that regulators could capture by subsidizing those few households not yet on the network. The more likely public interest reason for the subsidies is that policymakers may believe that an increase in telephone subscription rates is a good outcome even if there is no externality.[16]

Even if there are some externalities, subsidization through regulation may not be necessary, because the owner of the network has strong financial incentives to maximize the value of the network by crafting subsidies to new subscribers.[17] Early in the last century, one of the major factors driving telephone penetration was the desire of competing telephone companies, which did not interconnect, to offer their subscribers a larger calling network.[18] In less regulated communications markets, firms frequently offer inducements for signing up to the network.[19] In the future, a similar dynamic may develop in regard to Internet Protocol-based communications services that do not connect to the public switched telephone network. Regulators could actually stifle the development of such alternative networks if they require interconnection with the public switched telephone network and bring these services under the regulatory and cross-subsidy umbrella that covers telephone service. The FCC's pulver.com decision gives cause for optimism on this count, since it classifies a service that helps its own customers

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[15] The first condition defines the existence of an externality. The second condition determines whether it is a "Pareto-relevant marginal externality," an often-overlooked precondition for a subsidy or regulatory action to improve consumer welfare. A.H. Barnett and David L. Kaserman, "The Simple Welfare Economics of Network Externalities and the Uneasy Case for Subscribership Subsidies," *Journal of Regulatory Economics* 13 (1998).

[16] John C. Panzar, "A Methodology for Measuring the Costs of Universal Service Obligations," *Information Economics and Policy* 12 (2000): 213.

[17] Stanley J. Leibowitz and Steve Margolis, "Network Effects," in M. Caves, S. Majumdar, and I Vogelsang (eds.), *Handbook of Telecommunications Economics* (Elsevier, 2002): 76-94.

[18] Milton J. Mueller, *Universal Service* (Cambridge: MIT Press, 1997): 22-27.

[19] Jay M. Atkinson and Christopher C. Barnekov, "A Competitively Neutral Approach to Network Interconnection," FCC Office of Plans and Policy Working Paper # 34 (December 2000): paras. 55-56; available at http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp34.pdf.

make voice calls to each other over the Internet without connecting to the public switched telephone network as an unregulated information service.[20]

Regardless of whether network externalities now exist in telephone service, most research suggests that cross-subsidies from long-distance to local service generate little increase in telephone subscriptions. Consumer decisions to subscribe to telephone service are not very sensitive to the fixed monthly charge.[21] In other words, local service has a relatively low price elasticity of demand. This elasticity appears to have fallen over time. Several recent studies using census data, for example, have found that the elasticity in 1999 was about one-third of the value in 1970, and in 2000 it was only one-eighth of the 1970 value.[22] It may even equal zero in the United States and other developed countries.[23] Studies using a variety of statistical techniques find very little evidence that the cost of monthly service affects telephone penetration rates, even for low-income households.[24] Given these findings, the current system of intercarrier payments, which subsidize local wireline phone rates, would have to be classified as a relatively ineffective way of correcting for any network externalities that might exist.

B. Call externalities

This is primarily offered as a justification for requiring the calling party's network to pay the called party's network for interconnection. The reasoning is that the calling party causes the costs associated with the call but may not bear the full costs, because he or she may not be a customer of the called party's network. The called party (and the called party's network) have little or no recourse to prevent the costs from occurring—other than simply refusing to answer the phone. The caller thus creates costs for other parties that the caller does not bear, but there is no guarantee that the called party will receive a benefit commensurate with the cost. To make the caller take these costs into account, the calling party's network charges the caller's network for completing the call. The rates the caller pays his or her own phone company will roughly reflect these costs, thus more or less internalizing the externality.

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[20] FCC, *In the Matter of Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications nor a Telecommunications Service*, WC Docket No. 03-45 (adopted Feb. 12, 2004).

[21] Barnett and Kaserman (1998): 252-53; M. H. Riordan, "Universal Residential Telephone Service," in Martin E. Cave, Sumit K. Majumdar, and Ingo Vogelsang (Eds.), *Handbook of Telecommunications Economics, Volume 1* (Amsterdam: Elsevier, 2002): 431; David L. Kaserman, John W. Mayo, and Joseph E. Flynn, "Cross-Subsidization in Telecommunications" Beyond the Universal Service Fairy Tale," *Journal of Regulatory Economics* 2 (Sept. 1990): 231-49.

[22] Christopher Garbacz and Herbert G. Thompson, "Estimating Demand with State Decennial Census Data from 1970-1990," *Journal of Regulatory Economics* 21:3 (2002): 326; Christopher Garbacz and Herbert G. Thompson, "Estimating Telephone Demand with State Decennial Census Data from 1970-1990: Update with 2000 Data," *Journal of Regulatory Economics* 24:3 (2003): 376.

[23] Crandall and Waverman (2000): 91; Christopher Garbacz and Herbert G. Thompson, Jr., "Universal Telecommunication Services: A World Perspective," *Information Economics and Policy* (forthcoming 2005): 4, and Table 5.

[24] Crandall and Waverman (2000): 94-104.

The first thing to note about this potential market failure is that it does not justify a flow of subsidies from the calling party's network to the called party's network. At most, it justifies cost-based payments sufficient to internalize the externality.

It is also worth noting that some of the highest and most significant intercarrier charges never quite followed the "calling party pays" principle. Ever since the FCC instituted long-distance access charges, long-distance companies have had to pay at both ends of the call. When a caller places a long-distance call using a wireline phone from a local phone company, the caller's local network does not pay the long-distance company; it receives a payment from the long-distance company. This practice suggests that the principal motivation for and effect of access charges was not to remedy call externalities, but rather to extract subsidies from long-distance users for the benefit of local phone companies and customers who do not use much long-distance service.[25]

In today's environment, call externalities probably don't justify any payments from the calling party's network. The FCC cogently points out that advances in technology and policy now give call recipients substantial control over what calls they will take. Caller ID allows the called party to screen incoming calls and accept only those that are wanted. Unlisted and unpublished numbers give people differing degrees of ability to keep their phone numbers private. Wireless phone numbers are not published. The National Do-Not-Call List allows people to avoid receiving certain types of unwanted telemarketing calls. Other services, such as call pre-screening and automated voicemail attendants, give consumers even greater control over which calls they will take. Now more than ever, customers have the ability to avoid receiving phone calls that they do not want. Most completed calls likely benefit the recipient as well as the caller. The caller may impose costs on the called party, but the call confers benefits as well.[26] As a result, any externality that may once have existed is likely minimal.[27]

C. Terminating access monopoly

A final market failure proffered to justify regulation of intercarrier compensation is the "terminating access monopoly." At any point in time, the carrier that connects the individual subscriber to the rest of the telephone network has a monopoly over access to that individual. An unregulated monopolist could exploit this position by charging all other carriers high rates to terminate calls to its customers. Retail competition may not

[25] It is true that the customer initiating the long-distance call has a retail relationship with the long-distance company, and in that sense the long-distance company is the calling party's network that initiates the call. If one examines the actual path of the phone call in a wireline system, it is clear that the call passes from the caller's local phone company to the long-distance company, and thence to the called party's local phone company.

[26] As the FCC notes, "This increased ability of consumers to avoid calls for which they may not perceive a benefit (e.g., telemarketing calls) means that they generally will benefit from calls they choose to accept." Further Notice, para. 27.

[27] The FCC staff reaches a similar conclusion. See Further Notice, Appendix C: 99-102.

curb this practice, because the callers ultimately paying the termination charges are not customers of the network that imposes the charges.[28]

Pre-existing regulation exacerbates the terminating monopoly problem. Mandatory interconnection gives connecting carriers no choice but to pay the terminating monopolist. In the absence of mandatory interconnection, a firm that charged excessive termination rates could well find that other carriers simply decline to interconnect. Limited interconnection would place this firm at a competitive disadvantage when it vied for customers against competing firms that offer customers access to more people on other networks.

This does not mean that voluntary interconnection would necessarily eliminate the terminating access monopoly problem. But it does illustrate how the decision to require interconnection is, of necessity, also a decision to exacerbate the terminating access monopoly problem.

Laws and regulations that prevent itemized passthrough of termination charges also inhibit voluntary solutions to terminating access monopoly. The situation facing long-distance carriers illustrates the general problem. Federal law and regulation require that interexchange carriers offer rural customers the same rates as urban customers and charge the same rates in all states.[29] These requirements force long-distance carriers to average access charges over all customers.

In the absence of such requirements, the long-distance companies could flow excessive terminating access charges back to the customer who placed each call. Customers who did not want to bear the cost of receiving a lot of calls from people on other networks could choose to subscribe to networks that impose high terminating access charges. Customers who want to receive a lot of calls from people on other networks would have strong incentives to subscribe to a network that imposes low terminating access charges. Retail competition between networks would help keep terminating access charges low for that segment of customers who desire low terminating access charges.

This scenario may perhaps seem fanciful, requiring consumers to process a great deal of information and spend time finding the combination of monthly subscription charge and terminating access charges that best meets their needs. The prospect is less fanciful when one considers the complex pricing and service schemes that consumers actually evaluate in the telecommunications marketplace:

- Both long-distance and wireless providers offer "buckets" of various quantities of minutes that require users to watch their usage in order to avoid extra charges. The calling plans often include reduced-price (or, in some cases, free) night and weekend minutes, prompting consumers to alter their calling patterns if they want to lower their bills or gain greater value from their wireless service.

[28] Further Notice, para. 24.

[29] Further Notice, para. 83.

- Long-distance and wireless companies have offered free and/or discounted calling between individuals who subscribe to the same network (e.g., "Friends and Family," "Calling Circles," and "Free In-Network Calling.") To capitalize on these plans, consumers need to know which network the people they are calling subscribe to, and they may urge people they call frequently to switch networks in order to lower their costs.

- The same customer's wireless rates can vary, depending on whether the customer is using the company's facilities or "roaming" on another company's network. To avoid roaming charges, the consumer needs to understand where his or her network provides service with its own facilities and where it has roaming agreements with other carriers.

- Both wireless and wireline phone subscribers have responded to long-distance plans that make a specified quantity of (or unlimited) long-distance service available at zero incremental cost per minute.

The success of such initiatives in the marketplace suggests that consumers are quite aware and capable of tracking costs and prices that vary based on time of day, type of call, and identity of the person called—when the prices they face make it worth their while to do so. Many also respond when networks offer reduced rates or premiums for bringing others into the network. This experience suggests that network owners and consumers alike would devote a great deal of initiative to defeating the terminating access monopoly, if only the consumers received accurate price signals that would enable them to determine which calls generate excessive access charges.

The foregoing analysis does not prove that deregulation and voluntary initiative will more effectively remedy the terminating access monopoly than regulation, but it gives cause for hope. At a minimum, it suggests that the FCC should remove regulatory barriers preventing private actions that could help deal with the problem.

One opportunity appears where the Further Notice asks whether there are circumstances under which the FCC should forbear from imposing rate averaging and rate integration requirements on interexchange carriers. The FCC's goal is to avoid placing long-distance carriers serving the national market at a disadvantage compared to carriers offering long-distance service mainly outside of rural areas. The terminating access monopoly problem presents another circumstance in which the FCC should consider forbearance. The FCC should forbear from requiring rate averaging and rate integration when such forbearance is necessary to allow market-based solutions to the terminating access monopoly problem. If, for example, a long-distance carrier proposes a pricing program that would pass terminating access charges back to the party that initiates each call, along with clear disclosure of the source of the charges, such passthroughs should not be prohibited by the rate averaging and rate integration requirements.

III. Reform Could Benefit Consumers Significantly

The FCC seeks comment on how reductions in long-distance access charges would affect consumers. The FCC invites comments assessing how consumers would be affected if access charges were replaced with additional subscriber charges (such as increased federal subscriber line charges).[30] Finally, the FCC also asks whether "revenue neutrality" should be a goal of any intercarrier compensation reform.[31]

Economic analysis suggests that replacing long-distance access charges with subscriber charges would benefit consumers substantially, even if the switch is designed to be "revenue neutral" for carriers. Revenue neutrality, however, may not produce the maximum possible benefits for consumers.

The current intercarrier compensation system harms consumers in several ways. Contrary to well-understood principles of regulatory economics, intercarrier payments often tax price-sensitive services to subsidize non-price-sensitive services, recover fixed and sunk costs through usage-based charges, and create incentives for waste and inefficiency.[32]

Long-distance access charges provide the most significant example of these problems. The highest per-minute intercarrier compensation rates appear to be those that the long-distance companies pay to local companies. The average ranges from 0.6 cents per minute paid to large incumbent local exchange carriers for interstate calls, all the way to 5.1 cents per minute paid to small incumbent local exchange carriers for intrastate calls. The averages can mask substantial variation. Large incumbent local exchange carriers receive anywhere from 0.5 cents to 1.5 cents per minute for interstate calls, and small competitive local exchange carriers receive compensation ranging from 0.4 to 35.9 cents per minute for intrastate calls.[33]

A. Price-sensitive services are taxed to subsidize non-price-sensitive services

Access charges transfer wealth from consumers who use a lot of long-distance service to local phone companies and, to some extent, consumers who mostly use local service. But they are more than just wealth transfers. Long-distance access charges harm consumers by taxing a price-sensitive service in order to subsidize a service whose use is not very sensitive to price. As a result, the charges reduce use of long-distance service while generating little increase in subscriptions to local service.

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[30] Further Notice, para. 106.

[31] Further Notice, para. 99.

[32] For a classic exposition of the general principles, see Alfred E. Kahn, *The Economics of Regulation* (New York: John Wiley and Sons, 1970 and 1971), Volume 1, Chs. 3-5, and Volume 2, Chs. 2-3.

[33] *Ex Parte Brief of the Intercarrier Compensation Forum in Support of the Intercarrier Compensation and Universal Service Reform Plan*, CC Docket No. 01-92, Appendix C: 2.

When an artificial price increase leads consumers to cut back on consumption by a large amount, it makes consumers substantially worse off.[34] The most recent extensive study that measures these welfare impacts was published by the Brookings Institution in 2000. Depending on the specific model and assumptions, elimination of cross-subsidies from long-distance to local service increases consumer welfare by between $1 billion and $3.7 billion annually. Long-distance companies gain an additional $1.6-3.4 billion annually, yielding a total increase in economic welfare of between $2.5 billion and $7 billion.[35] The figures are net calculations that include changes in welfare due to the price increases for local service.

A rough updated estimate can be calculated using national average data for 2002. Interstate access charges averaged between 1 cent and 1.6 cents per domestic conversation minute and generated approximately $3.3 billion in revenues.[36] In 2002, there were 333.8 billion domestic conversation minutes, and average revenue per minute was 7 cents. The incremental cost of access is measured in tenths of a cent, so most of the access charge subsidizes local telephone service.[37] A 1-cent interstate access charge takes about $3.3 billion from consumers who use long-distance service, reduces consumer welfare by another $300 million because consumers use less long-distance service, and reduces producer welfare by about $1.2 billion because producers sell less long-distance service.[38]

Similarly, intrastate access charges generate significant consumer costs. State policies vary, but one recent study using 2002 Texas data illustrates the potential consumer gains from intrastate access charge reform. Texas intrastate switched access charges averaged 7.68 cents per minute, and the largest incumbent received 5.83 cents per minute. Reducing the four largest incumbents' intrastate access charges to 1 cent per minute (0.5 cents at each end of the call) would generate $445 million in consumer gains annually due to lower long-distance rates while increasing local rates by only $356 million, for a net consumer gain of $89 million annually. The net consumer gain occurs because the access charge reduction lowers the costs of long-distance service, whose demand is

[34] Most studies find that the price elasticity of demand for long-distance service is relatively large, in a range between -0.5 and -0.72; a 1 percent increase in long-distance prices reduces use by about one-half to three-quarters of one percent. A consensus estimate of the elasticity is -0.7; see Riordan (2002): 436. See also 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.

[35] Using 1996 data, Crandall and Waverman (2000) first employed several different cost models to estimate how much additional revenue local phone companies would earn if they could eliminate cross-subsidies and price local phone service at incremental cost. They then estimated the effect on long-distance prices and economic welfare if these additional revenues were used to reduce long-distance access charges.

[36] FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, *Telecommunications Industry Revenues* (2004), Table 10, reports that in 2002, interstate access charges per domestic conversation minute averaged 1 cent, and access charges per interstate 2-ended minute averaged 1.6 cents.

[37] See, e.g., Gregg (2004).

[38] Ellig (2005): 16-17.

sensitive to price, while raising the cost of local service, whose demand is not sensitive to price.[39]

Surveying the findings of multiple studies, Jerry Hausman and Howard Shelanski note,

> A comparison of price elasticities of demand for local and long-distance telephone services thus reveals that an increase in long-distance prices is probably more harmful to society's economic welfare than is an increase in local service prices. Long-distance demand, with a price elasticity of -0.7, will contract substantially more in the face of a price increase than will local-service demand, with a price elasticity of -0.005.[40]

These differing elasticities suggest that cross-subsidies from long-distance to local service may at best generate small increases in telephone subscription at the cost of a large reduction in consumer welfare due to inflated long-distance prices.

Yet even this tradeoff may be an illusion. Higher long-distance rates tend to reduce telephone subscription, since consumers subscribe to local phone service in part so that they can make long-distance calls. Some studies find that subscription is more sensitive to changes in long-distance rates than to changes in local rates. Therefore, a reduction in the cross-subsidy from long-distance to local rates may actually increase telephone penetration. The principal study examining these offsetting effects estimated that the reduction in cross-subsidies that the FCC ordered between 1984 and 1990 actually increased telephone penetration rates by 0.45 percent, bringing 450,000 additional households onto the telephone network.[41]

Studies of phoneless households also suggest that access charges may undermine the goal of universal service. The most common reason that phoneless households give for not subscribing to telephone service is concern about uncontrollable usage-based charges, not the cost of basic local service. A 1994 study of low-income households in New Jersey found that the cost of usage-related charges and optional services—such as long-distance, collect calls, calling-card calls, and voice mail—were the most common reasons that households lacked phone service. Heads of households noted that other family members or friends living with them had run up large usage-related bills in the past, often without their knowledge or approval. The authors concluded, "Income, employment, and other measures of wealth or poverty are strongly related to low penetration not because the

[39] Crandall and Ellig (2005): 21-24.

[40] Hausman and Shelanski (1999): 39.

[41] Jerry Hausman, Timothy Tardiff, and Alexander Belinfante, "The Effects of the Breakup of AT&T on Telephone Penetration Rates in the United States," *American Economic Review* 83 (May 1993): 182-83. Garbacz and Thompson (2002, 2003) also find that higher long-distance prices reduce telephone penetration rates, and the size of the effect falls between 1970 and 2000. This is a logical finding, given the large reductions in long-distance prices that occurred over that period.

price of basic local phone service is too high, but because low-income users who run up large usage-related bills are unable to cover them."[42]

A 1995 survey of Texas households without telephones found that about half of them said the cost of local service makes it difficult to afford a telephone, but about 80 percent said they could afford to pay $16 per month, the actual average cost of local service in Texas at the time of the survey. The primary barriers to phone service were the fact that long-distance charges are variable and hence perceived as harder to control, the cost of reinstallation for people who previously had service disconnected due to nonpayment of bills, and difficulty in controlling who uses the phone.[43]

In short, the policy of cross-subsidizing local rates with revenues from long-distance access charges generates little increase in telephone subscription rates, and may even reduce them.

Other intercarrier charges may also distort prices and generate costs for consumers. Payments from wireless providers to incumbent local exchange companies, for example, average 0.6 cents per minute for certain types of traffic, and can be as high as 8.9 cents per minute.[44] Like long-distance service, demand for wireless service is relatively responsive to price, with U.S. demand elasticity most recently estimated in the range of -1.12 to -1.29.[45] Some estimates using international data are even higher, in the range of -1.71 to -3.62.[46] These findings suggest that taxing wireless service to subsidize wireline service harms consumers in the same way that taxing long-distance service does, only more so. Cost figures for long-distance access charges should, therefore, be taken as a

[42] Milton L. Mueller and Jorge Reina Schement, "Universal Service from the Bottom Up: A Study of Telephone Penetration in Camden, New Jersey," *The Information Society* 12 (1996): 287.

[43] John B. Horrigan and Lodis Rhodes, *The Evolution of Universal Service in Texas* (Sept. 1995), available at www.apt.org/policy/lbjbrief.html.

[44] *Ex Parte Brief of the Intercarrier Compensation Forum in Support of the Intercarrier Compensation and Universal Service Reform Plan*, CC Docket No. 01-92, Appendix C: 2.

[45] J. Gregory Sidak, "Is State Taxation of the Wireless Industry Counterproductive?," manuscript, Criterion Economics (April 2, 2003). Sidak used 1999-2001 data. Using 1988-93 U.S. data, Hausman estimates a demand elasticity of approximately -0.5. See Jerry Hausman, "Cellular Telephone, New Products, and the CPI," *Journal of Business & Economic Statistics* 17:2 (April 1999): 191. A 2002 study using data from 2000 and 2001 estimated that the overall price elasticity of demand is -0.6. Mark Rodini, Michael R. Ward, and Glenn A. Woroch, "Going Mobile: Substitutability Between Fixed and Mobile Access," paper prepared for conference organized by the Public Utility Research Center at the University of Florida (Dec. 2002).

[46] Thomas W. Hazlett and Roberto E. Muñoz, "A Welfare Analysis of Spectrum Allocation Policies," AEI-Brookings Joint Center for Regulatory Studies related Publication 04-18 (Aug. 2004): 15; Gary Madden and Grant Coble-Neal, "Economic Determinants of Global Mobile Telephony Growth," *Information Economics and Policy* 16 (2004): 531. Using 1996-2001 data for developed countries, Garbacz and Thompson (forthcoming, Table 5) find a price elasticity of -0.45 with respect to the monthly charge. An earlier study, however, found that connection prices, monthly subscription charges, and the cost of a 3-minute call rarely had statistically significant effects on the national subscription rate to wireless. Hyungtaik Ahn and Myeong-Ho Lee, "An Econometric Analysis of the Demand for Access to Local Telephone Networks," *Information Economics and Policy* 11 (1999): 297-305.

lower-bound estimate of the costs generated by the current intercarrier compensation arrangements.

B. Fixed costs are recovered through usage-based charges

Even if current intercarrier compensation arrangements created no subsidies, they would still create some price distortions that harm consumers. This is because most of the costs of interconnection and switching are fixed, but intercarrier payments are often per-minute charges. As the Further Notice notes, "It appears ... that most network costs, including switching costs, result from connections to the network rather than usage of the network itself. This development in infrastructure calls into question whether intercarrier compensation mechanisms based on per-minute charges remain appropriate or necessary."[47]

Usage-based charges that recover fixed costs create price distortions that diminish economic welfare by causing consumers to use less of the service. Suppose, for example, that current interstate long-distance access charges merely cover local phone companies' incremental costs of switching calls to and from long-distance companies. There would be no subsidy from interstate long-distance to local service, but the per minute charges would still distort consumer decisions. Consumer welfare would still be $300 million lower each year, and producer welfare would still be $1.2 billion lower each year, compared to what they would be if these costs were recovered through a fixed charge instead of a usage-based charge.

C. Intercarrier subsidies encourage waste and inefficiency

In addition to price distortions, subsidies channeled through intercarrier compensation can create other forms of waste and inefficiency. As a result, it is unlikely that the full amount of subsidy taken from one group of consumers actually reaches the intended beneficiaries.

One form of waste affects all types of carriers. When wealth transfers are available, organized interests will expend resources to obtain them through lobbying, litigation, and other activities intended to influence regulators' and legislators' decisions. From a society-wide perspective, money spent purely to capture wealth transfers is often considered waste. In some circumstances, the total amount of money wasted may even exceed the size of the wealth transfer.[48] It is unclear how much of the billions of dollars' worth of intercarrier compensation are expended to influence governmental processes rather than reduce prices for the consumers who are supposed to benefit from the

[47] Further Notice, para. 23; see also paras. 66-70.

[48] Michael Crew and Charles Rowley, "Toward a Public Choice Theory of Monopoly Regulation," *Public Choice* 57 (1988): 49-67; Gordon Tullock, "The Welfare Costs of Tariffs, Monopolies, and Theft," reprinted in James Buchanan, Robert Tollison, and Gordon Tullock, *Toward a Theory of the Rent-Seeking Society* (College Station: Texas A&M University Press, 1980).

subsidies. Research on other telecommunications regulations, however, suggests that the waste could be substantial.[49]

A second form of waste affects the carriers that are still subject to rate-of-return regulation. On average, local exchange carriers under rate-of-return regulation receive 10 percent of their revenues from interstate access charges and 16 percent from intrastate access charges.[50] Rate-of-return regulation often distorts the regulated firm's choice of inputs, so the regulated firm fails to produce at minimum cost.[51] Rate-of-return regulation also reduces entrepreneurial incentives to squeeze out unnecessary costs and undertake valuable but risky innovation.[52] The resulting rates might be considered "just and reasonable," because they reflect costs, but the costs themselves are inflated. In such an environment, some subsidies merely cover artificially inflated costs, rather than lowering prices for consumers. The actual amount of waste is unknown, but one consultant's report concluded that many of the incumbent phone companies subject to rate-of-return regulation have substantial inefficiencies.[53]

For these reasons, it would be a mistake to conclude that all, or substantially all, of the subsidy created by the intercarrier compensation system actually redounds to the benefit of the consumers it is supposed to help.

An intercarrier compensation system that maximizes benefits to consumers should, therefore, do three things:

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[49] For example, a Mercatus Center working paper finds that unbundled network element platform regulation transferred approximately $3.1 billion from incumbent phone companies to competitive local exchange carriers in 2003. Data from several large states where competitors made heavy use of the platform suggest that the competitors' customers received only a fraction of the wealth transfer. See Jerry Ellig and James N. Taylor, "The Opportunity Costs of Unbundled Network Element Regulation," Mercatus Center Working Paper (November 2004), available at http://www.mercatus.org/pdf/materials/980.pdf.

[50] Further Notice, para. 107.

[51] Leon Courville, "Regulation and Efficiency in the Electric Utility Industry," *Bell Journal of Economics* 5 (Spring): 53-74; Paul M. Hayashi and John M. Trapani, "Rate of Return Regulation and the Regulated Firm's Choice of Capital-Labor Ratio: Further Empirical Evidence on the Averch-Johnson Effect," *Southern Economic Journal* 42 (January 1976): 384-97; H. Craig Petersen, "An Empirical Test of Regulatory Effects," *Bell Journal of Economics* 6 (1975): 111-26; Robert M. Spann, "Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis," *Bell Journal of Economics* 5 (Spring): 8-52; E. Ray Canterbery, Ben Johnson, and Don Reading, "Cost Savings from Nuclear Regulatory Reform: An Econometric Model," *Southern Economic Journal* (Jan. 1996): 554-66.

[52] Israel Kirzner, "The Perils of Regulation: A Market Process Approach," in *Discovery and the Capitalist Process* (University of Chicago Press, 1985): 119-49.

[53] The study, conducted for Western Wireless, concluded that rural incumbent local exchange carriers' corporate operations expenses total $545 million (33 percent) higher than they would be if all of these companies were as efficient as the top-performing 25 percent of companies in each size-based group. See *Lost in Translation: How Rate of Return Regulation Transformed the Universal Service Fund for Consumers into Corporate Welfare for the RLECs* (Boston, MA: Economics and Technology Inc., February 2004): 37-40.

(1) Avoid taxing price-sensitive services to subsidize services that are not sensitive to price.

(2) Recover fixed costs through charges that do not vary with usage.

(3) Eliminate or reduce cross-subsidies. Any subsidies that remain should be structured to discourage waste and inefficiency.

IV. Analysis of Reform Proposals

The FCC has before it two types of reform proposals. "Bill and keep" proposals would reduce intercarrier payments to zero, and each carrier would recover its own costs from its own customers. The Intercarrier Compensation Forum and Western Wireless submitted bill and keep proposals that include some per-minute access charges during a transition period.[54] Various other proposals would retain the "calling party's network pays" approach, but in the context of a unified and simplified system. Some, such as the proposals from the Alliance for Rational Intercarrier Compensation, the Cost-Based Intercarrier Compensation Coalition, and the National Association of State Utility Consumer Advocates, retain per-minute charges.[55] Home Telephone Company and PBT Telecom propose connection charges in place of per-minute charges.[56] The Expanded Portland Group proposes per-minute charges during a transition period but eventually substitutes capacity-based charges.[57]

A. Bill and keep vs. calling party's network pays

A bill and keep approach could avoid taxing price-sensitive services, recover fixed costs through fixed rather than usage-based charges, and eliminate hidden cross-subsidies. Bill and keep has the potential to accomplish all three goals by eliminating intercarrier payments for access. It is likely to accomplish all three goals as long as carriers, when billing their own customers, cover their own interconnection costs through fixed charges on services whose demand is not very sensitive to price. Both the Intercarrier Compensation Forum and the Western Wireless proposals are consistent with this last principle, because they envision increases in the fixed federal subscriber line charge to partly offset the revenues local carriers would lose due to the elimination of intercarrier payments.[58]

[54] Further Notice, paras. 40-44; 54. CTIA – The Wireless Association also submitted a list of principles that includes support for bill and keep; see para. 59.

[55] Further Notice, paras. 48-51; 56. Principles submitted by the National Association of Regulatory Utility Commissioners also appear to permit per-minute charges; see paras. 57-58.

[56] Further Notice, para. 52-53.

[57] Further Notice, paras. 45-47.

[58] Further Notice, paras. 42, 54.

A reformed calling party's network pays approach could, in theory, accomplish the three goals equally well—but only if regulators could accurately estimate the interconnection costs that each carrier imposes on every other carrier, and then establish fixed charges to recover these costs. The Expanded Portland Group and Home Telephone/PBT Telecom proposals appear to move the furthest toward replacing per-minute charges on price-sensitive services with fixed charges, since they eliminate per-minute charges in favor of capacity-based charges. Whether these plans would effectively squeeze out hidden subsidies depends on how well the resulting charges accurately reflect interconnection costs.

In practice, bill and keep is much more likely to promote consumer welfare, because it removes regulators from the contentious and error-prone task of setting interconnection rates.[59] When a carrier installs equipment needed to interconnect with other carriers whose interconnection volumes will likely vary in the future, it is far from obvious how much of the cost of the equipment could be said to be "caused" by each of the other carriers' variable (and arguably unknown) interconnection needs. This is, of course, an example of the more general difficulty of determining whose use "caused" fixed joint and common costs. The ensuing arguments tend to focus as much on fairness and other social goals as on cost causation, which makes the ratemaking process ripe for perpetuation of hidden subsidies.[60] If there are no intercarrier payments for interconnection, then intercarrier payments cannot be used to provide hidden subsidies.

Bill and keep does require regulators to demarcate interconnection points. The location of these points has real cost consequences for carriers, and arguments over interconnection points will no doubt be vigorous and time-consuming, as the FCC recognizes.[61]

In some cases, a carrier may not wish to bear the costs of building its own facilities to interconnect with another carrier at the point designated by regulators. In such cases, a carrier might purchase transport services from another carrier. The FCC seeks comment on a variety of issues relating to regulation of transit service.[62] If there is insufficient competition in transit services, regulation of transit rates may still be required. Critics might contend that bill and keep merely transfers the price regulation issue from interconnection to transit. This regulation, however, is likely to be less pervasive and durable than the regulation of interconnection rates that would be required under a calling party's network pays approach. Regulation would occur only where insufficient

[59] Jonathan E. Nuechterlein and Philip J. Weiser, *Digital Crossroads: American Telecommunications Policy in the Internet Age* (Cambridge, MA: MIT Press, 2005): 321; Patrick DeGraba, "Bill and Keep at the Central Office as the Efficient Interconnection Regime," FCC Office of Plans and Policy Working Paper No. 33 (December 2000): paras. 91-93; available at http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp33.pdf.

[60] See, e.g., Crew and Rowley (1988).

[61] Further Notice: para. 91.

[62] Further Notice, paras. 120-133.

competition exists, and the scope of such regulation would likely decrease as competition increases.[63]

It is, of course, possible that in some cases the bill and keep rule, along with the designated interconnection points, may not be the optimal way of governing interconnection between two or more carriers. Such instances might increase as telecommunications competition and technology evolve. For this reason, carriers should be free to negotiate alternative compensation arrangements or interconnection points. As FCC staff have suggested, bill and keep, and the designated interconnection points, should be defaults only, not compulsory.[64] If carriers find it in their interest to negotiate other arrangements, the FCC should not prevent them from doing so.

B. The role of subscriber charges

Regardless of whether the FCC reduces hidden subsidies by adopting bill and keep or a reformed calling party's network pays approach, it will face the issue of raising or deregulating subscriber charges to make up for the subsidies that local telephone companies would likely lose. In the Further Notice, the FCC asks whether there is sufficient competition to permit elimination of the subscriber line charge price cap. The Further Notice even suggests that some carriers may not be able to raise their subscriber line charges high enough to replace the subsidies they would lose if the FCC reduced or eliminated access charges.[65]

At the outset, it is important to recognize a potential pitfall in assessing whether the market for phone service is sufficiently competitive to permit deregulation of subscriber line charges. Antitrust agencies often assess whether a firm has market power, defined as "the ability profitably to maintain prices above competitive levels for a significant period of time."[66] In analyzing the likely effects of mergers, antitrust enforcers often use the observed pre-merger price as a proxy for the competitive price. In ordinary competitive markets, where sellers do not normally sell below cost, this is a reasonable assumption.

Regulation, on the other hand, often holds the residential price of local wireline phone service *below* the competitive level. The price of local wireline service is usually below the long-run incremental cost of providing wireline service in all but the most dense urban areas.[67] To assess whether an incumbent phone company has market power,

[63] Nuechterlein and Weiser (2005): 324; DeGraba (2000): para. 121. The FCC staff analysis of bill and keep makes a similar point in its consideration of replacing intercarrier payments with end-user charges. See Further Notice, Appendix C: 106-09.

[64] DeGraba (2000): paras. 29-33; Atkinson and Barnekov (2000): para. 1.

[65] Further Notice, para. 101.

[66] U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines* (Issues April 2, 1992, Revised April 8, 1997), available at http://www.usdoj.gov/atr/public/guidelines/hmg.htm.

[67] Crandall and Waverman (2000): 112 reach this conclusion using a variety of cost models that have been proffered in FCC proceedings. Crandall and Ellig (2005): 40-41, using the FCC's Hybrid Cost Proxy Model, find that residential rates charged by the four largest incumbent phone companies in Texas fall $600

therefore, one must determine whether the firm has the ability to raise price significantly above a relevant measure of cost, rather than current regulated levels.

Even if deregulation of subscriber line charges would lead to price increases, incumbent phone companies may lack the ability to charge supra-competitive prices. The price increases may merely move retail prices to their genuine, unsubsidized, competitive level. Even prior to passage of the 1996 Telecom Act, researchers found that alternative local loop technologies, such as cellular, PCS wireless, fixed wireless, and cable telephony, had about the same average cost per subscriber in urban areas as the incumbent local exchange carriers' wireline technology.[68]

When incumbent phone companies are free to charge prices that cover costs, competition will often constrain their ability to raise prices above cost. A December 2003 study by the Progress and Freedom Foundation finds that when competition shifts from "plain old telephone service" to packages of local, long-distance, and vertical calling features, consumers often have attractive competitive alternatives to the packages offered by incumbent local exchange carriers. In the Washington, DC, area, for example, multiple carriers offered packages that included residential local, local toll, long-distance, and multiple vertical services for about $50 per month. Carriers included the incumbent (Verizon), a broadband service provider (RCN/Starpower), several wireless providers, and a competitive local exchange carrier using the unbundled network element platform (MCI). Similar findings emerged in case studies of Idaho, Utah, Texas, Ohio, and Massachusetts. In many cases, competitive packages with all the same features but limits on peak or long-distance minutes were available for substantially less than the incumbent's package.[69]

These findings should not be surprising, since service packages typically allow the incumbent to combine below-cost local voice service with other deregulated (or at least higher-margin) services. Even if the a la carte price of local service is regulated below cost, the retail price of the entire package covers its costs. As one might expect, competition is much more feasible when the incumbent is not forced to sell below cost.

Deregulating the subscriber line charge would allow incumbent local exchange carriers to charge prices that at least cover costs. In most cases, competition would likely be strong enough to prevent incumbents from charging prices that substantially exceed costs. If the FCC decides to apply a test before deregulating individual carriers' subscriber line charges, that test should assess whether the incumbent can raise prices significantly above the unsubsidized levels that would exist in competitive markets—not the

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million short of covering the long-run incremental cost of residential lines. On average, rates fail to cover costs for about 95 percent of lines.

[68] Robert W. Crandall and Leonard Waverman, *Talk Is Cheap: The Promise of Regulatory Reform in North American Telecommunications* (Washington, DC: Brookings Institution, 1995): 255.

[69] Richard O. Levine, Joseph S. Kraemer, and Randolph J. May, "Trends in the Competitiveness of Telecommunicaitons Markets: Implications for Deregulation of Retail Local Services," Progress & Freedom Foundation Special Report (December 2003): 59, 91-131.

artificially low regulated prices that many residential consumers pay for basic phone service today.

V. Universal Service Issues

Many of the reform proposals discussed in the Further Notice suggest using universal service funding to replace revenues that some phone companies could lose as a result of intercarrier compensation reform. The FCC asks whether and how this should be done.[70]

Replacing lost subsidies with universal service support would increase transparency, one of the goals of the 1996 Telecom Act. There is precedent for such measures. When the FCC reduced long-distance access charges paid to large local carriers under the CALLS Order and smaller carriers under the MAG Order, it also created new universal service support mechanisms to help make up for the lost subsidies.[71]

Beyond the transparency benefit, replacing intercarrier compensation with universal service support may do little to promote consumer welfare. There are two principal reasons. First, the current funding mechanism for the Universal Service Fund distorts prices in a similar manner to per-minute intercarrier compensation charges. Second, the payment of universal service subsidies to phone companies creates incentives for inefficiency and waste similar to those created by current intercarrier compensation arrangements. Replacing intercarrier payments with universal service support could only improve consumer welfare if the new funding mechanism and payment methods were significantly different from current universal service programs.

A. Current universal service funding distorts prices

Federal universal service funds come from contributions levied as a percentage of carriers' interstate and international revenues. Three of the major telecommunications services that contribute to the universal service fund—domestic interstate long-distance, international, and wireless—are often sold by the minute, or in packages containing various numbers of minutes. This means that carriers' revenues are often proportional to the number of minutes that customers choose to buy. A percentage tax on revenues is thus roughly proportional to the number of minutes. Carriers are highly likely to pass this tax through to consumers as a charge that varies based on the number of minutes (or the size of the "buckets" of minutes) that they buy. Therefore, universal service contributions act as a tax on minutes purchased.

As such, they have effects on consumer welfare similar to the effects of access charges. This funding mechanism for universal service programs generates substantial consumer costs in addition to the revenue it raises to fund universal service. This occurs because

[70] Further Notice, paras. 101-11.

[71] Further Notice, paras. 9-11.

the contribution mechanism acts as a tax on services with relatively high price elasticities of demand, such as long-distance and wireless.[72]

A recent Mercatus Center study estimates the economic welfare losses generated by universal service assessments on long-distance and wireless service, using FCC data from 2002. For domestic interstate long-distance, federal universal service contributions averaged 0.8 cents per conversation minute. This price increase raised approximately $2.7 billion in revenues, but it also reduced consumption of long-distance service. As a result, the price increase reduced consumer welfare by about $240 million and reduced producer welfare by about $920 million, for a total reduction in economic welfare of $1.16 billion.[73]

Universal service assessments on interstate wireless service raised approximately $1.4 billion in 2003.[74] Combining available 2003 data on wireless subscribership, the universal service assessment percentage, and universal service contributions from wireless with 2002 data on minutes and revenues per minute yields a consumer welfare loss of $39 million and a producer welfare loss of $835 million, for a total reduction in economic welfare of $874 million.[75]

Shifting the subsidy burden from access charges to the Universal Service Fund thus shifts from a tax on one price-sensitive service to a tax on several services, most of whose demand is sensitive to price. Universal service assessments come from interstate long-distance, international, interstate wireless, and interstate local services. Substituting universal service funding for access charges shifts some of the burden to the portion of local telephone companies' costs classified as interstate; the resulting price increases would entail negligible welfare losses because the demand for local service is not very sensitive to price. However, this improvement is offset by the fact that the universal service fund also collects contributions from wireless service, whose demand is even more responsive to price than that of long-distance service. Hence, substituting universal service support for access charges under the current funding scheme would produce little consumer benefit, and may even make consumers worse off.

If the FCC decides to replace some or all lost access charge revenues with universal service payments, it can mitigate the economic welfare losses by funding these payments with contributions from services whose demand is not sensitive to price. The most commonly-discussed alternatives are assessments for each phone number or network connection.

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[72] See pp. 10-13 above.

[73] Ellig (2005): 20-21. Calculations employ data in FCC, *Telecommunications Industry Revenues* (2004), Table 10.

[74] These figures are calculated by multiplying total universal service outlays, shown in FCC, *Trends in Telephone Service* (2004), Table 19.1, by the percentage of contributions from wireless, shown in Table 19.15.

[75] Ellig (2005): 21-22.

Either alternative would give rise to some gamesmanship and competitive substitution. Indeed, perhaps the only suggested funding source that would not distort the prices of telecommunications service would be revenues from spectrum auctions![76] An assessment on phone numbers would create incentives for customers to minimize use of phone numbers in the North American Numbering Plan. An assessment on connections would create incentives to minimize connections—or game whatever system might be adopted to charge for different types of connections based on capacity or perceived value. The principal merit of these options is not that they leave the system free from price distortions, but that they may be less distortionary than the current funding mechanisms. The possibility that even these funding options could distort behavior is another strong argument for ensuring that the subsidies they fund are as small and as temporary as possible.

B. Universal service payments to carriers can promote waste and inefficiency

The federal government spent approximately $5.7 billion on universal service programs in 2003. More than half of this money—$3.3 billion—went to subsidize high-cost carriers, and $713 million (12.5 percent) was spent on programs for low-income customers that help pay initial connection charges (Linkup) and subsidize monthly phone bills (Lifeline). Most of the rest ($1.7 billion, or 30 percent) subsidized internal wiring, telecommunications, and Internet service to schools and libraries.[77] Thus, about 70 percent of the funds were devoted to subsidizing basic telephone service, with the remainder spent on the newer "universal service" programs created by the 1996 Telecommunications Act, which reduce the cost of Internet service to specified types of institutions.

The high-cost subsidies have the greatest potential to promote waste and inefficiency. Carriers receive high-cost subsidies by virtue of the fact that they have high costs. Consequently, these subsidies create little incentive for cost containment, and may well have the opposite effect.

Replacing access charges with universal service payments threatens to further weaken incentives for cost containment. The danger may be greatest in the case of smaller local exchange carriers. Data submitted by the Intercarrier Compensation Forum suggest that smaller local exchange carriers tend to receive higher access charges than large local exchange carriers.[78] Such carriers already have relatively weak incentives to control costs, because they are usually subject to rate-of-return regulation and sometimes heavily dependent on high-cost subsidies. Some rural carriers in Texas, for example, receive

[76] Jerry Hausman, "Taxation by Telecommunications Regulation," *Tax Policy and the Economy*12 (1998): 46.

[77] FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, *Trends in Telephone Service* (May 2004), Table 19.1.

[78] *Ex Parte Brief of the Intercarrier Compensation Forum in Support of the Intercarrier Compensation and Universal Service Reform Plan*, CC Docket No. 01-92, Appendix C: 2.

more than 60 percent of their revenues from federal and state universal service fund payments, and several count on these sources for three-quarters of their revenues.[79]

If the FCC decides to replace some or all lost access charges with universal service payments, it can encourage efficiency by offering limited subsidies that mimic the competitive market's incentives for cost reduction and value creation. The most practical means to accomplish this would be to offer such subsidies for only a limited amount of time, phased out according to a certain schedule. Like price cap (RPI-X) regulation that adjusts prices downward over time to reflect expected productivity increases, a phaseout of subsidies would allow consumers who pay the subsidies to benefit from expected productivity increases. The phaseout would also create strong incentives for recipient companies to find ways of reducing costs or increasing the value they deliver to customers.

VI. Conclusions and Recommendations

The FCC should be commended for recognizing the imperative of intercarrier compensation reform and advancing bill and keep as an economically rational alternative. The current patchwork of intercarrier payments generates hidden subsidies that harm consumers by distorting prices and encouraging waste. There is virtually no evidence that these subsidies remedy a market failure. Replacing intercarrier payments with subscriber charges would make consumers better off, even if the change were revenue-neutral for local exchange carriers. Replacing intercarrier payments with universal service support, on the other hand, could perpetuate price distortions and cost inefficiencies unless the funding sources and subsidy structure are significantly different from the current universal service programs.

Given these realities, the FCC can best advance consumer welfare in this proceeding through the following steps:

1) Eliminate subsidies embedded in current access charges and other intercarrier payments.

2) Adopt bill and keep as the most straightforward and effective way of accomplishing this goal.

3) Utilize bill and keep, and any associated regulations defining interconnection points, as default rules. Permit carriers to contract for alternative arrangements if they are mutually beneficial.

4) If any terminating access charges are retained, encourage private solutions to the terminating access monopoly problem by permitting interexchange carriers to pass terminating access charges back to the calling party.

[79] *Lost in Translation* (2005): 7.

5) Continue to treat Internet Protocol-based services that do not interconnect with the public switched telephone network as information services. Refrain from requiring them to interconnect with the telephone network or participate in the cross-subsidy system that pervades the telephone network.

6) Promote competition in local telephone service by deregulating subscriber line charges, so that rates can rise to reflect costs.

7) Base any test for deregulating subscriber line charges on an assessment of whether the incumbent has the ability to raise prices above some relevant measure of cost, rather than the current below-cost rates paid by many residential consumers.

8) If lost revenues are to be replaced by universal service subsidies, fund the subsidies in ways that distort prices the least, and phase them out by a date certain.

In a turn-of-the-21st century working paper outlining a bill and keep proposal, two FCC economists noted, "We do not seek an interconnection regime that will resolve all the problems of telecommunications. It would be a significant improvement to discover one that, unlike the current regimes, does not add new or compound old problems."[80] The recommendations above will not solve all the problems of telecommunications, but they will go a long way toward removing some of the worst problems created by legacy regulation.

[80] Atkinson and Barnekov (2002): para. 19.

APPENDIX I
RSP CHECKLIST

Element	Agency Approach	RSP Comments
1. Has the agency identified a significant market failure?	FCC discusses 2 of 3 potential market failures: call externalities and terminating access monopoly. **Grade: A**	Further Notice cites persuasive evidence that call externalities are no longer a problem justifying "calling party's network pays." Terminating access monopoly is mentioned, though the FCC fails to note how pre-existing regulation contributes to this problem. Network effects are not discussed, though this is not a serious omission since they are probably no longer significant for wireline telephone service in the U.S.
2. Has the agency identified an appropriate federal role?	Commission is clearly sensitive to federal and state roles, seeking comment on whether the FCC has authority to change intrastate access charge regimes. **Grade: A**	Given the history of federal-state jurisdictional issues in telecommunications, the FCC's decision to raise this issue is a courageous one, and the approach is appropriately cautious. A reasonable case could be made that number portability, wireless phone service, and Internet Protocol telephony have destroyed the distinction between interstate and intrastate telephone service.
3. Has the agency examined alternative approaches?	Further Notice seeks comment on numerous alternatives, except for complete deregulation of interconnection. **Grade: B**	FCC has sought comment on the full range of proposals likely to be politically feasible at this time. A discussion of deregulation, however, may have aided in fleshing out the fundamental issues that any regulatory solution would need to address. Unfortunately, the FCC seems less committed to the bill and keep alternative than it seemed to be in its 2001 Notice of Proposed Rulemaking.

Element	Agency Approach	RSP Comments
4. Does the agency attempt to maximize net benefits?	Economic efficiency is one of the explicitly articulated goals of this proceeding. **Grade: A**	The Further Notice is conducive to a discussion of net benefits. Many questions in the Further Notice are questions one would want to answer in order to maximize net benefits.
5. Does the proposal have a strong scientific or technical basis?	FCC is clearly concerned with understanding how technological change has altered cost causation, how regulation will affect incentives, and how to craft a new system that will be technologically and competitively neutral. **Grade: A**	The principal major omission from the FCC's analysis is a quantification of the simple economic point that taxing price-sensitive services to subsidize services whose demand is insensitive to price generates large reductions in consumer welfare.
6. Are distributional effects clearly understood?	The Further Notice and several accompanying commissioners' statements appear to assume that a reduction in subsidies, especially to rural phone companies, threatens universal service. **Grade: D**	If "universal service" means keeping people on the phone network, the discussion ignores the fact that elimination of subsidies would have virtually no effect on subscription because subscription is very insensitive to price. If "universal service" simply means preserving wealth transfers to rural consumers, most of the discussion ignores the fact that a great deal of the subsidy flows to telephone company investors, not consumers. A few questions do raise the possibility that rural phone companies need not be fully compensated for subsidies they would lose as a result of intercarrier compensation reform.
7. Are individual choices and property impacts understood?	The principal discussion related to property rights is in questions inquiring whether phone companies must be given alternative revenue streams if intercarrier subsidies are removed. **Grade: C**	Given the amount of litigation surrounding "deregulatory takings," it is probably prudent for the FCC to raise this question. But the issue is raised in an unfortunate way. An economically efficient intercarrier compensation reform would eliminate a system that extracted hidden, above-competitive charges from consumers for decades.