INTERCARRIER COMPENSATION AND CONSUMER WELFARE

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I. INTRODUCTION

The U.S. telecommunications industry includes a variety of carriers. 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 Protocol (VoIP)[1] providers have emerged as "all-distance" competitors; some of them interconnect with the wireline telephone network.[2]

Various regulations and charges govern interconnection between these different networks. Some carriers, such as long-distance companies, pay access charges to the local companies that originate and terminate calls.[3] For other interconnecting carriers, the calling party's carrier compensates the called party's carrier, which transports and completes the call.[4] VoIP providers pay no access charges but purchase their connections to the switched telephone network at business rates.[5]

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1. Voice over Internet Protocol enables telephone calls over data networks such as the Internet. *See, e.g.*, FCC, Voice-Over-Internet Protocol, http://www.fcc.gov/voip (last visited Dec. 17, 2005).

2. Some, however, are separate networks that only connect their customers who communicate with each other via the Internet. *See, e.g.*, Petition for Declaratory Ruling that Pulver.com's Free World Dialup Is Neither Telecommunications nor a Telecommunications Service, 19 F.C.C.R. 3307 paras. 4–7 (2004) [hereinafter Petition for Declaratory Ruling].

3. *See* MTS and WATS Market Structure, 93 F.C.C.2d 241, 245–54 (1983) (establishing access charges paid by AT&T to local carriers in 1983, in preparation for AT&T's divestiture of local phone companies). The FCC has reduced access charges multiple times, replacing them with the federal subscriber line charge and payments from the federal universal service fund. *See* Developing a Unified Intercarrier Compensation Regime, Further Notice of Proposed Rulemaking, 20 F.C.C.R. 4685 para. 9 (2005) [hereinafter Further Notice].

4. *See* Further Notice, *supra* note 3, para. 13.

5. *See generally Net Phones Ruled Exempt from State Rules*, ASSOC. PRESS, Nov. 9, 2004, www.msnbc.msn.com/id/6444477 (reporting that VoIP providers are no longer subject to state regulations, such as access charges). In so doing, VoIP providers help subsidize local residential

Thus, the rates that different carriers pay each other when they hand off calls can vary greatly—from almost nothing per minute to about $0.089 per minute for interstate calls.[6] Access charges for intrastate long-distance calls can be as high as $0.36 per minute.[7] The incremental cost of switching and terminating calls is measured in tenths of a cent,[8] so intercarrier compensation often creates hidden subsidies from some companies' customers to others.

In April 2001, the Federal Communications Commission (FCC) initiated a proceeding to reform and unify these intercarrier compensation arrangements.[9] The FCC sought comment on a Further Notice of Proposed Rulemaking (Further Notice) in March 2005.[10] Both the FCC and many commenters note that the current crazy quilt of intercarrier charges simply cannot be sustained in an increasingly competitive and innovative market.[11] Though surely they are correct, the intercarrier compensation proceeding also can be viewed in a complementary, historical light.

The proceeding was the next logical step in a series of FCC actions, stretching over two decades, which 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, to reduce the absolute amount of the subsidies, and to remove usage-based charges for services whose costs are largely fixed.[12] Consumers have benefited tremendously as a result.

Figure 1, 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.[13] A 1996 study found that the welfare loss had declined substantially, to between $2.5 billion and $7 billion.[14] A more recent estimate suggests that by 2002, the annual welfare loss had shrunk to $1.5

service because business rates (at least for small- and medium-sized businesses) tend to be much higher than residential rates even though the cost of providing the service is similar. *See* ROBERT W. CRANDALL & LEONARD WAVERMAN, WHO PAYS FOR UNIVERSAL SERVICE? WHEN TELEPHONE SUBSIDIES BECOME TRANSPARENT 47 (2000).

6. *See* Ex Parte Brief of the Intercarrier Compensation Forum in Support of the Intercarrier Compensation and Universal Service Reform Plan app. C at 2, *In re* Developing a Unified Intercarrier Compensation Regime, CC Docket No. 01-92 (Fed. Commc'ns Comm'n Oct. 5, 2004) [hereinafter ICF Brief], *available at* http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6516492297.

7. *Id.*

8. Jerry Ellig, Cost and Consequences of Federal Telecommunications and Broadband Regulations 17 (Feb. 2005) (working paper, *available at* http://www.mercatus.org/pdf/materials/1074.pdf).

9. Developing a Unified Intercarrier Compensation Regime, Notice of Proposed Rulemaking, 16 F.C.C.R. 9610, 9611 (2001).

10. Further Notice, *supra* note 3, para. 1.

11. *Id.* paras. 1–3.

12. *See id.* paras. 3–13 (outlining steps taken prior to and since the AT&T divestiture).

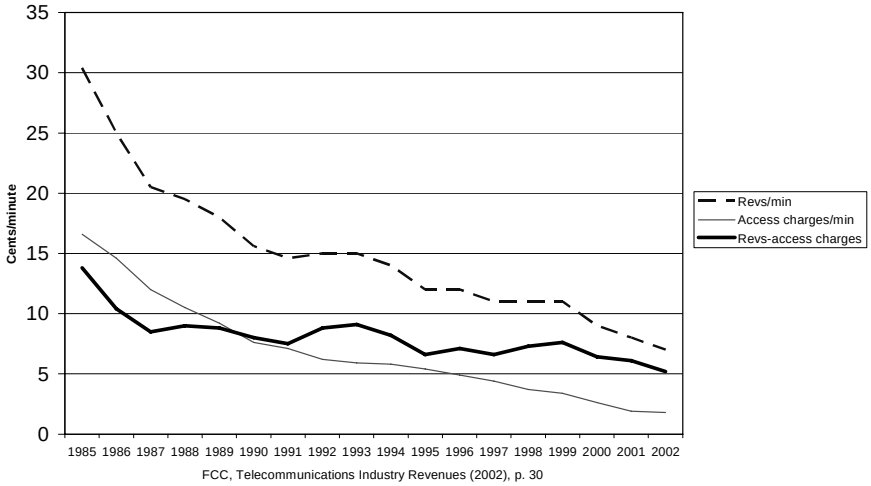
13. *See* ROBERT W. CRANDALL, AFTER THE BREAKUP: U.S. TELECOMMUCATIONS IN A MORE COMPETITIVE ERA 141 (1991).

14. *See* CRANDALL & WAVERMAN, *supra* note 5, at 119.

billion—still substantial, but far below its level in the mid-1980s.[15] These improvements are directly attributable to the FCC's access charge reductions.

Figure 1

Long distance revenues net of access charges



The FCC now has the opportunity to deliver additional consumer benefits through comprehensive intercarrier compensation reform. Given the complexity of the issues, any reform effort undoubtedly will involve significant further rulemaking and litigation. In the din of competing interests, it may be difficult to remain focused on what is arguably the most important goal: promotion of consumer welfare.[16] Even if reform incorporates other goals, decision makers need a solid analysis of consumer welfare so they can understand when other goals might conflict and identify tradeoffs.

This Article examines the impact on consumer welfare of the current system and several major elements of proposed reforms. Part II assesses the extent to which the current system may enhance consumer welfare by addressing a genuine market failure. Part III identifies the distortions and inefficiencies created by the current system. Part IV assesses elements of proposed reforms, and Part V concludes by offering some recommendations based on that assessment. If regulators, courts, and (dare we hope) interested parties can keep this analysis in mind, the ultimate result may yet make consumers better off.

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15. *See* Ellig, *supra* note 8, at 17; *see also id.* at 16 n.22 (explaining the method of calculating annual welfare loss).

16. The FCC made ample provision for consumer welfare considerations by articulating "efficiency" and "competition" as goals of reform. *See* Further Notice, *supra* note 3, para. 30.

II. WHAT MARKET FAILURES DOES THE CURRENT SYSTEM ADDRESS?

Regulation can enhance consumer welfare when it remedies a market failure more effectively than alternative solutions. 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 subsidize monthly local rates. These subsidies may address a market failure, reflecting the internalization of a genuine externality, under three conditions: first, the value of telephone service to each subscriber rises when other subscribers join the network[17]; second, this increase in value is large enough that current subscribers would be willing to subsidize these new subscribers[18]; and third, individuals fail to take this increased value into account when they decide whether to subscribe.[19]

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.[20]

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.[21] One of the major factors driving telephone penetration early in the last century was the desire of competing telephone companies, which did not interconnect, to offer their subscribers a larger calling network.[22] In less regulated communications markets, firms frequently offer inducements for signing

17. A.H. Barnett & David L. Kaserman, *The Simple Welfare Economics of Network Externalities and the Uneasy Case for Subscribership Subsidies*, 13 J. REG. ECON. 245, 246 (1999). This first condition defines the existence of an externality. *See id.* at 246.

18. *See id.* at 248. 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. *See id.* at 248–50.

19. *Id.* at 246.

20. *See* John C. Panzar, *A Methodology for Measuring the Costs of Universal Service Obligations*, 12 INFO. ECON. & POL'Y 211, 212–13 (2000).

21. *See* Stanley J. Leibowitz & Steve E. Margolis, *Network Effects*, *in* 1 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 75, 76 (Martin E. Cave et al. eds., 2002).

22. *See* MILTON L. MUELLER, JR., UNIVERSAL SERVICE 25–27 (1997).

up to the network.[23] 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, however, because the decision classifies as an unregulated information service a service that helps its own customers make voice calls to each other over the Internet without connecting to the public switched telephone network.[24]

Regardless of whether network externalities now exist in telephone service, most research suggests that subsidies from long-distance to local service generate little increase in telephone subscriptions.[25] Consumer decisions to subscribe to telephone service are not very sensitive to the fixed monthly charge.[26] 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 1990 was about one-third of the value in 1970, and in 2000 it was only one-eighth of the 1970 value.[27] Elasticity may even equal zero in the United States and other developed countries.[28] 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.[29] 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.

23. Jay M. Atkinson & Christopher C. Barnekov, *A Competitively Neutral Approach to Network Interconnection* 21 (FCC, Working Paper No. 34, 2000), *available at* http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp34.pdf.

24. Petition for Declaratory Ruling, *supra* note 2, at 3309–10.

25. *See* Barnett & Kaserman, *supra* note 17, at 252–53.

26. *See id.*; David L. Kaserman et al., *Cross-Subsidization in Telecommunications: Beyond the Universal Service Fairy Tale*, 2 J. REG. ECON. 231, 231 (1990); *see also* Michael H. Riordan, *Universal Residential Telephone Service*, *in* 1 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 423, 431 (Martin E. Cave et al. eds., 2002).

27. *See* Christopher Garbacz & Herbert G. Thompson, Jr., *Estimating Telephone Demand with State Decennial Census Data from 1970–1990*, 21 J. REG. ECON. 317, 326 (2002) [hereinafter Garbacz & Thompson, *Estimating Telephone Demand*]; Christopher Garbacz & Herbert G. Thompson, Jr., *Estimating Telephone Demand with State Decennial Census Data from 1970–1990: Update with 2000 Data*, 24 J. REG. ECON. 373, 376 (2003) [hereinafter Garbacz & Thompson, *Estimating Telephone Demand: Update*].

28. *See* CRANDALL & WAVERMAN, *supra* note 5, at 91; Christopher Garbacz & Herbert G. Thompson, Jr., *Universal Telecommunication Services: A World Perspective*, 17 INFO. ECON. & POL'Y 495, 506 (2005) [hereinafter Garbacz & Thompson, *Universal Telecommunication Services*].

29. *See* CRANDALL & WAVERMAN, *supra* note 5, at 94–104.

B. Call Externalities

Call externalities are primarily offered as a justification for requiring the calling party's network to pay the called party's network for interconnection.[30] The reasoning is that the calling party causes the costs associated with the call but may not bear the full costs because the individual may not be a customer of the called party's network.[31] 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.[32] 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.[33] To make the caller take these costs into account, the called party's network charges the caller's network for completing the call.[34] The rates the caller pays his or her own phone company will roughly reflect these costs, thus more or less internalizing the externality.

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 have 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; instead, 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.[35]

In today's environment, externalities probably do not 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.[36] Caller ID allows the called party to screen incoming calls and accept only those that are

30. *See* Further Notice, *supra* note 3, para. 17.
31. *Id.*
32. *See id.* paras. 25–27.
33. *See id.* para. 27.
34. *Id.* para. 13.
35. 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.
36. *See* Further Notice, *supra* note 3, para. 26.

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.[37] Other services, such as call pre-screening and automated voicemail attendants, give consumers even greater control over which calls they will take.[38] 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.[39] As a result, any externality that once may have existed is now likely minimal.[40]

C. Terminating Access Monopoly

A final market failure that may justify regulation of intercarrier compensation is the "terminating access monopoly."[41] 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 curb this practice because the callers ultimately paying the termination charges are not customers of the network that is imposing the charges.[42]

Economic theorists have identified two ways in which terminating access monopoly can ultimately harm retail customers. First, an established incumbent firm facing an entrant that initially serves only a small portion of the market can find it profitable to charge a very high access price that effectively curbs the entrant's ability to compete, thus cornering the market.[43] Second, access charges can facilitate collusion on retail prices when networks charge customers per call or by another unit of usage.[44]

Both of these problems, however, result from excessive access charges. The theoretical models that identify the terminating access monopoly's harmful effects on retail competition find that the socially optimal access charge is equal to the marginal cost of access or perhaps

37. *Id.* para. 25.

38. *Id.* para. 26.

39. *Id.* para. 27. 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." *Id.*

40. *See id.* paras. 27–28. The FCC staff reaches a similar conclusion. *See id.* app. C at 4784–85.

41. *Id.* para. 24.

42. *See id.*

43. Jean-Jacques Laffont, Patrick Rey & Jean Tirole, *Network Competition: I. Overview and Nondiscriminatory Pricing*, 29 RAND J. ECON. 1, 19–20 (1998) [hereinafter Laffont, Rey & Tirole, *Network Competition*].

44. Jean-Jacques Laffont, Patrick Rey & Jean Tirole, *Competition Between Telecommunications Operators*, 41 EUR. ECON. REV. 701, 704–05 (1997).

even lower.[45] Clearly, the concept of terminating access monopoly cannot justify setting access charges that exceed the marginal cost of access. Therefore, this market failure fails to justify cross-subsidies.

Several types of pre-existing regulation may actually make the terminating access monopoly problem worse. Mandatory interconnection helps prevent an established incumbent from refusing to interconnect.[46] However, it also gives connecting competitors no choice but to pay the terminating access monopolist. In the absence of mandatory interconnection, a firm that charged excessive termination rates could find that other significant carriers simply decline to interconnect. Limited interconnection would place this firm at a competitive disadvantage when it vied for customers against competing firms that can 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, a decision to exacerbate the terminating access monopoly problem because it deprives competing networks of the option to "go it alone."

Laws and regulations that prevent itemized pass-through 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.[47] 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 do 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. For example,

45. *Id.* at 708.

46. *See id.* at 710. Mandatory interconnection is not sufficient to prevent market exclusion, as an incumbent forced to interconnect could simply set a very high access price in the absence of price regulation. *Id.*

47. *See* Further Notice, *supra* note 3, para. 83.

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.[48] 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.[49] In addition, long-distance and wireless companies have offered free or discounted calling between individuals who subscribe to the same network.[50] 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. Moreover, 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. Finally, both wireless and wireline phone subscribers have responded with long-distance plans that make a specified quantity of (or unlimited) long-distance service available at zero incremental cost per minute.[51]

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 remedy the terminating access monopoly more effectively than regulation. However, it does suggest that the FCC should remove regulatory barriers preventing private actions that could help deal with the problem.

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48. *See generally, e.g.*, MCI, Local and Long Distance Plans, http://consumer.mci.com/res_long_distance/index.html (last visited Dec. 19, 2005) (offering wireline long-distance plans with a set quantity of minutes included plus a rate for additional usage); Sprint, http://www.sprint.com (last visited Dec. 19, 2005) (offering a variety of wireless packages that include free night and weekend minutes and wireline long-distance plans with limited amounts of "anytime" minutes).

49. *See generally* Sprint, *supra* note 48.

50. *See, e.g.*, MCI, The Neighborhood http://consumer.mci.com/TheNeighborhood/res_local_service/jsps/default.jsp (last visited Dec. 19, 2005); Sprint PCS, Unlimited Sprint Mobile to Mobile Calling, http://www.sprintpcs.com/explore/ueContent.jsp?scTopic=unlimitedPcsToPcsCalling (last visited Dec. 19, 2005); Verizon Wireless, Calling Plans, http://www.verizonwireless.com/b2c/store/controller?item=planFirst&action=viewPlanOverview (last visited Dec. 19, 2005) (offering free "IN-Network" calling with almost all Verizon Wireless plans).

51. *See generally, e.g.*, MCI, *supra* note 48; Sprint, *supra* note 48.

Regulators, for example, could consider forbearance from requirements that long-distance companies average their rates across all customers and states when such forbearance is necessary to allow market-based solutions to the terminating access monopoly problem. If 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 pass-throughs should not be prohibited by the rate-averaging and rate-integration requirements.

III. ANALYSIS OF THE CURRENT INTERCARRIER COMPENSATION SYSTEM

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.[52]

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.[53] The average ranges from $0.006 per minute paid to large incumbent local exchange carriers for interstate calls, all the way to $0.051 per minute paid to small incumbent local exchange carriers for intrastate calls.[54] The averages can mask substantial variation.[55] Large incumbent local exchange carriers receive anywhere from $0.005 to $0.015 per minute for interstate calls, and small competitive local exchange carriers receive compensation ranging from $0.004 to $0.359 per minute for intrastate calls.[56]

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 also harm consumers by

52. *See generally* 1 ALFRED E. KAHN, THE ECONOMICS OF REGULATION 63–158 (1971) (discussing the need for marginal cost pricing, but not price discrimination, to achieve economically efficient prices for public utility services); 2 ALFRED E. KAHN, THE ECONONOMIS OF REGULATION 47–112 (1988) (discussing the incentives and distortions presented by regulation and the positive influences regulation has on public utility performance).

53. ICF Brief, *supra* note 6, app. C at 2.

54. *Id.*

55. *See id.*

56. *Id.*

taxing a price-sensitive service in order to subsidize a service, the use of which is not very sensitive to price.[57] As a result, the charges are likely to reduce use of long-distance service while generating little increase in subscriptions to local service.[58]

When an artificial price increase leads consumers to cut back on consumption by a large amount, it makes consumers substantially worse off.[59] The most recent extensive study that measures these welfare impacts was published by the Brookings Institution in 2000.[60] 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.[61] Long-distance companies gain an additional $1.9 billion to $3.4 billion annually, yielding a total increase in economic welfare of between $2.5 billion and $7 billion.[62] 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 $0.01 and $0.016 per domestic conversation minute and generated approximately $3.3 billion in revenues.[63] In 2002, there were 333.8 billion domestic conversation minutes, and average revenue per minute was $0.07. The incremental cost of access is measured in tenths of a cent, so most of the access charge subsidizes local telephone service.[64] A one-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.[65]

Similarly, intrastate access charges generate significant consumer costs. State policies vary, but one recent study using Texas data from

57. CRANDALL & WAVERMAN, *supra* note 5, at 166.

58. *Id.*

59. *See infra* notes 60–70 and accompanying text. 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 one 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, *supra* note 26, at 436; *see also* Jerry Hausman & Howard Shelanski, *Economic Welfare and Telecommunications Regulation: The E-Rate Policy for Universal-Service Subsidies*, 16 YALE J. ON REG. 19, 36–37 (1999).

60. CRANDALL & WAVERMAN, *supra* note 5.

61. *Id.* at 119.

62. *See id.* Using 1996 data, the authors 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. *See id.* at 113–14.

63. *See* JIM LANDE & KENNETH LYNCH, FCC, TELECOMMUNICATIONS INDUSTRY REVENUES 2003, at 31 tbl.10 (2005), *available at* http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/telrev02.pdf.

64. *See* Ellig, *supra* note 8, at 17.

65. *Id.*

2002 illustrates the potential consumer gains from intrastate access charge reform. Texas intrastate switched-access charges averaged $0.0768 per minute, and the largest incumbent received $0.0583 per minute.[66] Reducing the four largest incumbents' intrastate access charges to $0.01 per minute ($0.005 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.[67] The net consumer gain occurs because the access charge reduction lowers the costs of long-distance service, the demand for which is sensitive to price, while raising the cost of local service, the demand for which is not sensitive to price.[68]

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

> A comparison of the 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.[69]

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.[70]

Yet even this tradeoff may be an illusion. Higher long-distance rates tend to reduce telephone subscription because 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.[71] 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%, bringing 450,000 additional households onto the telephone network.[72]

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66. ROBERT W. CRANDALL & JERRY ELLIG, TEX. PUB. POLICY FOUND., TEXAS TELECOMMUNICATIONS: EVERYTHING'S DYNAMIC EXCEPT THE PRICING 38 (2005), *available at* http://www.texaspolicy.com/pdf/2005-01-telecom.pdf.

67. *Id.* at 42.

68. *See id.* at 21–24.

69. Hausman & Shelanski, *supra* note 59, at 39.

70. *See id.* at 38–39.

71. *See id.* at 37.

72. *See* Jerry Hausman et al., *The Effects of the Breakup of AT&T on Telephone Penetration in the United States*, 83 AM. ECON. REV. 178, 182–83 (1993); *see also* Garbacz & Thompson, *Estimating Telephone Demand: Update*, *supra* note 27, at 373–77. The authors also find that higher long-distance prices reduce telephone penetration rates, and the size of the effect falls between 1970 and 2000. *Id.*

Studies of phoneless households suggest that access charges 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.[73] A 1996 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, and calling-card calls—were the most common reasons that households lacked phone service.[74] 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.[75] The authors concluded, "Income, employment, and other measures of wealth or poverty are strongly related to low penetration not because the 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."[76]

A 1995 survey of Texas households without telephones found that about half said that the variable costs of local service make it difficult to afford a telephone.[77] However, close to eighty percent said they could afford to pay sixteen dollars per month, the actual average cost of local service in Texas at the time of the survey.[78] 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.[79] 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 $0.006 per minute for certain types of traffic and can be as high as $0.089 per minute.[80] Like long-distance service, demand for wireless minutes is relatively responsive to price, with U.S. demand elasticity most recently estimated in the range of

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This is a logical finding, given the large reductions in long-distance prices that occurred over that period.

73. Milton L. Mueller & Jorge Reina Schement, *Universal Service from the Bottom Up: A Study of Telephone Penetration in Camden, New Jersey*, 12 INFO. SOC'Y 273, 274 (1996).

74. *Id.* at 282.

75. *See id.* at 283.

76. *Id.* at 287.

77. JOHN B. HORRIGAN & LODIS RHODES, LYNDON B. JOHNSON SCH. OF PUB. AFFAIRS, THE EVOLUTION OF UNIVERSAL SERVICE IN TEXAS (1995), *available at* http://www.apt.org/policy/lbjbrief.html.

78. *Id.*

79. *Id.*

80. *See* ICF Brief, *supra* note 6, app. C at 2.

-1.12 to -1.29.[81] Some estimates using international data are even higher, in the range of -1.71 to -3.62.[82] These findings suggest that putting per-minute charges on wireless service to subsidize wireline service harms consumers in the same way that taxing long-distance service does, only more so.[83] Cost figures for long-distance access charges, therefore, should be taken as a 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.[84] As the FCC 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."[85]

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

81. *See* J. GREGORY SIDAK, CRITERION ECON. L.L.C., IS STATE TAXATION OF THE WIRELESS INDUSTRY COUNTERPRODUCTIVE? 19 (2003), *available at* http://www.criterioneconomics.com/docs/sidak_pacific_research.pdf (using 1999–2001 data); *see also* Jerry Hausman, *Cellular Telephone, New Products, and the CPI*, 17 J. BUS. & ECON. STAT. 188, 191 (1999) [hereinafter Hausman, *Cellular Telephone*] (estimating a demand elasticity of approximately -0.5 with 1988–1993 data); Mark Rodini et al., *Going Mobile: Substitutability Between Fixed and Mobile Access* 17 (Haas Sch. of Bus. Ctr. for Research on Telecomm. Policy, Working Paper CRTP-58, 2002), *available at* http://ssrn.com/abstract=379661 (estimating an overall price elasticity of demand of -0.6 with 2000–2001 data).

82. *See* THOMAS W. HAZLETT & ROBERTO E. MUÑOZ, AEI-BROOKINGS JOINT CTR. FOR REGULATORY STUDIES, RELATED PUB'N 04-18, A WELFARE ANALYSIS OF SPECTRUM ALLOCATION POLICIES 15 (2004), *available at* http://www.aei-brookings.org/admin/authorpdfs/page.php?id=1024; Gary Madden & Grant Coble-Neal, *Economic Determinants of Global Mobile Telephony Growth*, 16 INFO. ECON. & POL'Y 519, 531 (2004); *see also* Garbacz & Thompson, *Universal Telecommunication Services*, *supra* note 28, at 507 (using 1996–2001 data for developed countries, the authors found a price elasticity of -0.45 with respect to the monthly charge); *cf.* Hyungtaik Ahn & Myeong-Ho Lee, *An Econometric Analysis of the Demand for Access to Mobile Telephone Networks*, 11 INFO. ECON. & POL'Y 297, 299 (1999) (finding that connection prices, monthly subscription charges, and the cost of a three-minute call rarely had statistically significant effects on the national wireless subscription rate).

83. Garbacz & Thompson, *Universal Telecommunication Services*, *supra* note 28, at 508–09.

84. *See* Further Notice, *supra* note 3, paras. 23, 67–68; *see also id.* app. C at 4786 n.41.

85. *Id.* para. 23.

costs were recovered through a fixed charge instead of a usage-based charge.[86]

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 and other activities intended to influence regulators' and legislators' decisions.[87] From a society-wide perspective, money spent purely to capture wealth transfers is often considered waste.[88] In some circumstances, the total amount of money wasted may even exceed the size of the wealth transfer.[89] It is unclear how much of the billions of dollars' worth of intercarrier compensation is expended to influence governmental processes rather than to reduce prices for the consumers who are supposed to benefit from the subsidies. Research on other telecommunications regulations, however, suggests that the waste could be substantial.[90]

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 revenue from interstate access charges and 16 percent from intrastate access charges."[91] Rate-of-return regulation often distorts the regulated firm's choice of inputs, so the regulated firm fails to produce at minimum cost.[92] Rate-of-return regulation also reduces entrepreneurial incentives to squeeze out unnecessary costs and undertake valuable but risky innovation.[93] Although the resulting rates could be deemed "just and reasonable," the

86. Ellig, *supra* note 8, at 16–17.

87. *See* Gordon Tullock, *The Welfare Costs of Tariffs, Monopolies, and Theft*, *in* TOWARD A THEORY OF THE RENT SEEKING SOCIETY 39, 46–50 (James M. Buchanan et al. eds., 1980).

88. *See id.*

89. *See id.*

90. *See, e.g.*, Ellig, *supra* note 8, at 47 (finding that unbundled network element platform regulation transferred approximately $3.1 billion from incumbent phone companies to competitive local exchange carriers in 2003 while competitors' customers received only a fraction of the wealth transfer).

91. *See* Further Notice, *supra* note 3, para. 107.

92. *See, e.g.*, Léon Courville, *Regulation and Efficiency in the Electric Utility Industry*, 5 BELL J. ECON. 53, 72 (1974) (concluding that rate of return induces overcapitalization in the electric utility industry); Robert M. Spann, *Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis*, 5 BELL J. ECON. 38, 50 (1974) (concluding that the Averch-Johnson hypothesis, which argues that rate-of-return regulation leads to overcapitalization of the regulated firm, is accurate).

93. *See* ISRAEL KIRZNER, DISCOVERY AND THE CAPITALIST PROCESS 119, 141–45 (1985).

actual costs would be inflated.[94] 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.[95]

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 consumer benefits or minimizes consumer harms, therefore, should do three things. First, such a system should avoid taxing price-sensitive services to subsidize services that are not sensitive to price. Second, such a system should recover fixed costs through charges that do not vary with usage. Finally, such a system should 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.[96] The Intercarrier Compensation Forum and Western Wireless submitted bill-and-keep proposals that include some per-minute access charges during a transition period.[97] Various other proposals would retain the "calling party's network pays" approach but in the context of a unified and simplified system.[98] 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.[99] Home Telephone Company and PBT Telecom propose connection charges in place of per-minute charges.[100] The Expanded Portland Group proposes per-minute

94. Ellig, *supra* note 8, at 3.

95. *See* ECON. & TECH., INC., LOST IN TRANSLATION: HOW RATE OF RETURN REGULATION TRANSFORMED THE UNIVERSAL SERVICE FUND FOR CONSUMERS INTO CORPORATE WELFARE FOR THE RLECS 37–40 (2004), http://www.econtech.com/Lost%20in%20Translation_ETI.pdf. The report concluded that rural incumbent local exchange carriers' corporate operations expenses were $545 million (33%) higher than they would be if all of these companies were as efficient as the top-performing 25% of companies in each size-based group. *Id.* at 40.

96. Further Notice, *supra* note 3, app. C at 4781.

97. *See id.* paras. 40–44, 54–55. The Cellular Telecommunications and Internet Association (CTIA) also submitted a list of principles that includes support for bill-and-keep. *See id.* para. 59.

98. *Id.* app. C at 4781–82.

99. *Id.* paras. 48–51, 56. Principles submitted by the National Association of Regulatory Utility Commissioners also appear to permit per-minute charges. *See id.* paras. 57–58.

100. *Id.* paras. 52–53.

charges during a transition period but eventually substitutes capacity-based charges.[101]

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 for which 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.[102]

In theory, a reformed calling-party's-network-pays approach could 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.[103] 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.[104] When a carrier installs equipment needed to interconnect with other carriers, the interconnection volumes of which 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 rate-making

101. *Id.* paras. 45–47.
102. *Id.* paras. 42, 54.
103. *Id.* paras. 45–47.
104. *See* JONATHAN E. NUECHTERLEIN & PHILIP J. WEISER, DIGITAL CROSSROAD: AMERICAN TELECOMMUNICATIONS POLICY IN THE INTERNET AGE 321 (2005); Patrick DeGraba, *Bill and Keep at the Central Office as the Efficient Interconnection Regime* 26–27 (FCC, OPP Working Paper No. 33, 2000), *available at* http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp33.pdf.

process ripe for perpetuation of hidden subsidies.[105] 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.[106]

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 transit services from another carrier.[107] 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 competition exists, and the scope of such regulation would likely decrease as competition increases.[108]

Of course, it is possible that in some cases the bill-and-keep rule, along with the designated interconnection points, may not be optimal for governing interconnection between 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. Existing network configurations, for example, might create opportunities for interconnection where two networks overlap at a point different from the FCC-specified interconnection point. A smaller, capital-constrained carrier might find it advantageous to build partway to the larger carrier's interconnection point, utilize transport for the rest, and pay a per-minute rate for transport. As FCC staff have suggested, bill-and-keep, and the designated interconnection points, should be mandatory as defaults but not compulsory if carriers can agree to an alternative.[109] If carriers find it in their interests to negotiate other arrangements, the FCC should not prevent them from doing so.

Because a primary purpose of regulating interconnection is to deal with the terminating access monopoly problem, it is worth considering

105. *See, e.g.*, Michael A. Crew & Charles K. Rowley, *Toward a Public Choice Theory of Monopoly Regulation*, 57 PUB. CHOICE 49, 59–63 (1988).

106. *See* Further Notice, *supra* note 3, para. 91.

107. *See id.* paras. 120–133.

108. *See* Further Notice, *supra* note 3, app. C at 4789–92 (making a similar point in consideration of replacing intercarrier payments with end-user charges); NUECHTERLEIN & WEISER, *supra* note 104, at 324; DeGraba, *supra* note 104, at 34.

109. DeGraba, *supra* note 104, at 8 (proposing an interconnection pricing system called "Central Office Bill and Keep" or "COBAK").

whether this "opt-out" proposal would allow the problem to reappear. For consumers, the two dangers posed by terminating access monopoly are exclusion and collusion.[110] Allowing carriers to contract out of bill-and-keep risks neither danger.

Exclusion occurs when a (presumably large) competitor refuses to interconnect with a rival or sets a prohibitively high interconnection rate.[111] As long as bill-and-keep remains a mandatory default, any rival that fears exclusion need only invoke its right to interconnect under bill-and-keep.

Some economic models reveal that tacit collusion on retail prices is possible when networks agree on high reciprocal access charges.[112] Such collusion, however, occurs in models that assume firms charge retail prices per use (such as per call or per minute). When firms can charge a two-part tariff, consisting of a fixed subscription fee plus a charge that varies with use, the danger of collusion largely disappears.[113] Most telecommunications firms today charge a fixed monthly subscription fee; indeed, various "unlimited service" plans have nothing but a fixed fee, with no usage-based charges at all.[114]

It is also worth noting that the economic models of access-charge collusion analyze the interactions of only two firms in order to make the mathematics tractable. Before the firms can tacitly collude on retail prices, they must agree on access charges. The models typically introduce this agreement by assuming either that the firms colluded to set access charges or that regulators, for some unspecified reason, decided to set access charges above marginal cost.[115] To generalize the results to a world with multiple competitors who interconnect, one would have to assume that most major telecommunications firms collectively negotiated identical access prices and interconnection terms in order to opt out of bill-and-keep. Given the diversity of views on interconnection policy evident in the FCC's proceeding, such collusion is highly unlikely to occur.[116] Even if such collusion did occur, it would be highly apparent to regulators. Permitting telecommunications companies to negotiate alternatives to bill-and-keep does not mean that they have a free hand to engage in overt collusion on access charges.

The FCC does not need to determine conditions under which firms could adopt arrangements other than bill-and-keep. The only requirement for opting out of bill-and-keep would be that the carriers involved actually agree on some alternative arrangement. Allowing

110. *See* Atkinson & Barnekov, *supra* note 23, at 7; Laffont, Rey & Tirole, *Network Competition*, *supra* note 43, at 2.

111. *See* Atkinson & Barnekov, *supra* note 23, at 7.

112. Laffont, Rey & Tirole, *Network Competition*, *supra* note 43, at 8–12.

113. *Id.* at 20–22.

114. *See, e.g.*, Sprint, *supra* note 48.

115. *See* Laffont, Rey & Tirole, *Network Competition*, *supra* note 43, at 8.

116. *See* Further Notice, *supra* note 3, paras. 38–59.

companies to contract out of bill-and-keep could create some additional room for disagreement and dispute, as carriers explore alternative connection points and transport agreements. Such disagreements should not be permitted to create substantial additional workload for the FCC. Carriers that contract out of bill-and-keep could choose an independent arbitrator or court, rather than the FCC, to resolve disagreements that might arise. In the absence of some alternative agreement, the FCC's bill-and-keep rules would govern the interchange of traffic.

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 likely would 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.[117]

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."[118] In analyzing the likely effects of mergers, antitrust enforcers often use the observed premerger price as a proxy for the competitive price.[119] 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.[120] To assess whether an incumbent phone company has market power, therefore, one must determine whether the firm has the ability to raise

117. *See id.* paras. 101, 103.

118. U.S. DEP'T OF JUSTICE & FTC, HORIZONTAL MERGER GUIDELINES 2 (1997), *available at* http://www.usdoj.gov/atr/public/guidelines/hmg.pdf (originally issued Apr. 2, 1992).

119. *See generally id.*

120. *See* CRANDALL & WAVERMAN, *supra* note 5, at 112. Crandall and Waverman reach this conclusion using a variety of cost models that have been proffered in FCC proceedings. *Id.* Crandall and Ellig, using the FCC's Hybrid Cost Proxy Model, find that residential rates charged by the four largest incumbent phone companies in Texas fall $600 million short of covering the long-run incremental cost of residential lines. CRANDALL & ELLIG, *supra* note 66, at 25. On average, rates fail to cover costs for about 95% of lines. *Id.*

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. When incumbent phone companies are free to charge prices that cover costs, competition may well constrain their ability to raise prices above cost.

The most direct evidence compares the unsubsidized cost of local wireline service to the cost of alternatives. Prior to passage of the Telecommunications Act of 1996,[121] 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.[122]

More recently, the move toward bundling local telephone service with other services for which prices are not regulated has allowed local phone companies to sidestep rate regulation for customers who buy the bundle. Long-distance prices are not regulated, and in many states at least some vertical calling features, such as call waiting, are also not regulated.[123] Several pieces of evidence suggest that competition constrains what local phone companies can charge for bundles of local service, long-distance service, and vertical features.

First, recent econometric research finds that wireless is finally becoming a substitute for wireline service in the United States. Wireless companies pioneered the bundling of local calling and vertical features, often with long-distance included at no extra charge. Using 2000–2001 data for 294 urban areas in the United States, Rodini et al. found that a one percent increase in the price of wireline service led to a 0.18% increase in wireless subscriptions in 2000 and a 0.13% increase in 2001.[124] With the same data set, Ward and Woroch found that the price of wireless service had a statistically significant effect on the market share of wireline local, intrastate long-distance, and interstate long-distance.[125] Using similar data for 1999–2001, Sidak found that wireless is a substitute for wireline long-distance; a 10% increase in the price of wireline long-distance leads to a 0.2% increase in wireless minutes.[126] At a minimum,

121. Pub. L. No. 104-104, 110 Stat. 56 (1996).

122. *See* ROBERT W. CRANDALL & LEONARD WAVERMAN, TALK IS CHEAP: THE PROMISE OF REGULATORY REFORM IN NORTH AMERICAN TELECOMMUNICATIONS 227 (1995).

123. *See* RICHARD O. LEVINE ET AL., TRENDS IN THE COMPETITIVENESS OF TELECOMMUNICATIONS MARKETS: IMPLICATIONS FOR DEREGULATION OF RETAIL LOCAL SERVICES 13, 16, 40 (2003), *available at* http://www.pff.org/issues-pubs/books/031211specialreportcontestability.pdf.

124. Rodini et al., *supra* note 81, at 16–17.

125. Michael R. Ward & Glenn A. Woroch, *Usage Substitution Between Mobile Telephone and Fixed Line in the U.S.* 17 tbls.2, 3 & 4 (May 2004) (unpublished manuscript, on file with author).

126. *See* SIDAK, *supra* note 81, at 19–20.

the price of wireless thus constrains the price that wireline phone companies can charge for a package that includes long-distance service.

Second, surveys reveal that bundles of local, long-distance, and vertical features are available from competitors at prices comparable to those charged by incumbent wireline carriers. A 2003 survey found that in the Washington, D.C., area, multiple carriers offered packages that included residential local, local toll, long-distance, and multiple vertical services for about fifty dollars per month.[127] Carriers included an incumbent (Verizon), a broadband service provider (RCN/Starpower), several wireless providers, and a competitive local exchange carrier using the unbundled network element platform (MCI).[128] Similar findings emerged in case studies of Idaho, Utah, Texas, Ohio, and Massachusetts.[129] 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.[130] As one might expect, competition is much more feasible when the incumbent is not forced to sell below cost.

Third, the ubiquitous presence of VoIP service effectively caps the price that wireline incumbents can charge for stand-alone voice service for any customer who already has a broadband connection. One of the best-known providers offers unlimited local and long-distance calling within the United States, Canada, and Puerto Rico for $24.99 per month, or 500 any-distance minutes for $14.99.[131]

Deregulating the subscriber line charge would allow incumbent local exchange carriers to charge prices that at least cover costs, unless the presence of more efficient competitors prevents them from recovering their full costs. In most cases, competition would likely be strong enough to prevent incumbents from charging prices that substantially exceed costs. Any test for deregulating individual carriers' subscriber line charges should assess whether the incumbent can raise prices significantly above the unsubsidized levels that would exist in competitive markets—not the artificially low, regulated prices that many residential consumers pay for basic phone service today.

C. Universal Service Issues

A transition to either bill-and-keep or truly cost-based per-minute charges would almost certainly reduce payments to many local phone companies. Many of the reform proposals suggest using universal service

127. *See* LEVINE ET AL., *supra* note 123, at 59.
128. *Id.*
129. *Id.* at 91–131.
130. *Id.*
131. *See* Vonage, http://www.vonage.com (last visited Dec. 18, 2005).

funding to replace revenues that some phone companies could lose as a result of intercarrier compensation reform.[132]

Replacing lost subsidies with universal service support would increase transparency, one of the goals of the Telecommunications Act of 1996. 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.[133]

Beyond the transparency benefit, replacing intercarrier compensation with universal service support may do little to promote consumer welfare. There are two principal reasons for this deficiency. 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.

1. Current Universal Service Funding Distorts Prices

Federal universal service funds come from contributions levied as a percentage of carriers' interstate and international revenues.[134] 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.[135] This funding mechanism for universal service programs generates substantial consumer costs in addition to the revenue it raises to fund universal service.[136] This occurs because the contribution

132. *See* Further Notice, *supra* note 3, paras. 101–111.
133. *Id.* paras. 9–11.
134. Ellig, *supra* note 8, at 20.
135. *Id.*
136. *Id.*

mechanism acts as a tax on services with relatively high price elasticities of demand, such as long-distance and wireless.[137]

A recent 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 $0.008 per conversation minute.[138] This price increase raised approximately $2.7 billion in revenues, but it also reduced consumption of long-distance service.[139] 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.[140]

Universal service assessments on interstate wireless service raised approximately $1.4 billion in 2003.[141] Combining available 2003 data on wireless subscriptions, 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.[142]

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 which exhibit demand price sensitivity. 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, the demand for which is even more responsive to price than that for 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 regulators decide to replace some or all lost access charge revenues with universal service payments, they could mitigate the

137. *Id.*

138. *Id.* at 21.

139. *Id.*

140. *Id.* at 20–21; *see also* LANDE & LYNCH, *supra* note 63, at 30 tbl.10.

141. *See* INDUS. ANALYSIS & TECH. DIV., FCC, TRENDS IN TELEPHONE SERVICE 19-5 to 19-19 (2004), *available at* http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend504.pdf [hereinafter TRENDS IN TELEPHONE SERVICE] (calculating figures by multiplying total universal service outlays, table 19.1, by the percentage of contributions from wireless, shown in table 19.15).

142. *See* Ellig, *supra* note 8, at 21–22. The total reduction in economic welfare for 2004 has been estimated at $978 million. Jerry Ellig, *Costs and Consequences of Federal Telecommunications Regulation*, 58 FED. COMM. L.J. 37, 60 (2006).

economic welfare losses by funding these payments with contributions from services with less price-sensitive demand. The most commonly discussed alternatives are usually assessments for each phone number or network connection. 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.[143] 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 rather that they may be less distorting than the current funding mechanisms. Research on wireline telephone demand consistently finds that subscription is not very sensitive to the monthly price.[144] In fact, the most recent studies of the United States suggest that the elasticity of demand for wireline access is virtually zero, though that may be changing as wireless has become a more viable substitute for wireline service.[145] Elasticities of demand for second wireline phone lines in the United States range between -0.35 and -0.59—higher than for the first line but still relatively low.[146] Similarly, most economic studies that investigate the demand for wireless by using the number of subscribers per hundred or the probability of subscription as the dependant variable yield elasticities of between -0.43 and -0.71.[147] That is, a one percent increase in the monthly subscription price reduces the number of subscribers by between four-tenths and seven-tenths of one percent.[148]

Elasticities are much higher, however, when the dependent variable is minutes of use and the independent variable is per-minute charges. Studies that estimate demand by employing minutes of use as the dependent variable yield much higher elasticities, between -1.12 and -1.29 using domestic U.S. data and between -1.71 and -3.62 using

143. *See* Jerry Hausman, *Taxation by Telecommunications Regulation*, *in* 12 TAX POLICY AND THE ECONOMY 29, 46 (James M. Poterba ed., 1998).

144. CRANDALL & WAVERMAN, *supra* note 5, at 90.

145. *Id.* at 91 tbl.5-1; Garbacz & Thompson, *Universal Telecommunication Services*, *supra* note 28, at 497, 506.

146. Kevin T. Duffy-Deno, *Demand for Additional Telephone Lines: An Empirical Note*, 13 INFO. ECON. & POL'Y 283, 295 (2001); James Eisner & Tracy Waldon, *The Demand for Bandwidth: Second Telephone Lines and On-line Services*, 13 INFO. ECON. & POL'Y 301, 308 (2001).

147. *See* Garbacz & Thompson, *Universal Telecommunication Services*, *supra* note 28, at 506; Hausman, *Cellular Telephone*, *supra* note 81, at 191; Jerry Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, 53 NAT'L TAX J. 733, 738 (2000) (estimating a demand elasticity of -0.71); Rodini et al., *supra* note 81, at 17.

148. *See id.*

international data.[149] Therefore, a shift to numbers- or connections-based universal service contributions likely would reduce the size of the distortion, since the demand for connections appears to be less elastic than the demand for minutes of use. The possibility that even numbers-based or connections-based funding options could distort behavior, however, is another strong argument for ensuring that the subsidies they fund are as small as possible.

2. Universal Service Payments to Carriers Can Promote Waste and Inefficiency

The U.S. federal government spent approximately $5.7 billion on universal service programs in 2003.[150] More than half of this money—approximately $3.3 billion—went to subsidize high-cost carriers, and $713 million (12.5%) was spent on programs for low-income customers that help pay initial connection charges (Linkup) and subsidize monthly phone bills (Lifeline).[151] Most of the rest (approximately $1.7 billion, or 30%) subsidized internal wiring, telecommunications, and Internet service to schools and libraries.[152] Thus, about 70% of the funds were devoted to subsidizing basic telephone service, with the remainder spent on the newer "universal service" programs created by the Telecommunications Act of 1996, which reduce the cost of Internet service to specified types of institutions.[153]

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 larger local exchange carriers.[154] 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 more than sixty percent of their revenues from federal and state universal service fund payments, and several count on these sources for three-quarters of their revenues.[155]

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149. *See* HAZLETT & MUÑOZ, *supra* note 82, at 15; SIDAK, *supra* note 81 at 9–10.
150. *See* TRENDS IN TELEPHONE SERVICE, *supra* note 141, 19-5 tbl.19.1.
151. *Id.*
152. *Id.*
153. *See id.*; *see also* Telecommunications Act of 1996, Pub. L. No. 104-104, § 110 Stat. 56 (1996).
154. ICF Brief, *supra* note 6, app. C.
155. *See* ECON. & TECH., INC., *supra* note 95, at 7.

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 best means to accomplish this would be to phase out the subsidies according to a certain, predictable schedule. Political concerns, however, likely will make such a move impractical. The next best approach, which likely would face fewer political obstacles, would be to gradually reduce the subsidies by a fixed percentage per year to reflect expected increases in productivity that should lessen the need for subsidies. This would work similar to price cap regulation, which allows prices to increase in step with some retail price index, but instead adjusts prices downward over time to reflect expected productivity increases. Instead of capping prices, the FCC would reduce subsidies by a fixed percentage per year. If high-cost phone companies can find ways to reduce their costs at a more rapid rate than that fixed percentage, then they could keep the difference. Similarly, if they find ways of offering new, better, or otherwise more valuable services that consumers are willing to pay for, they can keep those new revenues. In this way, the subsidy reduction would create strong incentives for recipient companies to find ways of reducing costs or increasing the value they deliver to customers.

V. CONCLUSION

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, a reform plan that best advances consumer welfare would do the following:

- Eliminate subsidies embedded in current access charges and other intercarrier payments;
- Adopt bill-and-keep as the most straightforward and effective way of accomplishing this goal;
- Utilize bill-and-keep, and any associated regulations defining interconnection points, as default rules but permit carriers to contract for alternative arrangements if they are mutually beneficial;

- If any terminating access charges are retained (contrary to bill-and-keep), encourage private solutions to the terminating access monopoly problem by permitting interexchange carriers to pass terminating access charges back to the calling party;
- Continue to treat Internet protocol-based services that do not interconnect with the public switched telephone network as information services and refrain from requiring them to interconnect with the telephone network or participate in the cross-subsidy system that pervades the telephone network;
- Promote competition in local telephone service by deregulating subscriber line charges, so that rates can rise to reflect costs;
- 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; and
- If lost revenues are to be replaced by universal service subsidies, fund the subsidies in ways that distort prices the least and either phase them out by a certain date or gradually reduce them to reflect expected productivity increases.

In a turn-of-the-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."[156] The recommendations in this Article 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.

156. Atkinson & Barnekov, *supra* note 23, at 9.