

# Seven Years After Kahn and Shew: Lingering Myths on Costs and Pricing Telephone Service

Steve G. Parsons†

*The costs of linking customers with the public switched telephone network have been ill-defined as costs common to all telecommunications services, argued Alfred E. Kahn and William B. Shew here in 1987. Now as the pace of change in telecommunications accelerates, Steve Parsons argues that the proper assignment of these so-called loop costs is increasingly important, since it affects many areas of public network law and policy, including rate-setting, cross-subsidy tests, and franchise obligations. Parsons argues in favor of Kahn and Shew's position and poses eight additional arguments for attributing loop costs directly to the provision of access to the network. He traces the misclassification of loop costs to careless nomenclature, misapplied microeconomics, and the merging of inconsistent concepts and arguments. He suggests how and why telecommunications policy, as it evolves, must embrace loop costs as attributable to their own service rather than allocated to other network-using services.*

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†Economist at Southwestern Bell Telephone, St. Louis, Missouri. Ph.D. Economics, University of California at Santa Barbara, 1982. This Article represents the opinions of the author and does not necessarily reflect the opinions, policies or business plans of Southwestern Bell Corporation or any of its subsidiaries. Thanks are due to Leo Bub, Alex Larson, and Margret Starkey for comments on earlier drafts and thanks in particular to Dan Haug and Shorey Russell for research assistance.

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## Introduction

In a 1987 article in this journal, Alfred Kahn and William Shew<sup>1</sup> argued that the costs of providing customers with access to the telephone network are not common or shared costs to be borne by all telecommunications services.<sup>2</sup> These costs, said Kahn and Shew, arise when carriers provide access to the public switched telecommunications network and can be attributed directly to their own unique service. Classifying such directly attributable costs as common costs misrepresents the economic cost of basic telephone service and has broad implications for telecommunications law and policy.

In the seven years since Kahn and Shew's article, the proper treatment of the costs of subscriber access has become more important. The increasingly competitive telecommunications industry has struggled to accommodate new technologies under changing regulatory regimes.<sup>3</sup> New participants continue to enter the market, and the relationships among all entities are dynamic as well.<sup>4</sup> As previous markets and industries converge to form a hybrid of

1. Alfred E. Kahn & William B. Shew, *Current Issues in Telecommunications Regulation: Pricing*, 4 YALE J. ON REG. 191 (1987).

2. In the same time period as Kahn and Shew, John Wenders presented similar (although less exhaustive) arguments in this area. See JOHN T. WENDERS, *THE ECONOMICS OF TELECOMMUNICATIONS: THEORY AND POLICY* 177-83 (1987).

3. For example, facilities-based intraLATA competition is allowed in a greater number of states; Open Network Architecture has been treated more fully at the federal level; the issue of unbundling of services has arisen in many state jurisdictions; and issues of switched and special collocation, and transport rate restructuring have been considered. See, e.g., Alexander C. Larson, *Overview*, 15 PULA xvii (July-Dec. 1992) (citing competition for LEC loops from line side interconnection and wireless technologies, recent regulatory mandates to unbundle network facilities, and the FCC's collocation policies); Alexander C. Larson, *An Economic Guide to Competitive Standards in Telecommunications Regulation*, in 1 COMMLAW CONSPPECTUS 31, 32 n.5 (1993) (citing the emergence of alternative regulatory plans in the state regulation of telecommunications); *MCI Rolls Out Plans for Local Network in Major Challenge to RHCs*, COMM. DAILY, Jan. 5, 1994 at 1. ("MCI said Tues. it will spend at least \$2 billion to build local telephone networks throughout U.S. Local access network is part of larger \$20-billion 'umbrella' strategy . . . called 'networkMCI.'")

4. These changes occur through mergers, joint ventures, and other contractual arrangements. See generally Andrew C. Barrett, *Shifting Foundations: The Regulation of Telecommunications in an Era of Change*, 46 FED. COMM. L.J. 39 (1993).

communication/information products and services, firms, regulators, and courts must begin to resolve new policy issues. And although basic local telephone service maintains high market penetration, universal telephone service is perhaps more important today because the traditional support mechanisms for universal service are being reevaluated.<sup>5</sup> Today, the treatment of subscriber access costs affects many aspects of the industry: rate-setting decisions for many telecommunications services, cross-subsidy tests, policies on unbundling telecommunications networks, the franchise obligation to provide local service, and methods of cost calculation.<sup>6</sup>

This Article reviews and supports the Kahn and Shew rationale. It also offers eight additional arguments that noneconomists may find persuasive and questions why, despite Kahn and Shew's detailed arguments, their position has rarely been understood or accepted by regulators.

The distinction between directly attributable<sup>7</sup> and common costs is important: direct costs are those caused by providing a particular service; common costs, on the other hand, are incurred by the firm simply by being in business and cannot be attributed unambiguously to an individual product or service. For example, for a firm producing two products, the expense of a business license is not a direct cost; it cannot be attributed solely to either of the products. Such unattributable costs are known as joint,<sup>8</sup> shared, nonunique, or common costs. This Article uses the term common cost to include each of these.

Subscriber access provides end users with a pathway to the public switched telephone network.<sup>9</sup> In some instances, the subscriber pays a monthly fee for access and additional fees for use of the network such as local and long-distance calling. Often, local use service and subscriber access service are bundled together, and the customer pays a single monthly fee for both services. For a local telephone company, providing subscribers with access to the

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5. In part, this reevaluation is occurring because of many factors: collocation decisions at local telephone companies' switches, possible restructuring of interexchange carrier access rates, the allowance of facilities-based interLATA competition for some services such as toll, and the threat from alternate access providers and telecommunications bypass generally.

6. This topic has particular relevance for fully distributed cost calculations. Fully distributed costs are treated in Part IV. See *infra* note 71 and accompanying text.

7. Costs that are directly attributable to individual products are known by a variety of labels including variable, marginal, unique, or direct costs. Fixed costs (those costs that do not vary with the volume of output) may be directly attributable to an individual service (a service-specific fixed cost) or common.

8. Often in economics, the term "joint cost" is used to refer to the unattributable costs of producing joint products or producing products in fixed proportions. Marshall and Taussig provide an early treatment of this topic. See ALFRED MARSHALL, *PRINCIPLES OF ECONOMICS* 388-93 (8th ed. 1920); F. W. TAUSSIG, *PRINCIPLES OF ECONOMICS* 214-20 (3d ed. 1925). If a fixed amount of wool and a fixed amount of mutton are produced from each sheep, the expenditure on the sheep itself would be a joint cost to the production of wool and mutton. The existence of a joint cost does not preclude other directly attributable costs, such as butchering costs or shearing costs.

9. Generally the term "access" without the modifying term subscriber refers to access to the local telephone company's network by long distance companies. Such interexchange carrier (long-distance company) access is treated only briefly in this Article.

network accounts for a large portion of its costs. The costs of providing subscriber access include the physical facilities between the customer and the local telephone company's central office or local switch. These facilities include: the loop, a pair of twisted copper wires;<sup>10</sup> a portion of the capacity of the infrastructure necessary for the loop such as conduit, trench, and phone pole space;<sup>11</sup> and the electronics and space at the central office necessary to connect the loop to the local telephone company's switch. The phrase "loop cost" is used here to refer to the full costs of subscriber access.

Some argue that common costs can be allocated to individual services. If a cost is truly common, it is unaffected by individual services, and any allocation of such costs to individual services is economically nonsensical.<sup>12</sup> Kahn and Shew do not argue that loop costs should in some fashion be allocated to the service of subscriber access; rather, they describe why loop costs are directly attributable to, that is, are directly caused by, subscriber access service. They argue that loop costs are not common costs.

### I. Kahn and Shew's Arguments on Loop Costs<sup>13</sup>

Some analysts argue that loop costs are not directly attributable to subscriber access service, but rather are costs common to all of the services that use the loop.<sup>14</sup> Kahn and Shew present six pricing fallacies<sup>15</sup> that have contributed to the misclassification of loop costs. Six statements corresponding

10. The loop could utilize a fiber optics glass pair. Alternatively, the function of the loop could be provided by wireless facilities as would occur in a Personal Communications Services (PCS) or Basic Exchange Telephone Radio Services (BETRS) environment.

11. Simply having a shared facility (such as a switch or a conduit) does not imply that all of the costs of the facility are shared or common to the services using the facility. For example, an airplane is shared by first-class and coach-class passengers. However, if an airplane is filled to capacity, each passenger contributes to the exhaustion of the facility's capacity. In telecommunications, capacity costing is used to reflect the directly attributable economic cost of using a shared facility. See generally Viktor Schmid-Bielenberg, Bellcore's Switching Cost Information System (SCIS) Cost Model: A Practical Approach to a Complex Problem (June 20, 1990) (unpublished manuscript, on file with the author).

12. See *infra* note 70 and accompanying text. Because common costs are unaffected by any decision regarding an individual service, allocating such costs to services is economically incorrect. Allocation of common costs is fundamentally different from the proper attribution of costs. Economically proper cost analysis attempts to attribute all of the costs actually caused by a particular service to that service. This method stands in contrast to a fully distributed cost (FDC) calculation, which allocates common costs to services, but in so doing also allocates to services costs not caused by those services. Thus, FDC methods overstate the real economic costs of providing individual services.

13. Part I of this Article deals explicitly with Part II of Kahn & Shew, *supra* note 1, at 200. Part III of Kahn & Shew, *supra* note 1, at 210, "Some Empirical Issues," is treated in the present Article as the sixth item *infra* Part III, section C.

14. See, e.g., David Gabel & Mark Kennet, *Pricing of Telecommunications Services*, 8 REV. INDUS. ORG. 1 (1993); David Gabel & Mark Kennet, *Pricing of Telecommunications Services: A Reply to Comments*, 8 REV. INDUS. ORG. 43 (1993); cf. Margaret M. Dalton & Patrick C. Mann, *Telephone Cost Allocation: Testing the Variability of Costs*, 64 LAND ECON. 296 (1988). Similar claims made in regulatory proceedings are examined in Part II of this Article.

15. Kahn & Shew, *supra* note 1, at 200-10; see also WENDEKS, *supra* note 2 (addressing items one and three of the six treated by Kahn & Shew).

to the correction of the six fallacies discussed by Kahn and Shew are presented and briefly described below; some of these arguments are refocused, presented with different examples, and expanded beyond the original exposition by Kahn and Shew.

First, subscriber access is a service in its own right. While customers without access can place outbound calls from a coin phone or a neighbor's house, most people value private and convenient access to the phone network and the capacity to make and receive calls readily. More importantly, providing subscriber access has costs that can be identified separately and attributed directly to the service. Local telephone companies undeniably incur costs when providing end users with access to the network. These costs are independent of customers' use of the network, since they occur whether or not customers actually use the network. A customer who demands subscriber access with no intention of ever placing a call—for example, if the customer demands the access service only to receive calls in emergencies—causes the same loop costs as other customers that use the network frequently.

Second, in competitive markets throughout the economy, providers often charge for access alone. Country club and health club memberships, restaurant minimum fees, cover charges at bars, credit card annual fees, access fees for on-line computer services, and monthly fees for bank checking accounts illustrate this practice of charging fees solely for ingress. In real estate contracts, access across adjacent property for a second entrance generally has a positive price. Access-type services are often so specific to the asset that the access facilities are purchased outright by the customer. For instance, in paving a residential driveway the property owner generally buys the facilities providing access—a route between a garage and the network of public roads. When the cost of access to the provider is relatively low, the customer usually pays nothing for access, as in parking at a suburban shopping center. Relatively high access costs, for example, those associated with digging a well or providing parking downtown, are likely to produce positive prices to customers for access.

Access bears conceptual similarities to an option clause in a contract. Stock options, the right to purchase or sell stock at a given price, are bought and sold in well-developed markets. Subscriber access to the telecommunications network with local measured service is analogous to stock options in that access provides only the opportunity to use the network. Actual use of the network has a separate fee. In contracts for commercial office space, options to expand beyond current leased space are common. Such options represent access to additional space; the option itself generally has a price separate from the price for the actual use of the additional space. Thus, charging for access alone is a well-established commercial practice.

Third, local subscriber access and usage (telephone calls) are not joint products. Joint products occur in fixed proportions—one yolk and one white

from one egg. The cost of the egg may therefore be a common cost of producing yolks and whites. However, telecommunications services generally are not produced in fixed proportions. With each access line the customer does not receive a fixed number of minutes of usage, such as thirty minutes of long distance, fifty minutes of local usage, and ten minutes of three-way calling. Some subscriber access customers place no calls whatsoever. These services are produced in variable proportions, and for this reason the loop costs are directly attributable to subscriber access service itself.

Kahn and Shew's fourth argument is that loop costs result from providing access itself, even though other services may benefit from such access. Economics clearly indicates that the cost of any activity or service is conceptually independent of the benefit produced. The cost of providing a customer with a gallon of water is independent of whether the customer drinks it or fills a water balloon. Similarly, loop costs are directly attributable to subscriber access regardless of whether the loop provides value in some way to other services, customer activities, or even other customers.

Fifth, competitive markets may provide free rides.<sup>16</sup> Opponents of Kahn and Shew claim that long-distance service requires or benefits from a local telephone network<sup>17</sup> and that long-distance service should therefore pay for a portion of the costs of the local network. In particular, they claim that in such instances unregulated markets would not provide a free ride for long-distance service. However, Kahn and Shew do provide examples of unregulated markets in which free or nearly free rides occur.

Sixth, telecommunications service pricing is not a zero-sum game.<sup>18</sup> Changing the prices of telecommunications services to reflect more closely cost and demand characteristics can lead to welfare gains (real gains to consumers and producers), while price changes in the opposite direction can lead to welfare losses. For example, consumers may be better off facing higher subscriber access service prices and, as a result, lower usage prices.

Kahn and Shew also address four empirical issues relevant in determining the components of loop costs that are properly attributable to subscriber access rather than directly attributable to other services.<sup>19</sup> Their discussion sparked a recent debate, which has produced additional support for the position that loop

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16. Kahn & Shew, *supra* note 1, at 207. Although correct, this issue is relatively unimportant and unpersuasive for purposes here.

17. Although this claim has some intuitive appeal, it does not withstand careful analysis. For example, a telecommunications network, designed only for long-distance service, would likely be designed only to serve high-use business customers and densely concentrated, short loop, residential, and business customers.

18. Kahn & Shew, *supra* note 1, at 208. With a true zero-sum game, society would be indifferent between different pricing regimes to recover the same total costs of providing multiple services.

19. *Id.* at 210-22; see Kahn & Shew, *infra* note 49.

costs are predominately caused by the provision of subscriber access.<sup>20</sup> Although important, these issues are largely beyond the scope of this Article.<sup>21</sup>

## II. Responses to Kahn and Shew

The 1987 article by Kahn and Shew has received some recognition in the economics<sup>22</sup> and legal communities,<sup>23</sup> yet it has been cited rarely by the Federal Communications Commission (FCC) in its orders<sup>24</sup> and has received almost no attention in state public utility commission orders.<sup>25</sup> Arguments for and against the Kahn and Shew position do appear in discussions, presentations, papers, comments in and testimony before regulatory commissions, and in

20. See Alfred E. Kahn, *Pricing of Telecommunications Services: A Comment*, 8 REV. INDUS. ORG. 39 (1993); William E. Taylor, *Efficient Pricing of Telecommunications Services: The State of the Debate*, 8 REV. INDUS. ORG. 21, 23 (1993); see also Lester D. Taylor, *Pricing of Telecommunications Services: Comment on Gabel and Kennet*, 8 REV. INDUS. ORG. 15, 16 (1993). Although not part of the recent debate, WENDERS, *supra* note 2, provides additional support for the position taken by Kahn and Shew. *But see* Gabel & Kennet, *supra* note 14, at 1-3; cf. Dalton & Mann, *supra* note 14.

21. One of the major implications of this debate is discussed as item eight in Part III below.

22. See, e.g., 1 ALFRED E. KAHN, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS* xvii n.5 (2d ed. 1988); Gabel & Kennet, *supra* note 14; Kahn, *supra* note 20; Dalton & Mann, *supra* note 14; Lester Taylor, *supra* note 20; William Taylor, *supra* note 20; see also JAMES C. BONBRIGHT ET AL., *PRINCIPLES OF PUBLIC UTILITY RATES* 661 (2d ed. 1988); BRIDGER M. MITCHELL & INGO VOGELSSANG, *TELECOMMUNICATIONS PRICING* 155 (1991); Marcus Alexis et al., Report of the Blue Ribbon Telecommunications Task Force to the Illinois Commerce Commission 21 n.22 (Jan. 1991) (on file with the author).

23. See, e.g., MICHAEL K. KELLOGG ET AL., *FEDERAL TELECOMMUNICATIONS LAW* 428 n.25, 432 n.1, 452 n.10, 453 n.15, 465 n.23, 466 n.26 (1992); Frank P. Dart, *Deregulation of Telephone Services in Ohio*, 24 ADMIN. L. REV. 229, 237 n.50, 247 n.131, 306 n.614, 316 n.672 (1990), reprinted in 15 PULA 103 (1992); James M. Fink, *The Battle Over the Rewrite of Illinois' Telecommunications Law: Is More Reform Needed?*, 11 N. ILL. U. L. REV. 189, 196 n.28 (1991), reprinted in 15 PULA 527, 536 n.28 (1992); David Gabel, *Divestiture, Spin-Offs, and Technological Change in the Telecommunications Industry—A Property Rights Analysis*, 3 HARV. J.L. & TECH. 75, 101 n.114 (1990); Alfred E. Kahn, *Deregulation: Looking Backward and Looking Forward*, 7 YALE J. ON REG. 325, 337 n.28, 346 n.47 (1990); Alexander C. Larson, *Costs, Allocations, and Regulatory Issues*, *TELEMATICS* Apr. 1988, at 11, 18 n.2; Alexander C. Larson, *Cost Allocations, Predation, and Cross-Subsidies in Telecommunications*, 14 J. CORP. L. 377, 378 (1989), reprinted in 12 PULA 283, 286 n.3 (1989); Alexander C. Larson et al., *Competitive Necessity and Pricing in Telecommunications Regulation*, 42 FED. COMM. L.J. 1, 29 (1989), reprinted in 13 PULA 219, 249 n.86 (1990); Alexander C. Larson & Mark P. Sievers, *On the Ineffectiveness of Price Floors in Telecommunications Regulation*, 25 WILLAMETTE L. REV. 89, 120 n.103 (1989); Alexander C. Larson & Terrence J. Schroeffer, *New Telecommunications Technologies and Regulation: The Case of Personal Communications Services*, 6 HIGH TECH. L.J. 271, 286 n.33 (1991); Warren G. Lavey, *Innovative Telecommunications Services and the Benefit of the Doubt*, 27 CAL. W. L. REV. 51, 59 n.40, 72 n.110 (1990-1991); Mark E. Meitzen, *Diversification of Telephone Company Service Offerings and Cash Cow Economics: Who Gets Milked?*, *UTIL. POL'Y*, Oct. 1990, at 43, 52 n.3; Mark E. Meitzen & Terrence J. Schroeffer, *The LECs' Transition to Full Competition: The Response of Regulation*, *COMPUTER LAW*, June 1990, at 22, 26 n.19; Dennis L. Weisman, *Default Capacity Tariffs: Smoothing the Transitional Regulatory Asymmetries in the Telecommunications Market*, 5 YALE J. ON REG. 149, 149 n. 3 (1988); Richard J. Pierce, Jr., *Price Level Regulation Based on Inflation Is Not an Attractive Alternative to Profit Level Regulation*, 84 NW. U. L. REV. 665, 686 n.102 (1990) (book review).

24. See *In re* Policy and Rules Concerning Rates for Dominant Carriers, *Report and Order and Second Further Notice of Proposed Rulemaking*, 4 FCC Rcd. 2873 (1989).

25. It appears that the article by Kahn and Shew has only been cited in one state commission order, *In re* Pacific Northwest Bell Telephone Company, 114 Pub. Util. Rep. 4th (PUR) 299 (Or. P.U.C. 1990).

commission orders to the telecommunications industry. In addition, the Kahn and Shew position<sup>26</sup> that loop costs are not common costs also appears in unpublished manuscripts and in comments to, testimony before, and the orders of state public utility commissions.<sup>27</sup>

Prior to Kahn and Shew, many argued that loop costs were common costs.<sup>28</sup> These arguments have appeared in the economics literature,<sup>29</sup> and continue to appear in unpublished manuscripts and in comments to, testimony

26. This refers to the argument and is not intended to imply that the article by Kahn and Shew was referenced or known.

27. TEX. ADMIN. CODE tit. 16, § 23.91, 18 Tex. Reg. 5723, 5728 (1993) (for differing reasons, AT&T, the GTE Companies, and SWB object to the language in subsection (d)(6) that requires the LECs to exclude the costs associated with the Network Access Channel Basic Level (NACBL) and Network Access Channel Connection Basic Level (NACCBL) from the LRIC studies for residential and business basic local exchange service); WENDERS, *supra* note 2; *see, e.g., In re Inquiry into Policies and Programs to Assure Universal Telephone Service in a Competitive Environment, Comments of Southwestern Bell Telephone Company*, Southwestern Bell Telephone Company, 14 n.5, Dec. 16, 1993 (FCC RM-8388); *In re NARUC's Request For a Notice of Inquiry Concerning Access Issues, Comments of Southwestern Bell Telephone Company*, appendix 11, 12, Sep. 2, 1993 (undocketed petition before the FCC) [hereinafter *SWBT's NARUC Comments*]; *In re NARUC's Request For a Notice of Inquiry Concerning Access Issues, MCI's Comments on National Association of Regulatory Utility Commissioners' Petition for Notice of Inquiry Addressing Access Issues*, MCI Telecommunications Corporation, DA 93-84, Sep. 2, 1993, at 13-14 (undocketed petition before the FCC) [hereinafter *MCI's Comments in DA 93-84*]; *In re NARUC's Request For a Notice of Inquiry Concerning Access Issues, Reply Comments of Southwestern Bell Telephone Company*, appendix 11, 12, Sep. 2, 1993 (undocketed petition before the FCC); *In re Rulemaking on LEC Cost Methodology, Joint Comments of GTE Southwest Incorporated and Contel of Texas, Inc. on Proposed Local Exchange Carrier Cost Methodology Rule*, Project No. 9075, at 15 (Tex. P.U.C. May 1993) [hereinafter *GTE's 9075 Comments*] ("However, the loop or NAC is not a cost common to other services or BNFs. It is a separate component of the GTE Companies' networks and should be treated as such."); *cf.* Alfred E. Kahn, *The Road to More Intelligent Telephone Pricing*, 1 YALE J. ON REG. 139, 140, 142, 143 (1984).

28. *See In re Chesapeake and Potomac Telephone Company*, 57 Pub. Util. Rep. 4th (PUR) 367 (D.C. P.S.C. 1984) ("Where C&P treats access costs as 'direct' in nature, OPC views them as a common cost, arguing that the access line is used jointly by local and toll services."); *In re Mountain States Telephone and Telegraph Company*, 71 Pub. Util. Rep. 4th (PUR) 598 (Utah P.S.C. 1985) ("Mr. Buckalew . . . contended that there is no economic rule governing the assignment of common costs, such as loop costs."); *In re New England Telephone and Telegraph Company*, 62 Pub. Util. Rep. 4th (PUR) 503 (Vt. P.S.B. 1984) ("Therefore, the joint cost of the access line should not be charged all to local calling."); *see also In re Southwestern Bell Telephone Company*, 58 Pub. Util. Rep. 4th (PUR) 82 (Ark. P.S.C. 1984) ("This latter argument—that local service should bear all the fixed costs of the local system—flies in the face of common sense and contemporary economic theory about sharing of joint and common costs . . ."); *In re New England Telephone and Telegraph Company*, 55 Pub. Util. Rep. 4th (PUR) 296 (Vt. P.S.B. 1983) ("[T]he loop costs or access line costs would either be considered common costs or would be allocated to the message or usage portion because that is where the revenue is derived . . ."); *cf.* Basil L. Copeland, Jr. & Alan Severn, *Price Theory and Telecommunications Regulation: A Dissenting View*, 3 YALE J. ON REG. 53, 69 (1985) ("This approach does not, however, support the use of fixed charges for the pricing of access, primarily because consumers do not demand access for its own sake."); *In re Mountain States Telephone and Telegraph Company*, 82 Pub. Util. Rep. 4th (PUR) 64 (Colo. P.U.C. 1987) ("[T]he commission found that determining cost of service according to a long-run incremental cost study, as proposed by the company, could result in the basic exchange service market becoming a sump into which all joint and common costs are thrown.")

29. *See Gabel & Kennet and Dalton & Mann, supra* note 14.



before, and orders of regulatory commissions.<sup>30</sup> In some instances, arguments are inconsistent on whether loop costs are common costs.<sup>31</sup>

Kahn and Shew's position on loop costs has not been embraced due to the analytical complexity of the topic and continued misunderstanding in the economics of cost analysis. Counterarguments, although often false, sound initially appealing. In addition, as the article by Kaserman and Mayo in this issue of the *Yale Journal on Regulation* suggests, regulators may be reluctant to accept the Kahn and Shew position because it supports higher rates for subscriber access service. Beyond the complexity of the topic, it may be that regulators fear the political backlash from basic telephone customers facing such rate increases.<sup>32</sup>

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30. See, e.g., *In re Contel of Illinois, Inc.*, 119 Pub. Util. Rep. 4th (PUR) 284 (Ill. C.C. 1991) [hereinafter *Contel*] ("Contel indicates that CUB's analysis begins with the incorrect premise that Contel assigned all common and joint costs to either local access or usage."); *In re Extended Area Service*, 104 Pub. Util. Rep. 4th (PUR) 239 (Or. P.U.C. 1989) ("The costs assigned to EAS can be grouped into three categories, switching and transport, overhead, and contribution to joint loop costs."); *In re Generic Investigation Into Intralata Toll Competition Access Rates*, Order No. 20,864, 1993 WL 475294, at \*2 (N.H. P.U.C. 1993) ("[T]he Commission concluded that NET's claim of subsidy was based on the mistaken and misleading assumption that the non-traffic-sensitive (NTS) costs of the local loop should be assigned exclusively to basic exchange services."); Petition of MFS Communications Company, Inc., for a Notice of Inquiry and *En Banc* Hearing at 14, *In re Inquiry into Policies and Programs to Assure Universal Telephone Service in a Competitive Environment*, (Nov. 1, 1993) (FCC RM-8388) ("First, the major purposed subsidy identified by the LECs is based on a comparison of subscriber loop costs and monthly local exchange service rates. This ignores the fact that subscriber loops provide access to all current and future telecommunications services, not just to local exchange service, and therefore are the archetypical joint and common cost of the network."); *In re National Association of Regulatory Utility Commissioners Petition for Notice of Inquiry Addressing Access Issues, In re NARUC's Request For a Notice of Inquiry Concerning Access Issues June 25, 1993* (undocketed petition before the FCC) [hereinafter *NARUC's Request*] ("Subscriber loop costs would be considered shared costs for switch-based services . . . ."); *In re New England Telephone and Telegraph Company*, 1991 WL 494307 at 6-7 (NH PUC 1991) ("Since NTS accounts for approximately 70% of total incremental costs, NET's allocation of all such loop costs to basic exchange results in grossly overstating the incremental cost of providing local service and grossly understating the incremental cost of providing toll services."); *In re Southern New England Telephone Company*, Docket No. 92-09-19, 1993 WL 378949 at \*103 (Conn. D.P.U.C. 1993) [hereinafter *SNET*] ("The Department also ordered the Company to propose plans for the allocation of local loop and common costs (categories 10 and 11, respectively) to the other ten major service categories.")

31. See, e.g., *In re Intrastate Access Costs and Intrastate Access Charges*, No. 05-TR-103, 1991 WL 426385, at \*10 (Wis. P.S.C. 1991) [hereinafter *Wis. Access*] ("Any allocation of common costs is inherently arbitrary, but the allocation of investment and expenses incurred for the local loop is particularly difficult because this investment is needed just to provide dial tone and the opportunity to make or receive a telephone call, whether or not calls are actually made or received."); see also *In re Amendment of Part 67 of the Commission's Rules and Establishment of a Joint Board, Notice of Proposed Rulemaking and Order Establishing a Joint Board*, 78 F.C.C.2d 837 (June 1980) ("It states that in considering the allocation of jointly used NTS plant, there is by definition no cost imposed by the usage of such plant. Therefore, there is no non-arbitrary method to allocate the costs of NTS plant. The manual should operate so as to ensure that all interexchange services pay a fair share of the cost of exchange facilities they use in common with local services.")

32. See David L. Kaserman & John W. Mayo, *Cross-Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing*, 11 *YALE J. ON REG.* 119, 143 (1994).

### III. Further Support for Kahn and Shew's Loop Cost Position

Eight additional arguments not presented by Kahn and Shew on the appropriate treatment of loop costs further explain why loop costs are directly attributable to subscriber access and are not common costs. These arguments fall into three categories: historical accident, separate perspectives and concepts, and logical consistency.

#### A. *A Historical Accident*

First, the historical use of the phrase "common line" can be confusing. Common line refers specifically to asset allocation purely for regulatory purposes. Local telephone companies are regulated in the federal jurisdiction by the FCC and by state public utility commissions for intrastate services. Rate-of-return regulation in multiple jurisdictions necessarily requires the full allocation of investments, expenses, and revenues to the individual jurisdictions of regulation. This process is known as "separations and settlements."<sup>33</sup> In this process a portion of the loop costs, called common line costs, is allocated to the federal (interstate) jurisdiction. However, the phrase "common line" has no economic meaning. The process of separations is only relevant to the arbitrary split of revenue requirement for local telephone companies across jurisdictions; these allocations and the terms surrounding them are unrelated to economic costs.<sup>34</sup> Unfortunately, the prevalence of the common line terminology continues to obfuscate the nature of the cost of providing subscriber access.

#### B. *Separate Perspectives and Concepts*

Second, in dealing with the costs of subscriber access, it is easy to confuse the perspectives of the customer and the service provider. Although the price for subscriber access may be a common cost to the customer, loop costs are not necessarily common production costs to the local telephone company. It is certainly possible that a customer may purchase subscriber access for multiple activities. For example, consider a hypothetical firm that has two products—computer network consulting, provided locally, and personal computer software, sold internationally. All the local telephone calls made by the firm are for its computer network consulting, while all its long-distance calls are made specifically for its software products. The firm pays a monthly fee of \$30 for subscriber access and pays separate charges for local and long-

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33. See, e.g., WENDERS, *supra* note 2, at 173; Peter Temin & Geoffrey Peters, *Is History Stranger than Theory? The Origins of Telephone Separations*, 75 *ECON. HIST.* 324 (1985).

34. Cf. Kahn & Shew, *supra* note 1, at 194-99.

distance calls. This firm may well consider the \$30 subscriber access fee to be a cost common to the provision of its two products, consulting and software.

A customer's use of subscriber access service and its role in the customer's cost function have no bearing on whether these costs are common or directly attributable.<sup>35</sup> Surely the cost to a local telephone company of providing a service is not a common cost simply because customers use the service for multiple activities.<sup>36</sup> This distinction between cost to the customer and to the provider is critical to a sound understanding of telecommunications costs.<sup>37</sup> Economic principles indicate that most loop costs are directly attributable to and caused by access to the network; such costs are not common or shared costs to the local telephone company. When, under a franchise obligation, a forecast<sup>38</sup> indicates the need for an additional line for access to the public switched network, certain undeniable costs are incurred by the local telephone company.

Third, one should avoid confusing the concepts of revenues and costs. Cross-elastic or spill-over revenue effects and producer costs are independent economic phenomena.<sup>39</sup> Revenue effects are a function of customer demand, while producers' costs are determined largely by input prices. Certainly subscriber access service, local usage, and long-distance usage are likely to be cross-elastic to some degree on the revenue or demand side.<sup>40</sup> But while the existence of a strong complementary effect between services may provide some

35. Rejecting this argument (for example, by accepting arguments that loop costs are common costs because the customer uses the loop for many things) leads to a variety of logically untenable results. For instance, a telephone company providing only a single product, subscriber access, would have its costs classified as common costs despite having no other products to share the common cost. Such faulty reasoning would lead to the conclusion that the cost to a highway department of constructing a segment of highway would be considered a common cost to butchered meats, milk, stereo equipment, and dry cleaning if each of the stores distributing these products were to use the section of highway to receive its products. Similarly, a car would be classified as a common cost to motels since they are used to drive to motels. These implications fly in the face of common sense; the premise on which they are based is simply wrong.

36. If this were true, it would lead to the peculiar result that loop costs are common costs when used to provide subscriber access to some customers, those using the service for multiple activities, but not common when providing service to other customers. As customers move, the same loop would be considered common at some points in time but not at others.

37. For example, Gabel and Kennet state, "We argue that access is a joint input which provides the ability to place or receive local and toll calls." Gabel & Kennet, *supra* note 14, at 3. Their use of the term input reflects their implicit focus on the use of subscriber access by customers, not by other companies. They have analyzed the cost of access to the customer as an input into the customer's activities, not the cost to the local telephone company of providing access. William Taylor provides a lucid response to Gabel and Kennet; he notes, "The adjective 'joint' is used somewhat loosely in this section of their paper, and their meaning is not clear to economists." William Taylor, *supra* note 20, at 27.

38. The franchise obligation requires local telephone companies to provide service in a timely manner to all customers demanding the service; accordingly, the forecast of future demand triggers the expenditure. The implications of franchise obligations are also discussed in Part IV.

39. *Cf.* WENDERS, *supra* note 2, at 177.

40. More precisely, one expects the coefficient of cross-price elasticity of demand between these services to be negative, that is, the services are complements in consumption. See generally JACK HIRSHLEIFER, PRICE THEORY AND APPLICATIONS 116, (1976) (providing a standard definition of cross-elasticity and specifying a negative sign for complements); see also Kahn & Shew, *supra* note 1, at 251-52.

rationale for pricing one of the complements lower,<sup>41</sup> cross-elastic revenue effects do nothing to change the fundamental nature of the costs of providing the services. Loop costs are not common to the provision of local and long-distance usage simply because customers consider these services to be complements.

Fourth, the direct link between loop costs and subscriber access becomes clear when telecommunications services such as customer access and local usage are unbundled. An unbundled offering of subscriber access and local usage is generally termed local measured service or local message service.<sup>42</sup> Under such arrangements, customers pay separate charges for access and local use. Most telephone customers, particularly residential customers, purchase a bundled offering of subscriber access and unlimited local usage, often called flat rate service. Some claim that loop costs are directly attributable to basic local service, including flat rate service.<sup>43</sup> Such claims create confusion because loop costs are not caused by local usage, yet they are billed as a component of flat rate basic service. Providing subscriber access causes loop costs; they are not caused by local service, long-distance service, or services such as three-way calling. Considering only bundled offerings of subscriber access and local usage, one may mistakenly conclude that Kahn and Shew imply that loop costs are caused by local usage but not by toll usage.<sup>44</sup> In a local message or measured service environment, it becomes clear that loop costs are not caused by local use, but by subscriber access, a distinct service separately identified on the customer's bill. In a local measured service environment, revenues and costs are clearly separated.

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41. For example, a net incremental cost test, such as a burden test, incorporates cross-elastic revenue effects. See WILLIAM J. BAUMOL, *SUPERFAIRNESS: APPLICATIONS AND THEORY* 117 (1986) ("This requires the investigator to take into account the cross-elasticities among the firm's own products in determining whether the incremental revenues of product *i* are sufficient to cover its incremental costs."); cf. WILLIAM J. BAUMOL & J. GREGORY SIDAK, *TOWARD COMPETITION IN LOCAL TELEPHONY* 110-12 (1994); Alexander C. Larson & Steve G. Parsons, *Telecommunications Regulation, Imputation Policies, and Competition*, 16 HASTINGS COMM & ENT. L.J. (forthcoming 1994) (manuscript on file with the author). In these articles the use of foregone contribution from one product is considered an opportunity cost for another product. This is an application of a net incremental cost test or burden test. If complements in consumption are involved, a net incremental cost test will yield lower subsidy-free prices. However, Baumol himself suggests the gross-incremental cost test as the relevant test of fairness to competitors. See BAUMOL, *supra*, at 118-19. The gross test ignores cross-elastic effects.

42. Generally, local message service is only monitored or measured by frequency of calling. Local measured service may also be monitored for distance, duration, and time of day of calls.

43. Technically the claim is correct since part of the cost of providing the bundled offering of flat rate basic service is the cost of subscriber access. The issue here is to find the method of explanation that is not only technically correct, but is least likely to be misunderstood.

44. See Contel, *supra* note 30; Wis. Access, *supra* note 31.

### C. Logical Consistency

Arguments that loop costs are common costs are often internally inconsistent or are inconsistent with other developments of modern telecommunications.

Fifth, loop costs cannot be common to local and long-distance services, since this would imply that the cost of providing subscriber access is common across local and long-distance companies. Current law precludes regional Bell operating companies (RBOCs) from offering interLATA<sup>45</sup> long-distance service.<sup>46</sup> Generally, local telephone companies (often RBOCs) provide subscriber access and local telephone service, while separate long-distance companies (such as AT&T) offer interLATA long-distance service. The loop costs that enable all these services cannot be common to local and long-distance calling since costs cannot be common among independent companies.<sup>47</sup> Costs by their nature are specific to companies or decision-making agents.<sup>48</sup>

Sixth, Kahn and Shew address four empirical issues that are largely related to whether loop costs are directly attributable to subscriber access.<sup>49</sup> Regardless of the position one takes on these four empirical issues, each position concludes that loop costs are directly attributable to individual services and not somehow common across multiple services. One cannot agree with Kahn and Shew on the empirical arguments and also argue that loop costs are common costs.<sup>50</sup> Their arguments suggest that loop costs are attributable directly to either subscriber access or some other service, but exclude arguments that loop costs are common. The empirical issues and the arguments surrounding them imply that the costs are directly attributable to individual

45. Local Access Transport Areas (LATAs) represent the geographic line of demarcation between the RBOCs and AT&T.

46. See *United States v. Western Elec. Co.*, 569 F. Supp. 990, 1057 (D.D.C. 1983).

47. One firm may make a decision and take an action that causes external costs for other economic agents—a negative externality. See generally PAUL HEYNE, *THE ECONOMIC WAY OF THINKING* 288, 326 (5th ed. 1987). However, a negative externality is not relevant here. Furthermore, it appears that the notion of a negative externality has not been advanced to support the claim that loop costs are common.

48. See, e.g., JAMES M. BUCHANAN, *COST AND CHOICE: AN INQUIRY IN ECONOMIC THEORY* 43 (1969).

49. Briefly, the four empirical issues stated as contentions are: (1) designing the network for long-distance calling causes a portion of the costs; (2) higher levels of usage cause more and longer loops; (3) loop costs associated with network upgrades are caused by new services and not "plain old telephone service;" and (4) the marginal cost of subscriber access is markedly below the average revenue requirements associated with providing it. These contentions are not supported by Kahn and Shew. See Kahn & Shew, *supra* note 1, at 210-22. Contention (1) appears to be particularly irrelevant to policy decisions. Even if this position is correct, one can consider the service of subscriber access as access to the public switched network in its entirety and not as access simply to the local switched network or the intra-office network. More importantly, these issues are largely irrelevant to policy determinations of cost recovery methods. See Kahn & Shew, *supra* note 1, at 223; see also WENDERS, *supra* note 2.

50. This conclusion is true regardless of the side of the debate one chooses. If one believes, as in empirical issue (2), that higher levels of usage do in fact cause more loops and longer loops, leading to higher loop costs, then these costs are directly attributable to usage services and are not common costs.

services—subscriber access, local, and long-distance usage—and are not common to a group of services.

Seventh, the notion that loop costs are common costs conflicts with emerging concepts of unbundling local-type services. In recent years, the ideas of unbundling and Open Network Architecture (ONA) have received a great deal of attention in telecommunications,<sup>51</sup> and the building block methods for calculating costs at the functional level, rather than the service level, have been proposed.<sup>52</sup> Simply put, these developments call for costs to reflect basic network functions—access, switching, transport, etc.—rather than services like local and long-distance calling. The loop function in some proposals has been called the Network Access Channel (NAC).<sup>53</sup> In some instances, building block proposals have suggested that loop costs be treated as common costs.<sup>54</sup> However, by definition, the concept of the NAC as a separate function with a separate cost is logically inconsistent with the notion of loop costs as common costs. In essence, proposals that claim that subscriber loop costs should be

51. See Amendment of Sections 64.702 of the Commission's Rules and Regulations, (*Computer III*), Phase I, *Report and Order*, 104 F.C.C.2d 958 (1986) (*Phase I Order*) (replacement of structural separation with nonstructural safeguards such as Comparably Efficient Interconnection in the short term and Open Network Architecture in the long run), *recon.*, 2 F.C.C.R. 3035 (1987), (*Phase I Reconsideration Order*), *further recon.*, 3 F.C.C.R. 1135 (1988) (*Phase I Further Reconsideration Order*), *second further recon.*, 4 F.C.C.R. 5927 (1989) (*Phase I Second Further Reconsideration Order*), *Phase I Order* and *Phase I Reconsideration Order vacated sub nom.*, *California v. FCC*, 905 F.2d 1217 (9th Cir. 1990) (*California*); Phase II, 2 F.C.C.R. 3072 (1987) (*Phase II Order*), *recon.*, 3 F.C.C.R. 1150 (1988) (*Phase II Reconsideration Order*), *further recon.*, 4 F.C.C.R. 5927 (1989) (*Phase II Further Reconsideration Order*), *Phase II Order vacated sub nom.*, *California v. FCC*, 905 F.2d 1217 (9th Cir. 1990); Filing and Review of Open Network Architecture Plans, Phase I, *Memorandum Opinion and Order*, 4 FCC Rcd. 1 (1988) (*BOC ONA Order*); *Memorandum Opinion and Order*, 5 FCC Rcd. 3103 (1990) (*BOC ONA Amendment Order*); *Memorandum Opinion and Order on Reconsideration*, 5 FCC Rcd. 3084 (1990) (*ONA Reconsideration Order*), *appeal pending sub nom.*, *California v. FCC*, No. 90-70336 and Consolidated Cases (9th Cir.), filed July 5, 1990; *Memorandum Opinion and Order*, 6 FCC Rcd. 7646 (1991) (*BOC ONA Further Amendment Order*), *aff'd*, *MCI v. FCC*, No. 92-70189 (9th Cir.), Sept. 23, 1993; *In re Computer III Remand Proceedings*, *Notice of Proposed Rulemaking*, 5 FCC Rcd. 5242 (1990) (*ONA Remand NPRM*); *Report and Order*, 5 FCC Rcd. 7719 (1990) (*ONA Remand Order*), *aff'd*, *California v. FCC*, No. 90-70336 and Consolidated Cases (9th Cir.), Sept. 23, 1993; *In re Separation of Costs of Regulated Telephone Service from Costs of Nonregulated Activities*, *Report and Order*, 2 F.C.C.R. 1298 (1987) (requiring the Tier I local exchange carriers to develop Cost Allocation Manuals as a nonstructural safeguard in lieu of structural separation). For a concise history of ONA, see Chris L. Kelley, *The Contestability of the Local Network: The FCC's Open Network Architecture Policy*, 45 FED. COMM. L.J. 89, 90-115 (1992); see also BAUMOL & SIDAK, *supra* note 41, at 121-24.

52. See, e.g., NARUC's Request, *supra* note 30; TEX. ADMIN. CODE tit. 16, § 23.91, 18 Tex. Reg. 5723, 5728 (1993) (the term Basic Network Function or BNF was used rather than the term building block). In general, directly attributable costs of basic network functions rather than services should be calculated. Often, these proposals imply a framework for future unbundling of services. *But see*, e.g., SWBT's NARUC Comments, *supra* note 27; GTE's 9075 Comments, *supra* note 27.

53. See TEX. ADMIN. CODE tit. 16, § 23.91, 18 Tex. Reg. 5723, 5734, 5735 (1993).

54. See NARUC's Request, *supra* note 30; TEX. ADMIN. CODE tit. 16, § 23.91, 18 Tex. Reg. 5723, 5728 (1993). However, other building block proposals and other proponents of building blocks do not support the notion of loop costs as common costs. See, e.g., MCI's Comments in DA 93-84, *supra* note 27, at 13-14 ("Secondly, the AIWG Report modifies the Building Blocks methodology by requiring that the subscriber loop, or Network Access Channel ("NAC") and Network Access Channel Connection in the Oregon terminology, be regarded as a shared cost of switch-based services. MCI does not support either of the modifications to Building Blocks suggested by the AIWG Report (footnote omitted).").

considered shared costs for switch-based services imply that building block principles should not be applied to loop costs. Such an approach is inconsistent and economically untenable. Similarly, the concept of unbundling loop/NAC functionality from other functions is logically inconsistent with the concept of loop costs as common costs. It would not appear possible to unbundle a component that is a common cost, or to unbundle a component that creates joint products.

Eighth, the notion that loop costs are common costs contradicts accepted cost concepts for non-local services. Loop costs for private line service, special access, or Centrex service<sup>55</sup> are directly attributed to the service to which the loop is dedicated. Implicitly, it has been accepted generally that loop costs for such services are directly attributable to the access component of these services. However, each of these services can in and of themselves have several service components. For instance, Centrex service provides intercom calling (like a limited local call), long-distance calling,<sup>56</sup> and a host of vertical features such as three-way and speed calling. The generally accepted cost methods for Centrex calculate loop costs separately, for example, as a directly attributable category; loop costs are not considered a common cost of all of the Centrex options that might be purchased.<sup>57</sup> Also, as customers move or change service, the loop costs that were considered directly attributable to the access component of a Centrex system in one year cannot logically be considered a common cost the following year when the same loop is used to provide subscriber access to residential customers.

These eight points affirm Kahn and Shew's position and strengthen the case for attributing loop costs directly to subscriber access service rather than considering such costs as common costs to be recovered by all services. The approach recommended here creates consistent and symmetric treatment of services, it attributes costs to the parties causing them, and it provides the proper cost standard for sound legal, business, and public policy.

#### IV. Policy Implications

Kahn and Shew's position that loop costs are not common costs has important implications for telecommunications law and policy. It affects the methods used in calculating costs and decisions that depend on cost information. In both business and public policy, cost information is important

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55. This is a PBX-like business service that uses the local phone company's switch to perform the PBX functions; in some jurisdictions it is called Plexar.

56. Generally, some proportion of Centrex lines will be blocked from providing long-distance or other outside calls.

57. Centrex cost methods and Centrex cost calculations certainly are sometimes challenged by PUC staff or by intervenors in state regulatory proceedings. However, the challenges do not appear to suggest that the loop costs should be considered as common costs.

for service pricing, entry, and exit. Proper cost information is necessary for testing for cross-subsidies and for determining the level of economically efficient service prices. It also has important implications for defining the franchise obligation of local telephone providers and for unbundling policies.

#### A. *Economic Efficiency and Cross-Subsidy*

Unlike discussions of whether common costs should be allocated to individual services, the issue of whether loop costs are common or directly attributable, and as such, marginal, affects proper economic policy recommendations.<sup>58</sup> Economic efficiency requires that service prices be set at their respective marginal costs.<sup>59</sup> However, for local telephone company services, such prices do not provide revenue sufficient for recovery of total costs since marginal cost does not include the common costs that are required for operation of the company. Therefore, first-best efficient prices (prices equal to marginal costs) are not economically viable.<sup>60</sup> Second-best, or Ramsey-efficient prices, are set according to marginal costs, demand elasticities, and the total cost of the firm.<sup>61</sup> Accepting the Kahn and Shew position does nothing to change calculations of the total costs of the firm, but it has a great effect on the calculated level of marginal costs for local service.<sup>62</sup> If loop costs are considered to be common costs, the marginal cost of subscriber access will be very low (or perhaps zero) and the common costs to be recovered by all services will be relatively high. In contrast, if loop costs are accepted as directly attributable to subscriber access, then marginal costs for access will be high and common costs relatively low. Accepting the Kahn and Shew position leads to higher efficient<sup>63</sup> prices for subscriber access and lower Ramsey-efficient prices for other services.<sup>64</sup>

Accepting Kahn and Shew's position affects the cross-subsidy test for local service and the range of subsidy-free prices for services in general, and raises

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58. Allocations of common costs have no economic meaning. See *infra* note 70 and accompanying text. However, the determination of the marginal or directly attributable cost of a service is important economic information. The choice between methods of identifying such cost, which yield substantially different results, has important economic implications.

59. For the purposes of this Article, marginal cost means the directly attributable costs or incremental costs of a service.

60. See Kahn & Shew, *supra* note 1, at 247.

61. The Ramsey-efficient price for each service is above its marginal cost (with independent demands) in an inverse proportion to its own price elasticity of demand; prices for less elastically demanded services exceed marginal cost to a greater extent than those of elastically demanded services. See Kahn & Shew, *supra* note 1, at 248.

62. The total cost of the firm is the sum of the marginal costs plus the common costs. Accepting or rejecting Kahn and Shew's position only affects the categorization of costs within the total.

63. Both first-best and Ramsey-efficient prices for subscriber access would be higher.

64. The effect will be dampened to some degree since local telephone service/subscriber access services have very low demand elasticities, and hence Ramsey-efficient prices for these services would diverge from their marginal cost to a greater degree than other service prices. Cf. Kahn & Shew, *supra* note 1, at 247-52.



subsidy questions that require legislative or regulatory treatment. By definition, a service receives a cross-subsidy if the revenue from the service does not exceed the incremental cost (the directly attributable cost) of providing the service.<sup>65</sup> Scope economies borne of common costs create a range of subsidy-free prices, and a higher proportion of common costs creates a broader range of subsidy-free prices. In essence, considering loop costs as common costs would greatly expand the range of subsidy-free prices for subscriber access by drastically reducing the lower bound of the range. Far lower prices for subscriber access would therefore be considered subsidy-free; this could create political and regulatory pressure to lower subscriber access prices and raise the prices of other services in order to recover the newfound common costs. In contrast, accepting the Kahn and Shew position makes the incremental costs for subscriber access relatively high and narrows the range of subsidy-free prices.<sup>66</sup> Relatively low subscriber access rates for residential and single-line business customers therefore require a public policy decision to subsidize these services explicitly.

The Kahn and Shew position on the cost of subscriber access also affects economically nonsensical cost manipulations such as fully distributed costs (FDC). FDC methods generally begin with a measure of the directly attributable costs of services and add an allocated portion of the common costs of the company to each service or even to each unit of service.<sup>67</sup> Such calculations continue to be surprisingly common.<sup>68</sup> If service prices are set equal to fully distributed costs, adopting the Kahn and Shew position will have a substantial effect on the pricing of telecommunications service: subscriber access prices will be higher and other service prices will be lower.<sup>69</sup> Fully distributed costs, however, have no theoretical foundation, are necessarily arbitrary, and cannot be used in any meaningful way to establish prices or set upper or lower bounds for pricing. They are useless for establishing a standard for cross-subsidy or

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65. See, e.g., BAUMOL, *supra* note 41; Gerald R. Faulhaber, *Cross-Subsidization: Pricing in Public Enterprises*, 65 AM. ECON. REV. 966 (1975); Gerald R. Faulhaber & Stephen B. Levinson, *Subsidy-Free Prices and Anonymous Equity*, 71 AM. ECON. REV. 1083 (1981).

66. The costs are higher than if they were considered common.

67. Generally, however, fully distributed costs employ embedded (historical) accounting measures of cost, while economic measures of cost are prospective.

68. See, e.g., SNET, *supra* note 30; Ron Choura & Robin Ancona, Report on Intrastate Cost Allocations for the NARUC Communications Committee and Subcommittee on Communications (October 1993) (on file with author). Of 38 states responding, 22 answered affirmatively to the question, "Does your Commission use a fully distributed cost methodology for ratemaking?" In the same survey, in questions about allocating any cost for providing basic local exchange service, 13% of respondents allocate to enhanced services, 8% to deregulated services, 8% to affiliated entities, and 21% to extended area service. These numbers may be understated if any of the respondents believe that loop costs are not part of the costs of providing basic local exchange service; in other words, that loop costs are common.

69. This relationship is relative to the prices resulting from rejecting the Kahn and Shew position. In many jurisdictions, however, local services such as subscriber access services for residential and small business customers appear to have been residually priced in the past. These prices are set after other service prices are established in order to cover the remaining total costs of the company.

anticompetitive practices. The academic literatures in the fields of economics, accounting, and law contain a wealth of articles condemning FDC methods as the basis for business or public utility policies.<sup>70</sup> In comparison, literatures contain very few favorable, rigorous analyses of FDC pricing.<sup>71</sup>

When loop costs are recognized as directly attributable to access, the way these costs are calculated will affect other fundamental cost issues. One such issue is whether long-run or short-run cost is the appropriate cost standard for business and public policy purposes.<sup>72</sup> Kahn and Shew suggest, at one point, that a long-run cost approach is more practical than the use of short-run costs,<sup>73</sup> although there is a substantial literature supporting the use of short-run marginal costs.<sup>74</sup> The very distinction between long- and short-run costs is

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70. See *In re Coal Rates Guidelines Nationwide*, 1 I.C.C.2d 520 (1985); COUNCIL OF ECONOMIC ADVISORS, 1965 ANNUAL REPORT 127 (1966); BAUMOL, *supra* note 41, at 134-36; JAMES C. BONBRIGHT ET AL., PRINCIPLES OF PUBLIC UTILITY RATES 481 (2d ed. 1988); J. MAURICE CLARK, STUDIES IN THE ECONOMICS OF OVERHEAD COSTS 14 (1923); ANN F. FRIEDLAENDER, THE DILEMMA OF FREIGHT TRANSPORT REGULATION 133 (1969); PAUL J. GARFIELD & WALLACE F. LOVEJOY, PUBLIC UTILITY ECONOMICS 140-41 (1964); WALTER B. MCFARLAND, CONCEPTS FOR MANAGEMENT ACCOUNTING 46 (1966); W.A. PATTON & A.C. LITTLETON, CORPORATE ACCOUNTING STANDARDS 121 (1940), *cited in* William J. Vatter, *Limitations of Overhead Allocation*, 20 ACCT. REV. 163 (1945); DUDLEY F. PEGRUM, PUBLIC REGULATION OF BUSINESS 194-98 (1965); CHARLES F. PHILLIPS, JR., THE ECONOMICS OF REGULATION 395-96 (1969); MILTON SPENCER ET AL., MANAGERIAL ECONOMICS: TEXT, PROBLEMS, AND SHORT CASES 367 (4th ed. 1975); ARTHUR L. THOMAS, THE ALLOCATION PROBLEM: PART TWO 156-57 (1974); WENDERS, *supra* note 2, at 174; William J. Baumol et al., *How Arbitrary is 'Arbitrary'?—or, Toward the Deserved Demise of Full Cost Allocation*, PUB. UTIL. FORT., Sept. 3, 1987, at 16; William J. Baumol et al., *The Role of Cost in the Minimum Pricing of Railroad Services*, 35 J. BUS. 357 (1962); William J. Baumol & Alfred G. Walton, *Full Costing, Competition and Regulatory Practice*, 82 YALE L.J. 639 (1973); William J. Baumol & Robert D. Willig, *Railroad Deregulation: Using Competition as a Guide*, 11 REG. 28 (1987); Ronald Braeutigam, *An Analysis of Fully Distributed Cost Pricing in Regulated Industries*, 11 BELL J. ECON. 182 (1980); Ronald Braeutigam, *Optimal Pricing With Intermodal Competition*, 69 AM. ECON. REV. 38 (1979); Ronald H. Coase, *The Theory of Public Utility Pricing and Its Application*, 1 BELL J. ECON. & MGMT. SCI. 113 (1970); John Dearden, *Cost Accounting Comes to Service Industries*, HARV. BUS. REV. (Sept.-Oct. 1978) at 132; Samuel Huntington, *The Rapid Emergence of Marginal Cost Pricing in the Regulation of Electric Utility Rate Structures*, 55 B.U. L. REV. 689 (1975); Kahn, *supra* note 23, at 150; Robert S. Kaplan, *One Cost System Isn't Enough*, HARV. BUS. REV., Jan.-Feb. 1988, at 61; Joseph R. Rose, *Regulation of Intermodal Rate Competition in Transportation*, 69 MICH. L. REV. 1011 (1971); George Sweeney, *Welfare Implications of Fully Distributed Cost Pricing Applied to Partially Regulated Firms*, 13 BELL J. ECON. 525 (1982); Haskell P. Wald, *The Theory of Marginal Cost Pricing and Utility Rates*, PUB. UTIL. FORT., June 22, 1967, at 15. See generally RAY H. GARRISON, MANAGERIAL ACCOUNTING: CONCEPTS FOR PLANNING, CONTROL, DECISION MAKING 594-96 (5th ed. 1988).

71. *But see* COST ALLOCATION: METHODS, PRINCIPLES, APPLICATIONS (H. Peyton Young ed., 1985). However, the fringe of the economics discipline that presents cost allocations in a positive light appears to use the term to mean relatively mechanical methods of constrained pricing, and the costs created by such calculations do not correspond to traditional concepts of economic costs. See Steve G. Parsons, *A Decision-Based Specification of Costs* 18 (May 28, 1993) (unpublished manuscript, on file with author).

72. Traditionally, long-run costs reflect circumstances where there is total factor variability, in other words, where no cost element is fixed in nature. Often, it is implied that there are no sunk costs in a long-run cost calculation.

73. Kahn & Shew, *supra* note 1, at 226. However, Kahn and Shew seem to suggest that short-run costs are appropriate in at least certain circumstances. See *id.* at 225, 240. Also, Kahn appears to present arguments in favor of using both long-run and short-run costs in an earlier work. See 1 ALFRED E. KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 71, 85-86 (1970).

74. See RAY REES, PUBLIC ENTERPRISE ECONOMICS (2d ed. 1976); Roland Andersson & Mats Bohman, *Short- and Long-Run Marginal Cost Pricing: On Their Alleged Equivalence*, 7 ENERGY ECON. 279 (1985); Gardner Brown, Jr. & M. Bruce Johnson, *Public Utility Pricing and Output Under Risk*, 59 AM. ECON. REV.

inconsistently treated in the economics literature and is potentially misleading to policy makers; it has little or no practical value.<sup>75</sup> As the industry continues to evolve, it is important that textbook concepts of long- and short-run costs do not constrain sound applied economics and sound public and legal policy. Sound policy requires that cost calculations properly reflect the economic costs caused by the decision in question, regardless of whether such calculations match either a theoretical long- or short-run calculation. Properly focusing on the effects of business and public policy decisions is important in evaluating loop costs as well as other costs.

## B. Franchise Obligation

Kahn and Shew's position also affects the franchise obligation of the local telephone company to provide subscriber access to all customers on a timely basis.<sup>76</sup> This franchise obligation, which requires local telephone companies to place facilities well in advance of actual demand, appears to cause a large proportion of loop costs. Once local telephone companies place the facilities, a large proportion of the costs will not be affected by such standard business

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119 (1969); John Craven, *Peak-Load Pricing and Short-Run Marginal Cost*, 95 *ECON. J.* 778 (1985); Jules Dupuit, *On the Measurement of the Utility of Public Works*, 8 *ANNALES DES PONTS ET CHAUSSEES* 255, 261 (2d ser. 1944), reprinted in *READINGS IN WELFARE ECONOMICS* 255 (Kenneth J. Arrow & Tibor Scitowsky eds., 1969); Ian S. Jones, *Distortions in Electricity Pricing in the UK: A Comment*, 47 *OXFORD BULL. ECON. & STAT.* 275 (1985); William Vickrey, *Efficient Pricing of Electric Power Service: Some Innovative Solutions*, 14 *RESOURCES & ENERGY* 157 (1992); Oliver E. Williamson, *Peak-Load Pricing and Optimal Capacity Under Indivisibility Constraints*, 56 *AM. ECON. REV.* 810 (1966). Also, Lester Taylor and William Taylor appear to believe that short-run marginal costs are relevant to analyzing at least portions of this issue. See L. Taylor, *supra* note 20, at 16; W. Taylor, *supra* note 20, at 23. But see MICHAEL A. CREW & PAUL R. KLEINDORFER, *THE ECONOMICS OF PUBLIC UTILITY REGULATION* (1986); FRIEDLAENDER, *supra* note 70; Michael A. Crew & Paul R. Kleindorfer, *Peak Load Pricing With a Diverse Technology*, 7 *BELL J. ECON.* 207 (1986); Mohan Munasinghe & Jeremy J. Warford, *Electricity Pricing: Theory and Case Studies*, in *ELECTRICITY ECONOMICS: ESSAYS AND CASE STUDIES* 1, 11, 12 (Ralph Turvey & Dennis Anderson eds., 1981); Gunter Schramm, *Marginal Cost Pricing Revisited*, 13 *ENERGY ECON.* 245 (1991); and M. D. E. Slater & G. K. Yarrow, *Distortions in Electricity Pricing in the U.K.*, 45 *OXFORD BULL. ECON. & STAT.* 317 (1983).

75. Parsons, *supra* note 71, at 13, 14; see also BONBRIGHT ET AL., *supra* note 70, at 661; WENDERS, *supra* note 2, at 204; Armen A. Alchian, *Costs and Outputs*, in *THE ALLOCATION OF ECONOMIC RESOURCES* (Moses Abramovitz ed., 1959), reprinted in *READINGS IN MICROECONOMICS* 159, 166 n.7 (William Breit & Harold M. Hochman eds., 2d ed. 1968); Armen A. Alchian, *Cost*, in 3 *INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES* 404, 410 (1969); Baumol et al., *supra* note 70, at 357, 359, 361; Louis De Alessi, *The Short Run Revisited*, 57 *AM. ECON. REV.* 450 (1967), reprinted in *READINGS IN MICROECONOMICS* 149, 157 (William Breit & Harold M. Hochman eds., 2d ed. 1968); James Earley, *Marginal Policies of "Excellent Managed" Companies*, 46 *AM. ECON. REV.* 44, 66 (1956); Peter Lewin & Steve G. Parsons, *Long Run Versus Short Run Costs of Electric Power Interruptions: A Cautionary Note*, 7 *ENERGY J.* 181 (1986); Lionel Robbins, *Remarks Upon Certain Aspects of The Theory of Costs*, 44 *ECON. J.* 1, 17 (1934); Wesley J. Yordon, *Evidence Against Diminishing Returns in Manufacturing and Comments on Short-Run Models of Price-Output Behavior*, 9 *J. POST KEYNESIAN ECON.* 593 (1987).

76. Franchise obligation is defined here as the minimal service requirement. See, e.g., Substantive Rules, Public Utility Commission of Texas, § 23.61—4, Sept. 12, 1988. Weisman, *supra* note 23, describes the implied contract of franchise obligation facing local telephone companies; see also Dennis L. Weisman, *Competitive Markets and Carriers of Last Resort*, *PUB. UTIL. FORT.*, Jul. 6, 1989, at 17.

decisions as reducing the price of subscriber access to attract more basic access subscribers who will have the option of using the existing facilities. Such a cost structure, in the face of increasing competition in the industry, will require new pricing approaches.<sup>77</sup>

Companies and regulators alike may need to reevaluate the franchise obligation itself. Kahn and Shew note that the appropriate costs are those that actually exist rather than those that might have existed for some hypothetical network.<sup>78</sup> Regardless, franchise obligation decisions will influence the forward-looking costs of new facility placement. Placing facilities to serve all customers in a timely manner requires construction in high-cost, long-route/long-loop, and low-density areas and the creation of substantial underutilized capacity. These high-cost operations argue strongly for revising the franchise obligation, though they may simply be unrealistic in the face of increased competitive pressures, or may at least create costs greater than their value.

### C. *Alternate Price Structures*

Alternate price structures for subscriber access service may be necessary eventually, or at least economically desirable. Kahn and Shew stress that costs that are not usage-sensitive should not be recovered by usage-sensitive prices. One alternate price structure would require customers' outright purchase of the portion of the loop closest to the customer, rather than the traditional leasing arrangement. Such fees are not new, but are not currently in widespread use. The section of the loop near the customer's premises,<sup>79</sup> which represents a significant portion of loop costs and the costs of the franchise obligation, could be sold, for example, directly to a real estate developer planning to build new houses, apartments, or businesses in a subdivision. Such arrangements would be consistent with commercial practices, since in unregulated markets customer-specific or geographic-specific assets are often purchased outright or provided through long-term contracts.<sup>80</sup>

Price structures for subscriber access services need to reflect the structure of subscriber costs.<sup>81</sup> These prices need to reflect the variation in loop costs that result from the distance of the loop and the density of customers in the

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77. See *supra* note 3.

78. See Kahn & Shew, *supra* note 1, at 213, 223-28.

79. This section of the loop is typically considered part of the distribution plant; in contrast to the feeder portion of the loop. Distribution facilities, by their very nature, tend to be relatively customer-specific and geographic-specific.

80. It is unlikely, for example, that one could find a company willing to pave a residential driveway, or install carpet in a bedroom, and lease the facilities without a contract to the homeowner. The costs of digging a well, laying a concrete foundation for a building, or doing the layout for a company brochure are other examples in which leasing without a long-term contract is unlikely.

81. Cf. WENDERS, *supra* note 2; Kahn, *supra* note 27; Kahn & Shew, *supra* note 1; William Taylor, *supra* note 20.

geographic area. The theoretical long-run notion of costs should not provide an artificial constraint to pricing services which use existing facilities whose capacity will not be exhausted during the time period of the pricing decision in question. In particular, one should encourage the use of customer-specific contracts in order to increase the utilization of the telephone network where it is underutilized. When placing new facilities in response to actual demand, the proper cost calculation for a customer-specific contract will yield a higher value than would theoretical long-run calculations. Also, lower values will result when existing facilities will not exhaust during the duration of the customer-specific contract; the economic costs caused by the contract will in fact be greater than or less than the theoretical long-run costs in these circumstances. One of the benefits of increased reliance on customer-specific contracts is the increased utilization of underutilized facilities—utilization is encouraged where economic costs are low and discouraged where economic costs are high.

### Conclusion

The costs of providing access to a network are not common costs to services using that network. Rather, such costs are best considered to be directly attributable to a network access service itself. This position has implications for policies on testing for cross-subsidies, unbundling services, franchise obligations, and establishing the level and structure of prices. One may apply the Kahn and Shew position on the costs of access to networks beyond the telecommunications industry. In the gas distribution, water distribution, cable TV, and electric power industries, facilities are placed to provide the customer with access to the relevant network. Apparently, at least a portion of the costs of placing and maintaining these facilities is not sensitive to usage but is specific to customers or geography. The Kahn and Shew position as expanded here is clearly relevant to efficient price structures in these industries.<sup>82</sup>

In the future, regulated companies and regulators alike will face the challenge of consistently applying the principles presented by Kahn and Shew. Over time, the divisions between previously distinct industries such as telecommunications, cable television, computer-based information systems, and even electric power, will continue to blur. The lessons from Kahn and Shew are likely to become both more important and more difficult to apply. Access to networks, facilities, data bases and other assets is likely to be a critical component for many policy issues as markets, firms, services and customer

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82. Electric power and gas distribution can be thought of as essentially single-service industries. However, business and public policies are often established as if several services were provided: residential, commercial, agricultural, large and small industrial. In addition, opportunities for other services may exist within the same network: remote meter-reading, demand-side management, interruptible contracts, or leasing of rights-of-way or other facilities.

demands evolve. The ideas presented here should make the principles of Kahn and Shew more apparent and ease their application.