

# Cross-Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing

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*A decade ago, Alfred Kahn challenged regulators to adopt more efficient telephone pricing policies. They have yet to respond and instead have maintained a system of inefficient cross-subsidies. While some argue that the current system promotes universal telephone service, a careful examination reveals that the cross-subsidies do not further that goal. Professors Kaserman and Mayo argue that regulators maintain the current system because they believe that its pattern of cross-subsidization benefits a politically influential class—local residential customers. Kaserman and Mayo contend, however, that the regulators are wrong: the benefits from the current cross-subsidies are so diffused that abolishing them will not ultimately affect individual customers.*

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## Introduction

In 1984, the same year as the AT&T divestiture, Alfred Kahn challenged regulators to adopt more efficient pricing policies in the telecommunications industry, thereby moving public policy down "the road to more intelligent telephone pricing."<sup>1</sup> A full decade later regulators have yet to respond substantially. The traditional inefficient pricing structure, containing pervasive cross-subsidization among customers, remains largely intact. In our view, regulators' reluctance to adopt more efficient pricing policies that reduce or eliminate these cross-subsidies stems from a perception that such policies would seriously antagonize important political constituencies. Their reluctance is not due to an inability to comprehend or a failure to appreciate the economic benefits such policies offer. To succeed, future efforts to persuade regulators to adopt more efficient policies must demonstrate that the political costs of more intelligent telephone pricing are not as great as regulators currently perceive them to be.

Kahn's basic proposal involves changing the existing structure of telephone rates to more closely reflect the marginal costs of providing the various services

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1. Alfred E. Kahn, *The Road to More Intelligent Telephone Pricing*, 1 YALE J. ON REG. 139 (1984). The policy recommendations made in Kahn's paper were not new. Kahn and others had been preaching the virtues of efficient pricing for years.

involved—namely customer access, long-distance usage, and local usage.<sup>2</sup> Kahn argues that efficient pricing requires a two-part tariff.<sup>3</sup> Such a tariff consists of a fixed charge to cover the non-traffic-sensitive costs of access and a variable charge to cover the traffic-sensitive costs of network usage. Each component of the tariff would reflect the marginal cost of the respective service. Adopting this sort of pricing structure would yield substantial benefits in the form of increased economic efficiency and more equitable rates. In addition, more efficient pricing would help cultivate the increasing competition now emerging in telecommunications markets.

The increasing intensity of competitive market forces in this industry will eventually necessitate the recommended pricing structure regardless of regulatory action or inaction because competition inevitably drives prices to marginal costs.<sup>4</sup> Until this occurs, however, society continues to bear the costs imposed by existing inefficient pricing policies. Consequently, Kahn argues that in the interim regulators should actively pursue more efficient, cost-based rates to reap the benefits such a policy offers. Economists have estimated that the efficiency losses caused by existing policies that keep long-distance rates above costs amount to \$1.5 to \$10 billion annually.<sup>5</sup> Moreover, these estimates are probably too low because they do not consider the incalculable losses resulting from the distortion of dynamic market incentives to create and adopt technological advances that make more efficient use of the long-distance network.<sup>6</sup>

Despite the compelling logic of Kahn's recommendations and the magnitude of the benefits at stake, the progress achieved toward efficient pricing has been disappointingly small to date. While there has been some perceptible movement down the road Kahn mapped so clearly a decade ago, the pace of change has been excruciatingly slow. Regulators have largely refused to implement the proposed policies.<sup>7</sup>

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2. *Id.* at 140.

3. *Id.* at 141.

4. *Id.* at 151.

5. See, e.g., James M. Griffin, *The Welfare Implications of Externalities and Price Elasticities for Telecommunications Pricing*, 64 REV. ECON. & STAT. 59, 65 (1982); John T. Wenders & Bruce L. Egan, *The Implications of Economic Efficiency for US Telecommunications Policy*, 10 TELEPHONE POL'Y 33 (1986).

6. Alfred Kahn and William Shew noted this several years ago:

Whatever the historic justification for the system of pricing still in effect today, it has long since disappeared. Its social cost today is to be reckoned not merely in terms of a multi-billion dollar annual static welfare loss, but, perhaps even more important, in the ways in which it has discouraged the exploitation of one of our most dynamic, versatile technologies.

Alfred E. Kahn & William B. Shew, *Current Issues in Telecommunications Regulation: Pricing*, 4 YALE J. ON REG. 191, 255-56 (1987).

7. The slow movement toward more efficient pricing policies has been paralleled by the pace of deregulation. Despite the 1984 divestiture, both long-distance and local telecommunications services remain largely regulated today. At the state level, public utility commissions regulate (to varying degrees) local rates, intrastate carrier access charges, and intrastate toll rates. At the federal level, the Federal Communications Commission regulates interstate carrier access charges, the interstate portion of end-user

Why have regulators been so hesitant to embrace the clear advantages of more efficient pricing policies? The answer to this question lies in the cross-subsidization mechanisms that characterize the current pricing structure. Regulators favor the existing pricing structure because they believe their political support is crucially dependent upon maintaining the subsidy flow it creates. This belief, which we feel is largely erroneous or at least exaggerated, is the principal roadblock to more intelligent telephone pricing.<sup>8</sup>

The existing system of cross-subsidies exhibits several undesirable properties. In this Article, we argue that regulators' adherence to a policy favoring such subsidies stems primarily from the low local telephone rates that result from them and the political support they provide rather than the more frequently heard argument that these subsidies support the social goal of universal service. It is our contention that, in fact, both beliefs are mistaken. Cross-subsidies do not promote universal service, and the political costs of removing them are not as great as some parties have led regulators to believe. Consequently, efforts to encourage regulators to abolish cross-subsidies and adopt more efficient pricing policies must do more than merely reemphasize the desirable efficiency properties of such actions; they must also correct the regulators' misperception that the political ramifications of more intelligent telephone pricing would be disastrous to their careers.

Part I of this Article describes the efficient pricing structure advocated by Kahn and the cost structure of the telecommunications industry and contrasts these with the pricing policies regulators currently employ. Part II explains the existing system of cross-subsidies that results from these pricing policies. Part III describes the patently undesirable properties of this system of cross-subsidies. Finally, Part IV argues that regulators' support for the inefficient pricing policies stems from misperceptions about the political support these policies generate and suggests that future arguments for reform address regulators' political concerns.

## I. Costs Versus Prices Under the Current System

One cannot understand the inefficiency of the current pricing system without first examining the structure of costs, the services provided, and the traditional pricing policies employed in the telecommunications industry. In this

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access charges, and the interstate toll rates of AT&T. This lethargic pace of deregulation has led one commentator to write that "[u]ndoubtedly, the greatest surprise in telephone industry deregulation has been the absence of deregulation, for the industry continues to be almost as highly regulated today as twenty years ago." Robert W. Crandall, *Surprises from Telephone Deregulation and the Divestiture*, 78 AM. ECON. REV. 323, 323-27 (1988); see also David L. Kaserman & John W. Mayo, *Long Distance Telecommunications Policy: Rationality on Hold*, 122 PUB. UTIL. FORT. 18 (1988).

8. Attempts to preserve cross-subsidies have also slowed the pace of deregulation in other industries. Theodore E. Keeler, *Theories of Regulation and the Deregulation Movement*, 44 PUB. CHOICE 103 (1984).

part, we describe these basic features of the industry and explain how traditional pricing policies used to set telephone rates conflict with efficient pricing principles.<sup>9</sup>

#### A. *Efficiency in Pricing*

An economically efficient allocation of resources exists if, under a given set of preferences and income distribution, it is impossible to find an alternative allocation that will make one or more individuals better off without making some other individuals worse off.<sup>10</sup> Consequently, if there is an inefficient allocation of resources, it is possible to improve the lot of some without injuring others. An efficient pricing system usually exists when the price of a good or service is equal to the marginal cost of producing it.<sup>11</sup>

The general efficiency of marginal cost pricing stems from the important role that prices play in directing the consumption and production decisions of individuals and firms in a market economy. The price consumers are willing to pay for a unit of good X indicates the marginal value (or opportunity cost) of other goods they give up to obtain a unit of X. The price of the last unit of X purchased in the market indicates society's marginal willingness to pay for that unit. Similarly, the marginal cost of a unit of X is the marginal value of the goods society forgoes producing to manufacture the marginal unit of X. When price is equal to marginal cost, society's marginal willingness to pay for the last unit of X is equal to the marginal opportunity cost of producing that unit. This equality is necessary to maximize the total value to society from consumption and production of a good.

#### B. *The Cost Structure of the Telecommunications Industry*

The costs of providing telecommunications services fall into two broad categories—fixed costs that do not vary with the volume of calling and variable costs that do vary with volume. What distinguishes telecommunications from most other industries is the relative magnitude of fixed costs. For local ex-

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9. The analysis that follows sums up much that one can find in greater detail elsewhere. See, e.g., GERALD BROCK, *THE TELECOMMUNICATIONS INDUSTRY* (1981); LESTER D. TAYLOR, *TELECOMMUNICATIONS DEMAND: A SURVEY AND CRITIQUE* (1980); JOHN T. WENDERS, *THE ECONOMICS OF TELECOMMUNICATIONS: THEORY AND POLICY* (1987); Griffin, *supra* note 5; Kahn, *supra* note 1; Bridger M. Mitchell, *Optimal Pricing of Local Telephone Service*, 68 *AM. ECON. REV.* 517 (1978).

10. See EDGAR K. BROWNING & JACQUELENE M. BROWNING, *MICROECONOMIC THEORY AND APPLICATIONS* 510-11 (1st ed. 1983).

11. Kahn, *supra* note 1, at 140. The two principal exceptions to the efficiency of marginal cost pricing involve public goods and externalities. See BROWNING & BROWNING, *supra* note 10, at 657-75. For a specific discussion of such exceptions in the telecommunications industry, see WENDERS, *supra* note 9, at 22-33.

change companies, such costs account for a large percentage of the typical firm's total costs.<sup>12</sup>

Fixed costs result primarily from providing customer access to both the local and long-distance networks. These costs represent the assets comprising the local exchange that connect the customer's telephone to the local end office, such as wires, poles, and switching equipment. These assets provide the customer the opportunity to place and receive telephone calls—they provide a dial tone.

Variable costs vary directly with the volume of traffic on the network. These costs include, *inter alia*, expenditures to operate switches and carry signals as well as a small portion of billing and collection expenses. Moreover, a share of the capacity costs of the system also varies with usage, especially at periods of peak demand, because the networks must provide a certain level of reliability.

Any efficient telephone pricing system must take into account two important and incontrovertible facts about fixed network costs. First, fixed costs, by definition, bear no relationship to the volume of usage; they would remain constant even if no one ever placed a call. Consequently, the fundamental principle of efficient pricing—cost causation—requires that the per-unit price of telephone usage be independent of fixed costs. It is inefficient to assign any fixed costs whatsoever to the per-minute price of telephone usage. Doing so raises the price of usage above marginal cost, thereby pushing usage below the efficient level.

Second, the assets that make up the bulk of the fixed costs must be in place to complete either local or long-distance telephone calls. Although the local exchange companies have owned these assets since divestiture, fixed costs are actually common costs that cannot be causally attributed to the usage of either type of service.<sup>13</sup> Any attempt to do so will result in economically inefficient prices, regardless of the apparent logic or fairness of the allocation methodology.

These two facts require that an efficient pricing system recover fixed costs through a fixed end-user access charge for providing customer access to the network. This charge should cover the cost of constructing and maintaining the fixed assets of the local network. Such a charge is consistent with the principle of cost causation because it is the customer's decision to subscribe to telephone service rather than the decision to use that service that necessitates the construction and maintenance of fixed assets.

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12. See Kahn, *infra* note 1, at 141. Attempts by various parties to convince state regulatory commissions that a substantial portion of these fixed costs do vary with usage are largely specious. See *supra* notes 40-50 and accompanying text.

13. For a definition of common costs, see 1 ALFRED E. KAHN, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS* 77-83 (1970).

The variable costs of both local and long-distance service consist of the costs of transmitting and switching calls over the respective networks. These costs may be relatively small on a per-unit basis, particularly for local service. They are not zero, however, especially for usage at peak periods. An efficient pricing system should recover these costs through usage-based prices that reflect the marginal costs of providing the service if the incremental costs of metering usage are less than the efficiency gains generated by such prices.<sup>14</sup> If marginal cost is sufficiently close to zero or if the incremental costs of metering local usage are sufficiently large, a usage-based local rate structure (commonly known as local measured service) is inefficient. The currently predominant practice of charging a flat monthly rate for local service would then be entirely appropriate.

In practice, however, flat monthly rates for local service are unlikely to be efficient. Recent technological advances, primarily the installation of stored program control in electronic central offices, have made it possible for local exchanges to meter usage at greatly reduced costs.<sup>15</sup> Continuing to price marginal consumption of local service at zero by using a flat monthly rate creates substantial efficiency losses easily amounting to millions of dollars.<sup>16</sup> The price of local service should therefore reflect the variable costs of using the local network to place calls on a minutes-of-use basis.<sup>17</sup> The cost of using the long-distance network is already priced on that basis, though the prices currently charged exceed marginal cost by at least a wide margin<sup>18</sup> due to the allocation of fixed costs to this service.

Efficient (and intelligent) telephone pricing therefore requires a two-part tariff. A fixed monthly charge, independent of usage, should recover the fixed costs of providing customer access to the network. A usage-based charge for both local and long-distance services equal to the marginal costs of the respective services would recover usage sensitive costs.<sup>19</sup> Under this system, it

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14. If the costs of metering, a requirement for usage sensitive pricing, are high relative to the unmetered cost of providing local telephone usage, then pricing such usage on a flat-rate basis can be economically efficient. See John T. Wenders, *Two Views of Applied Welfare Analysis: The Case of Local Telephone Service Pricing*, 57 S. ECON. J. 340, 346 (1990); see also BRIDGER M. MITCHELL & INGO VOGELSANG, TELECOMMUNICATIONS PRICING: THEORY AND PRACTICE 255 (1991) (citing study by Park and Mitchell); James Griffen & Thomas Mayor, *The Welfare Gain from Efficient Pricing of Local Telephone Service*, 30 J.L. & ECON. 455, 465-88 (1987); Kahn & Shew, *supra* note 6, at 235-39.

15. With stored program control, all messages (including local) are routed through computers that contain software capable of recording both call duration and time of day. As a result, the costs of metering local usage have been reduced significantly by adoption of this new technology.

16. See Carlos Martins-Filho & John W. Mayo, *Demand and Pricing of Telephone Services: Evidence and Welfare Implications*, 24 RAND J. ECON. 439, 451 (1993).

17. For empirical evidence on the welfare gains from usage-based pricing, see Griffen & Mayor, *supra* note 14, at 480; MITCHELL & VOGELSANG, *supra* note 14, at 255 (citing study by Park and Mitchell).

18. Kahn, *supra* note 1, at 141-42.

19. *Id.* at 141. The two-part tariff (or nonlinear pricing in general) is efficient in situations where (a) both fixed costs and variable costs are present, and (b) marginal costs are below average costs. See Robert D. Willig, *Pareto-Superior Nonlinear Outlay Schedules*, 9 BELL J. ECON. 56 (1978) (discussing the two-part tariff).

would be unnecessary to allocate fixed costs to either long-distance or local usage. All customers would directly pay the fixed costs caused by their decision to subscribe to telephone service through the fixed component of the two-part tariff. Adopting such a pricing structure would be a significant movement along the policy path Kahn so highly recommended.

### C. *Traditional Pricing Policies: Smoke and Mirrors*

When economists first encounter pricing policies in the telecommunications industry, they get the uncomfortable feeling of having passed through the looking glass. They encounter foreign concepts with no apparent foundation in economic theory. Moreover, widespread reliance on these concepts makes it difficult to assess the merits of various regulatory decisions. Specifically, four erroneous concepts characterize regulatory rate-setting practices: (1) pricing on the basis of fully-distributed costs; (2) value-of-service pricing; (3) flat-rate pricing for local service; and (4) rate averaging.<sup>20</sup>

#### 1. *Fully-Distributed Cost Pricing*

Regulators have traditionally based telephone prices on fully distributed costs.<sup>21</sup> This practice involves assigning the costs of the regulated firm to various services on the basis of some criterion other than the marginal costs of providing those services. Use of this practice has involved, inter alia, allocation of the large common costs of providing customer access to long-distance usage. Historically, such allocations occurred through the separations and settlements process under which network costs were first separated and assigned to the local and long-distance services.<sup>22</sup> The resulting revenues were then settled or divided between the various Bell Operating Companies and independent local telephone companies.<sup>23</sup>

Under this system, the rate structure depends entirely upon the criteria used to allocate costs. These criteria have traditionally borne no relation to marginal costs. Before the AT&T divestiture, regulators allocated an increasing share of the fixed costs of the network to the usage-sensitive price of long-distance

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20. As we shall see, all of the concepts discussed in this section are selectively applied in pricing telecommunications services. Apparently, none of the pricing concepts discussed here is viewed as a general principle that should apply to all pricing decisions.

21. Our discussion of this pricing approach is necessarily brief. For more complete exposure, see 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; Ronald R. Braeutigam, *An Analysis of Fully Distributed Cost Pricing in Regulated Industries*, 11 BELL J. ECON. (1980); George Sweeney, *Welfare Implications of Fully Distributed Cost Pricing Applied to Partially Regulated Firms*, 13 BELL J. ECON. 525 (1982).

22. For long-distance services, costs were separated and assigned to the intrastate and interstate jurisdictions as well.

23. See WENDERS, *supra* note 9, at 3.



service.<sup>24</sup> This process has continued since the divestiture through the carrier access charge system implemented in 1984. Under this system, local exchange carriers recover a significant portion of their fixed costs from carrier access charges long-distance firms pay. The long-distance company must pay a fee to the local exchange company for every minute of usage on both the originating and terminating ends of the call. These access charges currently account for roughly fifty percent of the costs of providing long-distance service.<sup>25</sup>

Despite considerable variation among different states and a general decline in recent years, all of these access charges exceed local exchange companies' marginal costs of providing access because regulators invariably allocate a large portion of fixed costs to long-distance usage.<sup>26</sup> Regulators usually justify this allocation by observing that long-distance customers benefit from the presence of the local network and consequently should bear some of the costs associated with it. This argument rests on the erroneous assumption that there exists a group of long-distance consumers who would somehow escape paying for the fixed costs of the local network if long-distance services were priced at marginal cost.

Under an efficient pricing system, all customers, including those who use only long-distance services, would pay a fixed end-user access charge to cover the costs of fixed assets. Whether these assets benefit customers who place or receive a long-distance call is immaterial. The cost of long-distance usage should be the only factor that governs the decision to use the long-distance network. By definition, these usage costs do not include any fixed costs. Thus, fully-distributed cost pricing is economically indefensible. It results in long-distance prices that exceed marginal costs and thereby suppresses long-distance use below the efficient level.<sup>27</sup>

## 2. Value-of-Service Pricing

Value-of-service pricing attempts to charge customers who value a particular telephone service more highly than other customers a higher price for that service, even if the costs of providing the service are the same for all

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24. See Peter Temin, *Cross Subsidies in the Telephone Network after Divestiture*, 2 J. REG. ECON. 349 (1990) (providing a more complete accounting of the evolution of cost allocations under this system).

25. See David L. Kaserman et al., *Open Entry and Local Telephone Rates: The Economics of IntraLATA Toll Competition 6* (Sept. 1993) (unpublished manuscript, on file with authors). These charges currently average approximately 12¢ per minute. *Id.*

26. David L. Kaserman & John W. Mayo, *Long Distance Telecommunications: Expectations and Realizations in the Post-Divestiture Period*, in *INCENTIVE REGULATION FOR PUBLIC UTILITIES* (Michael A. Crew ed., forthcoming Oct. 1994).

27. The artificially high prices of long-distance services that result from this system have other potentially serious efficiency consequences in the long run: they encourage uneconomic bypass of the public switched network and retard technological advances in the utilization of long-distance services.

customers. In practice, regulators use value-of-service pricing to justify charging business customers higher rates for local service than residential customers.<sup>28</sup>

Value-of-service pricing is a form of price discrimination because the resulting rates differ from marginal costs by unequal percentages. While some types of price discrimination, such as Ramsey pricing,<sup>29</sup> are efficient under certain conditions, there is no reason to believe that value-of-service pricing produces efficient telephone rates. More importantly, value-of-service pricing fails to satisfy the principle of cost causation because the prices charged under this system do not equal marginal costs. A single-line business customer using local service, for example, may not impose greater costs on the network than a typical residential customer, but the business customer may pay up to four times as much for local service as residential customers.<sup>30</sup>

One fallacy implicit in value-of-service pricing is that businesses will not ultimately recover at least a portion of these increased prices from their customers. In reality, higher telephone rates will increase the costs of doing business and raise the market-clearing prices businesses charge their customers. Regulators cannot, however, know the extent to which these customers will bear the costs of higher telephone prices a priori because this will depend upon factors such as the share of a product's costs for which telephone service inputs account and the elasticity of demand for different products. Consequently, the burden of the tax will fall arbitrarily on different consumer groups, creating further economic inefficiencies.

A second fallacy involved in value-of-service pricing is that equity considerations require regulators to consider explicitly the value of a service to different customer groups. This notion conflicts with the principle of cost-causation, and thus with efficient pricing principles as well, because there is no relation between the value an individual customer places on a service and the cost of producing it. Indeed, if it were true as a general proposition that prices should reflect consumer valuations rather than producer costs, it would be necessary to proscribe competitive markets because competition drives prices to marginal costs regardless of the value non-marginal customers receive from

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28. For a recent discussion of pricing and cross-subsidization between business and residential telephone customers, see Karen Palmer, *A Test for Cross Subsidies in Local Telephone Rates: Do Business Customers Subsidize Residential Customers?*, 23 RAND J. ECON. 415 (1992).

29. Ramsey pricing involves pricing a multiproduct regulated firm's services at prices that depart from marginal costs in inverse relation to the elasticities of demand for those services. See F.P. Ramsey, *A Contribution to the Theory of Taxation*, 37 ECON. J. 47 (1927); see also William J. Baumol & David F. Bradford, *Optimal Departures from Marginal Cost Pricing*, 60 AM. ECON. REV. 265 (1970). Ramsey prices are only efficient in a limited second-best sense—that is, relative to a set of non-discriminatory uniform prices. Once we allow for the possibility of nonlinear pricing (a two-part tariff), Ramsey prices are no longer efficient. See Willig, *supra* note 19, at 61.

30. NATIONAL ASS'N OF REG. UTIL. COMMISSIONERS, BELL OPERATING COMPANIES EXCHANGE SERVICE TELEPHONE RATES (1991) (comparing business and residential rates).

their purchases.<sup>31</sup> We suspect that even most value-of-service pricing advocates would not favor elimination of competitive markets as a general policy prescription (although we also suspect that some might).

### 3. *Flat-Rate Pricing of Local Service*

For many years, most local telephone companies have charged customers a fixed, monthly rate independent of usage.<sup>32</sup> This practice creates a tying arrangement between customer access and local usage by pricing the two services as a bundle.<sup>33</sup> Two distinct problems characterize this system: one involves the rate structure and the other the rate level. First, the rate structure effectively prices usage at zero. Thus, consumers receive false signals about the social costs of their usage. These erroneous signals, in turn, encourage socially excessive usage of the local network, especially at peak periods. A second problem is that regulators have typically set local flat rates at levels that fail to cover the costs of the access/local usage bundle. As a result, local telephone exchanges have required a subsidy from long-distance markets to cover the costs of constructing, maintaining, and operating the local networks.

Regulators have tried to justify this scheme by arguing that revenues can only be obtained from two basic categories of telephone services—local and long-distance. Under this view, consumers value customer access only for the calls it enables them to make rather than as a separate service. Therefore, regulators view it as inappropriate to charge a separate, fixed fee for access, as efficient pricing requires. As a result, regulators must load access costs onto the only remaining revenue sources—the prices of local and long-distance services.

This reasoning exhibits two flaws. First, customer access provides the opportunity to both place and receive calls. Consequently, customers may demand access even if they place no calls. Second, efficient pricing principles require telephone companies to recover costs in the manner they incur them, whether or not they can identify such costs with a separate product or service.

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31. At the aggregate level, consumer valuations influence the overall demand for a product. Demand, in turn, affects price by influencing the total amount produced and thus the marginal costs of production. Prices in competitive markets, however, do not generally reflect differences in valuations between individual customers.

32. Figures reported in NAT'L ASSOCIATION OF REG. UTIL. COMMISSIONERS, *supra* note 30, at 12-15, indicate that approximately 75% of residential customers and 50% of business customers in the United States pay a flat rate for local service.

33. A tying arrangement exists when the seller of one product (here, access) requires that its customers also purchase another product (local service) from it, and the two products are priced jointly as a bundle. See ROGER D. BLAIR & DAVID L. KASERMAN, *ANTITRUST ECONOMICS* 381 (1985).

It is therefore possible to reach firm conclusions about efficient pricing policies without resolving esoteric debates about whether access is a separate service.<sup>34</sup>

#### 4. *Rate Averaging*

A fourth erroneous concept regulators use is rate averaging. This concept requires all consumers of a given service to pay the same price for that service, even if the costs of providing it differ. Regulators use this concept to justify charging rural and urban customers the same price for the access/local service bundle although it is less expensive to provide that service to customers in densely populated urban areas than to those in rural areas.

To our knowledge, no one has ever attempted to reconcile rate averaging with value-of-service pricing, which results in customers paying different prices for the same service though the costs of serving the customers are the same. Such an attempt would be difficult at best. Both concepts entail a form of price discrimination, differing only by which factor varies among customers. Value-of-service pricing allows prices to differ though costs remain the same while rate averaging allows costs to differ though prices remain the same. Such a logical inconsistency is not uncommon in utility pricing; regulators seldom question why some consumers pay different rates though costs are the same while others pay the same rates though costs are different. Regulators attempt to justify the former through value-of-service pricing and the latter through rate averaging. The resulting prices diverge from marginal costs in either case; hence, neither concept is compatible with efficient pricing principles.

It would also be difficult to reconcile either concept with the traditional legislative mandate that regulatory commissions set just, reasonable, and nondiscriminatory rates. While legislatures generally do not define "nondiscriminatory" in any detail,<sup>35</sup> it is patently clear that rates based upon either value-of-service or rate averaging concepts are discriminatory in the economic sense because they do not correspond to the costs of supplying service to different customers.<sup>36</sup> It is clear, however, that both practices are economically inefficient and inconsistent with the principle of cost causation.

Thus, regulators superficially justify current telecommunications pricing policies with concepts that are fundamentally fallacious. What appear to be widely-accepted principles of utility rate making are in fact only thinly-veiled justifications for inefficient, non-cost-based rate structures.

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34. See William E. Taylor, *Efficient Pricing of Telecommunications Services: The State of the Debate*, 8 REV. INDUS. ORGS. 21, 27 (1993).

35. Most legislation that creates regulatory commissions contains broad and often vague language. For an economic explanation of such legislative ambiguities see Matthew D. McCubbins et al., *Administrative Procedures as Instruments of Political Control*, 3 LAW, ECON. & ORG. 243 (1987).

36. For a definition of price discrimination, see FREDERICK M. SCHERER & DAVID ROSS, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* 489 (3d ed. 1990).

## II. Existing Cross-Subsidies

Cross-subsidization among customers is a prevalent, if not ubiquitous, characteristic of virtually all regulatory rate structures.<sup>37</sup> Substantial cross-subsidies exist in telecommunications because the selective application of the flawed pricing concepts discussed above yields rates that depart significantly from the costs of providing the various services. The complexity of the price structure and the many ways rates and costs diverge result in a number of overlapping and criss-crossing subsidy flows. The following sections attempt to unravel these flows.

### A. *The Complex Web of Subsidy Flows*

Current rate-making practices create at least four major subsidy flows. First, while per unit access charge rates have fallen since the AT&T divestiture, the expanded volume of long distance calling has resulted in access charge payments to local exchange companies of nearly \$20 billion today.<sup>38</sup> Second, business customers subsidize residential customers as a result of value-of-service pricing of local telephone service.<sup>39</sup> Third, the bundling of access and local usage under a single flat rate with no usage fee forces light users of local service to subsidize heavy users of that service. Fourth, rate averaging creates a subsidy from urban to rural telephone customers.

The varied and often conflicting nature of these cross-subsidies frequently makes it difficult to determine who actually subsidizes whom. Does a small business owner in a rural area with relatively heavy usage of the local network pay or receive a net subsidy? Does a rural residential customer with heavy usage of long-distance service pay or receive a net subsidy? The answers are not immediately apparent: one needs specific information on calling patterns to determine the net effect of the various cross-subsidies on a given individual.

Without more specific information, one can only make definitive statements about the overall direction of subsidy flows for two groups. Residential customers who live in rural areas and are heavy users of the local network with no long-distance usage definitely receive a subsidy. Similarly, business customers in urban areas that place many long-distance calls and have

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37. See generally Richard A. Posner, *Taxation by Regulation*, 2 BELL J. ECON. & MGMT. SCI. 22 (1971) (noting frequency of cross-subsidies in regulation).

38. See FEDERAL COMMUNICATIONS COMMISSION, STATISTICS OF COMMUNICATIONS COMMON CARRIERS 39 (1991/1992 ed. 1993). Because local exchange companies do incur some marginal costs associated with the provision of carrier access, the subsidy flow, though large, is less than the full amount of revenue transferred. We address arguments that this subsidy flow does not exist below. See *infra* text accompanying notes 40-50.

39. Recent tests for the presence of this cross-subsidy confirm its existence. See Palmer, *supra* note 28, at 430.

little use of the local service definitely pay a subsidy. Most customers do not fit in either category; they both pay and receive subsidies. The net effect of this complex system on their telephone bills is thus indeterminate a priori.

Despite this indeterminacy with respect to individual consumers, these subsidy flows do systematically affect consumer groups as a whole. The bulk of subsidies in this industry flow from business to residential customers. Three of the four subsidies identified above flow in this direction because business customers are relatively heavy users of long-distance services, tend to be located in urban areas, and pay relatively higher local rates. Consequently, local residential service is the primary beneficiary of these cross-subsidies.

In addition, the very complexity of this system with its resulting uncertainty has some value to the regulator. If one robs Peter to pay Paul, he is likely to be better off if Peter does not even know that he has been robbed and if Paul is unaware of the source of his good fortune.

#### B. *Does the Long-Distance to Local Cross-Subsidy Exist and Does It Matter?*

Economists have long maintained that the historic practice of allocating the fixed costs of the network to the long-distance market has resulted in a significant cross-subsidization of the access/local service bundle, resulting in local flat rates that fall far short of the costs of providing the combined services. Several commentators now argue, however, that typical local telephone rates are sufficient to cover the marginal cost of that service, including the marginal cost of customer access. If the price of the local service/access bundle equals or exceeds its marginal cost, then under Faulhaber's widely-accepted definition of a cross-subsidy, it is not receiving a subsidy.<sup>40</sup>

Proponents of this contention make two different arguments. The first argument, which has surfaced in regulatory hearings in a number of states, claims that no subsidization exists when long-distance services bear their alleged fair share of the fixed costs of the local exchange because the marginal costs of local service, including access, are below the rates charged. This finding of no cross-subsidization, however, is the result of a fully distributed cost shell game. Regulators make the cross-subsidies disappear by allocating a substantial portion of fixed network costs away from the local service/access bundle to long-distance service. Such allocation lowers the apparent magnitude of the access/local service bundle's costs to the regulated price while pushing up the perceived cost of long-distance service to its regulated price. As a result

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40. Under the Faulhaber criteria, a service is receiving a subsidy only if the price of that service falls below its marginal cost. Conversely, a service is paying a subsidy only if its price exceeds its stand-alone costs (the costs of providing the service by itself, without combining its production with that of other services). See Gerald R. Faulhaber, *Cross-Subsidization: Pricing in Public Enterprises*, 65 AM. ECON. REV. 966 (1975).

of such gerrymandering of costs, the cross-subsidy seems to disappear. Such demonstrations are simply the result of economically unwarranted cost allocations. The entire exercise is a sham because the true marginal costs of long-distance and local service contain no fixed costs. Relying on the completely discredited concept of fully-distributed costs, we can dismiss this line of reasoning because it lacks any logical foundation.<sup>41</sup>

The second argument denying the existence of a long-distance to local cross-subsidy is more complex. It addresses issues of efficient system design, regulatory accounting practices, legal rules governing the right to recover past investments, and the causal relationships that might exist between usage of various services and the level of costs currently categorized as fixed. Most recently, an article by David Gabel and Mark Kennet has renewed a debate on this subject that has included Alfred Kahn, Lester Taylor, and William Taylor.<sup>42</sup> Gabel and Kennet argue that a two-part tariff, as recommended by Kahn and others, will not necessarily improve overall economic efficiency substantially. Their argument also implies that the long-distance to local service cross-subsidy is illusory.

Gabel and Kennet's argument rests primarily upon two issues of fact.<sup>43</sup> First, they claim that technological change—specifically conversion of the telecommunications network from analog to digital—makes customer access costs increasingly usage sensitive.<sup>44</sup> They argue that, as a result, the current practice of recovering these costs through usage-sensitive charges placed on long-distance service, rather than through a fixed end-user access fee, is not economically inefficient.

Gabel and Kennet also claim that prior estimates grossly overstate the efficiency gains from a two-part tariff by using upwardly biased estimates of the price elasticity of demand for long-distance service.<sup>45</sup> This claim is supported only by their own reinterpretation of Lester Taylor's widely-cited book on this subject.<sup>46</sup> They do not base their claim upon any new data or empirical work of their own.

A review of Gabel and Kennet's article and the responses to it leads us to conclude that their argument against adoption of a two-part tariff is woefully

41. Kahn, *supra* note 1, at 142-43, disposes of these arguments quite convincingly. See also WENDERS, *supra* note 9, at 173-77.

42. See David Gabel & Mark D. Kennet, *Pricing of Telecommunications Services*, 8 REV. INDUS. ORG. 1 (1993); Lester Taylor, *Pricing of Telecommunications Services: Comment on Gabel and Kennet*, 8 REV. INDUS. ORG. 15 (1993); Taylor, *supra* note 34, at 21-38; Alfred E. Kahn, *Pricing of Telecommunications Services: A Comment*, 8 REV. INDUS. ORG. 39 (1993); David Gabel & Mark D. Kennet, *Pricing of Telecommunications Services: A Reply to Comments*, 8 REV. INDUS. ORG. 43 (1993).

43. The debate also involves certain theoretical issues that we do not explore here. In our opinion, however, these issues are reasonably well-settled in favor of the two-part tariff.

44. Gabel & Kennet, *supra* note 42, at 2-3.

45. *Id.* at 8-11.

46. TAYLOR, *supra* note 9, at 168-74.

weak on both theoretical and empirical grounds. While it is plausible that technological changes have made a greater portion of access costs usage sensitive than economists had previously believed, it is implausible that all such costs are now variable. A significant share of the total costs of access remain fixed, and recovering these fixed costs by increasing the price of usage above its marginal cost is inherently inefficient. Furthermore, to the extent that use of the local network is responsible for the portion of access costs that have become variable, allocating these costs to long-distance service is also inefficient. Thus, the mere observation that some percentage of access costs are variable or that this percentage has increased is not a sufficient basis from which to conclude that the current pricing structure is efficient or that significant subsidization does not exist.

Two points regarding Gabel and Kennet's claims about price elasticity are worth noting. First, Lester Taylor's review of his own work and subsequent empirical studies led him to conclude that "Gabel and Kennet are wrong in their contention that the toll price elasticities used by Kahn and Shew and others in assessing the welfare costs of present telecommunications pricing policies are seriously overstated."<sup>47</sup> Given this conclusion, prior estimates of efficiency losses do not appear to have suffered any upward bias due to this source. Second, as noted above, these estimates exclude potentially more substantial losses from the distortion of dynamic incentives to create and adopt innovative uses of the long-distance network. Consequently, any bias in efficiency loss estimates is probably downward. Thus, Gabel and Kennet's argument, that perceived flaws in previous estimates of the efficiency losses warrant retaining the existing inefficient pricing structure, is entirely unconvincing; the current pricing policy is economically inefficient and does contain substantial elements of cross-subsidization.

The behavior of both consumers and producers in the marketplace also supports this conclusion. Telephone consumers certainly behave as though the subsidy exists. The recent trend for heavy users of long-distance services to bypass the local switched network provides indirect evidence that the price of these services well exceeds cost. Bypass occurs when a customer obtains a direct connection to the long-distance network. By circumventing the local exchange company's switches, the long-distance carrier does not pay the access charge that generates the subsidy flow. Customers bypass the local exchange either by purchasing special access services from the long-distance carrier (service bypass) or by constructing a private connection to the long-distance network (facility bypass). Where bypass occurs, the price of long-distance service routed through the local network must exceed the stand-alone costs of that service, or it would not be profitable to provide the bypass facilities. If

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47. Taylor, *supra* note 42, at 18.



price exceeds stand-alone costs, there is no question that long-distance customers are paying a subsidy.<sup>48</sup>

The behavior of telecommunications suppliers also supports the conclusion that the subsidy exists. Firms have an incentive to enter profitable markets; they have no such incentive to enter unprofitable ones. Firms are thus likely to enter markets where a subsidy keeps price above cost if they can avoid paying the subsidy. Conversely, firms are unlikely to enter markets in which regulators keep prices below cost, making up for the resulting loss with a subsidy.

The past twenty years have witnessed continual and increasing pressure on regulators and courts to allow entry into the long-distance market. Only recently have they felt pressure to permit entry into the local service market.<sup>49</sup> We do not claim that the long-distance to local service subsidy is entirely, or even primarily, responsible for this observed pattern of entry; however, such a subsidy clearly can create incentives for entry into the long-distance market.<sup>50</sup> This pattern is therefore consistent with the presence of a long-distance to local subsidy.

The question of whether or not this subsidy exists, however, is not as important as the relevance of this question to the issue of efficient pricing. The Faulhaber criteria for subsidy-free prices defines a wide range between marginal cost and stand-alone cost, particularly if large common costs are present. Within this range, prices may be efficient or inefficient even if no subsidy exists. Thus, a subsidy is a sufficient condition for inefficient prices, but it is certainly not a necessary one. Consequently, the whole debate regarding the existence and magnitude of the cross-subsidy is only tangentially relevant to the issue of efficient pricing.

To some extent, the argument over whether a subsidy exists is semantic. The answer hinges upon one's definition of a subsidy and how one would measure the costs of the services involved. Regardless of the position one adopts, however, there is no economic justification for a system that places the burden of fixed network costs on usage-sensitive prices. Such a system is inefficient whether or not a subsidy results. Consequently, one need not become mired in the subsidy debate to make definite statements about efficient pricing policies. We will continue to use the cross-subsidization terminology throughout the remainder of this Article because it is convenient to characterize the

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48. See *supra* note 40.

49. See Paul W. MacAvoy and Kenneth Robinson, *Winning by Losing: The AT&T Settlement and Its Impact on Telecommunications*, 1 YALE J. ON REG. 1 (1983), for a brief history of the regulatory and judicial decisions that led to the current open-entry policies in the long-distance market. Metropolitan fiber networks (alternative local transporters) have recently begun to seek entry into the local service market. This entry may be the result of the subsidies from business to residential customers and from urban to rural customers described above.

50. For an argument that the observed entry into long distance is due primarily to the regulatory umbrella under which new firms may profitably operate, see *id.* at 31.

overpricing of one service along with the underpricing of another as a cross-subsidy whether or not these prices fall outside the range that the Faulhaber criteria define. What is more, we are convinced that such cross-subsidization exists, is substantial, and is an accurate description of the existing price structure in this industry.

### III. Properties of the Current System

From the standpoint of efficiency, arguably the economic formalization of the public interest,<sup>51</sup> the current pricing system has little, if anything, to recommend it. A close examination, however, reveals that it also fails to serve the other primary goals regulators ostensibly pursue, such as equity and universal service.<sup>52</sup> In fact, the current pricing system exhibits at least four undesirable properties: (1) it is economically inefficient, (2) it is increasingly impractical, (3) it is often inequitable, and (4) it does not promote universal service.

#### A. *The Current System is Inefficient*

The current system encourages inefficient usage of both long-distance and local service. It dissuades consumers from making long-distance calls with a value that exceeds their costs by increasing the price of long-distance usage above marginal costs. Similarly, it fosters excessive usage of the local network by pricing local usage at zero.<sup>53</sup> In short, the current system is inefficient because it detaches prices from marginal costs.

The cost of maintaining this arcane system of overlapping and sometimes offsetting subsidies is high. Economists have estimated that the long-distance to local service subsidy alone costs society from \$1.5 to \$10 billion annually.<sup>54</sup> These figures likely underestimate the total costs of this policy because they

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51. See RICHARD SCHMALENSEE, *THE CONTROL OF NATURAL MONOPOLIES* 11-22 (1979).

52. The Communications Act of 1934 states in part that a goal of telecommunications policy is "to make available . . . to all people of the United States a rapid, efficient, nationwide, and world-wide wire and radio communication service with adequate facilities at reasonable charges." Communications Act of 1934, ch. 652, 48 Stat. 1064, 1064 (1934) (codified as amended at 47 U.S.C. § 151 (1937)). The lineage of the universal service goal, however, traces to the early 1900s when Theodore Vail, then Chairman of AT&T, announced a policy of "One Policy, One System, Universal Service." See GERALD FAULHABER, *TELECOMMUNICATIONS IN TURMOIL: TECHNOLOGY AND PUBLIC POLICY* 6 (1987).

53. This is especially true where the excess demand for local usage occurs at peak periods. To meet acceptable quality standards (such as blocking rates), local exchange companies must engineer their networks to accommodate peak-period demand. Thus, the incremental cost, including both capital and usage, of peak-period demand exceeds the marginal price (zero under flat-rate pricing) of additional local calling by a considerable amount. For estimates of the magnitude of these costs and how they vary by time of day, see Griffen & Mayor, *supra* note 14, at 471. Moreover, while these costs appear small (roughly \$.03 per minute during peak periods), the losses caused by pricing marginal consumption of minutes at zero can easily amount to millions of dollars. See Martins-Filho & Mayo, *supra* note 16, at 448-51.

54. See, e.g., Griffen, *supra* note 5, at 64.

account only for static inefficiencies; that is, they are based on existing demand and production technology. The artificial elevation of long-distance prices above marginal costs, however, discourages the design and adoption of innovative new technologies that employ the long-distance network. For example, this tax on long-distance services discourages the demand for and development of interactive distance-learning and long-distance medical imaging technologies.<sup>55</sup> These static estimates do not include the opportunity costs arising from such newborn or unborn innovations. Though there are obvious problems with measuring these costs, the total costs of the dynamic distortion of the innovation process may well exceed the losses from static inefficiencies. Consequently, regulators should not view recommendations to adopt more efficient pricing policies as mere calls to satisfy the esoteric whims of economic experts but rather as serious appeals to serve the interests of their constituents.

### *B. The Current System Is Increasingly Impractical*

It will prove difficult to sustain the current system of cross-subsidization in the increasingly competitive environment of telecommunications. Competition inexorably drives prices to marginal costs.<sup>56</sup> Moreover, recent advances in transmission and switching technology allow large users of the long-distance network to avoid subsidies by bypassing the local network.<sup>57</sup>

Such bypass creates a chain reaction that ultimately will severely reduce regulators' ability to enforce traditional cross-subsidies. The revenue base from which regulators collect the subsidies will eventually erode as the largest users of long-distance service bypass local networks. Loss of revenue from such bypass will necessitate increased access charges on remaining long-distance calls to maintain the former level of subsidization. In turn, this increase will make additional bypass profitable, resulting in a further erosion of the subsidy base.

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55. While no quantification of the depressed demand for these innovative services is available, the elevated prices clearly discourage demand. While recent authors have emphasized the importance of a state-of-the-art telecommunications infrastructure as a key to economic development, the development of economically efficient pricing would seem to be an equally necessary ingredient for the promotion of such innovative technological uses of the telecommunications network. For a more detailed discussion, see WILLIAM F. FOX & JOHN W. MAYO, *STATE-LEVEL TELECOMMUNICATIONS POLICY IN THE POST-DIVESTITURE ERA: AN ECONOMIC PERSPECTIVE* (1991).

56. In the U.S., long-distance prices will not fall to the true marginal cost of providing the service, but rather to the marginal cost plus the tax on long-distance firms from the carrier access charges which is the amount by which those charges exceed the marginal cost such firms impose on local exchange companies.

57. One example are the "nodal" services long-distance carriers have developed that effectively unbundle the purchase of access and long-distance transmission services, permitting very large telecommunications users to shop around for access services. Other forms of alternative access include direct fiber connections provided by one of the so-called "competitive access providers" or connection to a long-distance carrier via a microwave linkage.

The artificially high prices caused by the subsidy also increase the demand for new, less expensive bypass technology. Such technology will develop with time, increasing the amount of bypass that is profitable for any given level of access charges. Thus, rising access charges and improving bypass technology will both encourage more large long-distance consumers to abandon the local network to escape the subsidy.

This dynamic process places the burden of the subsidy on a continually diminishing group which uses long-distance services too infrequently to invest in bypass technology. Large business customers, as the most intensive users of the long-distance network, are most likely to bypass the local network. The burden of the subsidy will thus gradually shift to small businesses and residential customers. As the subsidy base erodes, regulators will eventually have to reduce the overall size of the subsidy. The long-run equilibrium of this dynamic process ultimately involves the elimination (or virtual elimination) of the subsidy as local rates rise to cover the average costs of the access/local usage bundle and the public switched network substantially disintegrates.<sup>58</sup>

The Federal Communications Commission (FCC) has recognized the dynamic nature and seriousness of the bypass problem.

The seeds of bypass have already spread and bypass activities already exist on a wide geographic basis. Because revenue losses from bypass activities are recovered by charging higher rates to remaining customers—residential subscribers and small business customers who are unable to bypass—the Commission continues to regard bypass as a serious problem at the current differentials between price and cost. The concentration of traffic is such that bypass can be expected to continue to grow so long as prices remain far above the costs of providing service.<sup>59</sup>

In addition, the staff of the Federal-State Joint Board wrote: “The reporting carriers claim that bypass is still a threat. The total estimated revenue lost, based on annualized 1988 rates, is \$3.5 billion.”<sup>60</sup> Thus, the potential for bypass poses a serious threat to the current pricing structure.

Bypass is a symptom of inefficient prices. The longer such prices remain, the more large business customers will choose to escape paying subsidies by circumventing the public network, and the higher the rates will become for

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58. We abstract from the potential for technological changes to reduce the cost of providing the access/local usage bundle. To the extent such changes occur, they will attenuate the upward pressure on prices that stems from the reduced subsidies. The propensity of “taxed” users to circumvent payment will continue, however.

59. FED. COMMUNICATIONS COMM’N, COMMON CARRIER BUREAU, THIRD REPORT ON BYPASS OF THE PUBLIC SWITCHED NETWORK (1987).

60. 4 FCC Rec. 5480 (1989).

customers remaining on the network. Those who claim to champion the cause of small residential customers by defending the current pricing system and downplaying the threat of bypass actually harm those very customers in the long run.

C. *The Current System Can Be Inequitable*

The current system is often inequitable. By inequitable, we simply mean that subsidies will flow, on occasion and with unknown frequency, from relatively poor individuals to relatively wealthy individuals. The current system of cross-subsidization clearly exhibits this property because it has no means of assuring that either the payers or payees of the subsidies are the desired or deserving groups.<sup>61</sup>

The identity of these desired groups depends upon the policy goal that the subsidy scheme intends to promote. If universal service is the goal, the group that receives subsidization should include only those households that would cancel their subscribership to the telecommunications network without the subsidy. Certainly, subsidizing all subscribers entails a much larger subsidy than this goal requires.<sup>62</sup> If, on the other hand, the goal is simply to reduce the cost of telephone service to families of limited means as part of a product-specific transfer program, then only households that meet some specified income criterion should receive the subsidy.<sup>63</sup> Consequently, promotion of this goal also fails to warrant subsidizing all local subscribers.

Not only does the untargeted nature of the current system of cross-subsidization provide subsidies to a larger group than either of the above policy goals justifies, but it also creates the possibility of perverse payments that conflict with fundamental notions of equity. For example, such a policy may transfer funds from relatively poor subscribers with a particularly heavy demand for long-distance calls, such as older citizens whose families have moved away, to relatively wealthy subscribers who confine the bulk of their residential calls to the local exchange, perhaps because of access to a WATS line at work. This sort of regressive transfer is inimical to the goals of income redistribution and universal service.

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61. The Lifeline and Link-up Programs established by the FCC and the Joint Board (a coalition of state and federal regulators) are exceptions. Under these programs, low-income households that meet certain eligibility conditions may receive explicit subsidization of either the initial installation charges or the ongoing flat-rate monthly charge for basic telephone service. A more complete description of these plans appears in FOX & MAYO, *supra* note 55, at 21-25.

62. See *infra* notes 67-70 and accompanying text.

63. Considerable overlap exists between these two groups due to a high income elasticity of the demand for customer access. See Paul Cain & James M. MacDonald, *Telephone Pricing Structures: The Effects on Universal Service*, 3 J. REG. ECON. 293 (1991).

D. *The Current System Does Not Promote Universal Service*

For many years and in many different forums, opponents of a more efficient pricing structure have argued that, although the current pricing system is economically inefficient, it is nonetheless necessary to promote the goal of universal service. Their underlying assumption is that cross-subsidization from long distance to local service is necessary to foster maximum household subscription to the public switched network. Moreover, supporters of this view often uncritically attribute the tremendous growth in subscribership levels over the past half-century to the existing pricing structure.<sup>64</sup> This widely-held view has been repeated so often without serious examination, it has become the telecommunications equivalent of the emperor's new clothes. This view is simply not subject to question.<sup>65</sup>

Close investigation of this position, however, reveals that it is both theoretically and empirically flawed. Theoretically, utilizing either local or long-distance services generally requires one to purchase access to the telecommunications network. The demand for access therefore depends upon the price of using both services.<sup>66</sup> Raising the price of one service (long-distance) to lower the price of the other (local) may not have a large net effect on the overall demand for customer access because these changes can offset one another. Customers will simply place fewer long-distance calls or long-distance calls of shorter duration (thereby reducing the demand for access) and more local calls (thereby increasing the demand for access) in response to this alteration of relative prices. The net effect on demand for access is therefore theoretically indeterminate.

Considering the price elasticities of long-distance and local telephone services underscores this indeterminacy. Specifically, raising the price of a relatively price elastic service (long-distance) to lower the price of a relatively price inelastic service (local usage) tends to reduce the overall demand for access. Moreover, the demand for customer access itself is extremely price-inelastic.<sup>67</sup> Therefore, any policy that attempts to increase subscribership levels

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64. Alternative explanations of the increase in subscribership include growth in incomes and the rising importance of the ability to rapidly communicate with a wider audience.

65. Indeed, when the FCC introduced its access charge plan in 1983, which effectively began a phasing out of the long-distance to local subsidy flows, Congressional backlash led to the proposed *Universal Telephone Service Preservation Act of 1983*, S. 1660, 98th Cong., 1st Sess. (1983). The purpose of this legislation was to promote universal service by using "long distance rates to subsidize rural and residential service" by "maintaining the status quo." The bill passed the House but died in the Senate. For a more detailed discussion, see PETER TEMIN, *THE FALL OF THE BELL SYSTEM: A STUDY OF PRICES AND POLITICS* 306-17 (1987).

66. For a discussion of the underpinnings of telecommunications demand theory, see TAYLOR, *supra* note 9, at 32-39.

67. See Cain & MacDonald, *supra* note 63, at 293; David L. Kaserman et al., *Cross-Subsidization in Telecommunications: Beyond the Universal Service Fairy Tale*, 2 J. REG. ECON. 231, 232 (1990).

by reducing the price of customer access is likely to have only limited success, particularly if the program does not target specific beneficiaries.

Those who assume that the long-distance to local subsidy promotes universal service typically presume that subscribership levels respond more to local rates than to long-distance rates. This presumption is not necessarily true, however. While it is true that the bundling of access and local usage under a single flat rate means that lowering the price of local service will lower the price of access as well, one must look further. Specifically, lowering the price of the local access/usage bundle necessitates an increase in long-distance rates. Because the demand for access is partially dependent upon these long-distance rates, this rate increase reduces the demand for access. The net effect of reduced local rates on access demand is thus indeterminate.

Bundling access and local usage together also necessarily increases the price of access to customers who place relatively few calls. Such customers, however, are the ones least likely to subscribe or most likely to cancel subscribership. In this respect, the current pricing system actually works against the goal of universal service. Regulators could promote this goal more successfully by adopting efficient pricing policies, including unbundled access and local usage and a much smaller subsidy targeted at specific groups, in place of the current policy of broad untargeted subsidization with access and local usage priced on a flat-rate basis.

Empirical studies support this conclusion. Bridger Mitchell found that replacing the existing pricing structure with a more efficient one utilizing a two-part tariff would significantly increase subscribership levels.<sup>68</sup> More recently, Kaserman, Mayo, and Flynn concluded that increasing the long-distance to local subsidy was unlikely to increase subscribership and that no significant relationship exists between carrier access charges and subscribership in either direction.<sup>69</sup> Finally, a recent empirical study by Hausman, Tardiff, and Belinfante of the demand for access to the telecommunications network found an inverse relationship between the demand for access and long-distance rates. Moreover, the study found the magnitude of this elasticity to exceed the price elasticity associated with changes in the basic monthly telephone rate (the own-price elasticity). Accordingly, the study concludes that a rebalancing of telephone rates, including an increase in the local monthly flat rate and a decrease in long-distance rates, could very well lead to an increase in subscribership.<sup>70</sup> In sum, the empirical evidence supports the conclusion that

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68. See Mitchell, *supra* note 9, at 532.

69. See Kaserman et al., *supra* note 67, at 234. Specifically, the study did not find higher levels of carrier access charges, with the consequential high long-distance/low local price rate design, to cause higher levels of telephone subscription. Moreover, the study also found no causal link between low subscribership levels and regulators' propensity to raise subsidy flows.

70. 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 (1993).

the subsidy flow from long-distance to local service has no significant positive effect on subscribership levels. The current inefficient pricing system does not, in fact, support the policy goal of universal service. The emperor has no clothes.

#### IV. Alternative Explanations for Regulators' Affection for Existing Cross-Subsidies

Why have regulators continued to cling to this complex web of cross-subsidies (to the extent mounting competition and bypass permit) despite the desirable attributes of efficient pricing, the undesirable attributes of the existing cross-subsidies, and the challenge to rationalize telecommunications pricing Kahn issued a decade ago? What is it about this arcane system that regulators find so attractive? To answer this question, we must delve into the positive theory of regulatory behavior—the theory of why regulators do what we actually observe them doing.

A prerequisite to influencing regulators' behavior is understanding the motivation behind their actions. If regulators do not respond to the arguments we present, it may very well be because we are presenting the wrong arguments or presenting the right arguments wrongly. No matter how firmly one believes an argument, it is unlikely to be convincing unless it is cast in terms that are meaningful to its audience.<sup>71</sup> Our purpose as economists is to offer the best policy advice possible. But if we expect policymakers to be receptive to that advice, we must provide information that is relevant to their concerns. To do so, we must understand their underlying motivations.

Two principal and fundamentally different theories of regulatory behavior exist.<sup>72</sup> The public interest theory holds that regulators' goals are generally consistent with the public interest. That is, they seek to achieve goals that the relevant enabling legislation at least approximately specifies. Such legislation typically directs them to make decisions that promote the public interest. Telecommunications legislation often identifies the goal of universal service as well. The public interest theory thus predicts that regulators will adopt pricing policies that enhance overall economic efficiency while simultaneously promoting universal service.

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71. It may also be true that regulators do not find the argument convincing. In the adversarial setting in which most regulatory decisions are made, regulators typically hear conflicting arguments and may be unable to identify the correct position.

72. Our taxonomy, though somewhat simplified, is consistent with the modern literature on regulation. Actually, one can identify four or five alternative explanations of such behavior. See Richard A. Posner, *Theories of Economic Regulation*, 5 BELL J. ECON. & MGMT. SCI. 335 (1974). On close inspection, however, these various explanations are merely variants of the theories described herein.



The economic theory of regulation, on the other hand, holds that regulators have goals independent of any directives in the enabling legislation.<sup>73</sup> Under this theory, regulators' decisions often reflect self-serving political or economic objectives. A principal-agent problem arises because pursuit of these objectives may often conflict with pursuit of the public interest. Specifically, while the regulatory body should ideally serve as the agent of the legislature (which is ideally the agent of the public constituency that elected them), sufficient latitude exists for regulators to substitute personal goals for those the law specifies.<sup>74</sup> The economic theory of regulation generally assumes that regulators' true objective is to maximize political support.<sup>75</sup> The theory thus predicts that regulators will favor policies serving the interests of what they perceive to be their primary political constituency.<sup>76</sup>

Which of these alternative theories is more consistent with the behavior of regulators in this industry? If the public interest theory were the operative model, regulators would immediately and enthusiastically embrace the sort of policies Kahn recommended, such as efficient prices and subsidies targeted at specific groups. These policies tend to maximize economic efficiency, foster equitable pricing, and promote universal service. The failure of regulators to adopt such policies provides strong evidence that this is not the correct theory to explain regulatory behavior, at least in the telecommunications industry.<sup>77</sup>

The existing cross-subsidies are not only inefficient, but they also create a pattern of subsidization that does not consistently promote universal service or equitable pricing. Flat-rate pricing, for example, reduces subscribership by increasing the price of local service to light users, who are the most likely candidates to leave the network. Similarly, the cross-subsidy from urban to rural customers is also likely to reduce overall subscribership because urban

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73. The seminal contribution to this literature is George J. Stigler, *The Theory of Economic Regulation*, 2 *BELL J. ECON. & MGMT. SCI.* 3 (1971). A flood of research in this vein has since occurred. Recent assessments include Roger G. Noll, *Economic Perspectives on the Politics of Regulation*, in 2 *HANDBOOK OF INDUSTRIAL ORGANIZATION* (Richard Schmalensee & Robert D. Willig eds., 1989); Sam Peltzman, *The Economic Theory of Regulation after a Decade of Deregulation*, in *BROOKINGS PAPERS ON ECONOMIC ACTIVITY, MICROECONOMICS 1* (Martin H. Baily & Clifford Winston eds., 1989).

74. See, e.g., Pablo T. Spiller, *Politicians, Interest Groups and Regulators: A Multiple-Principals Agency Theory of Regulation, or 'Let Them Be Bribed,'* 33 *J.L. & ECON.* 65, 66 (1990).

75. See Sam Peltzman, *Toward a More General Theory of Regulation*, 19 *J.L. & ECON.* 211 (1976).

76. Some states, such as Tennessee, choose public utility commissioners in direct elections so that their primary political constituency is comprised of prospective voters. In other states, including California, the governor appoints the commissioners with the approval of the state legislature. Particularly in this latter case, the state legislature and the governor are likely to be key political constituencies of regulators. For empirical evidence on the importance of legislative preferences in determining regulatory behavior, see Barry R. Weingast & Mark J. Moran, *Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission*, 91 *J. POL. ECON.* 765, 780 (1983). For specific evidence that legislative preferences affect state-level regulatory decisions in the telecommunications industry, see David L. Kaserman et al., *The Political Economy of Deregulation: The Case of Intrastate Long Distance*, 5 *J. REG. ECON.* 49, 52 (1993).

77. Our conclusion assumes that those who oppose efficient pricing have not so clouded the arguments that regulators cannot ascertain which policy best serves the public interest.

customers have better access to substitutes for direct telephone service such as pay phones and close neighbors. Both subsidies raise the price for the group with relatively elastic demand, causing overall subscribership to fall. The existing system is thus irreconcilable with either the public interest or universal service. We must conclude that regulators in this industry are not driven by these objectives. As a result, we can expect regulators to largely ignore policy advice focused on achieving economic efficiency and increased subscribership.

The economic theory of regulation, on the other hand, explains the facts quite well. To see this, we need only examine which customer group is the primary beneficiary of the existing system of cross-subsidies and whether that group is also likely to be the source of substantial political support for regulatory commissioners or the principals they represent. Local residential customers are the primary recipients of the benefits of the current pricing structure. The cross-subsidy from long-distance services keeps local rates low, and the subsidy from business customers keeps residential rates even lower. The other two cross-subsidies present under the current policy, from light users to heavy users and from urban to rural customers, both serve to spread the benefits of these low residential rates across specific subgroups within this general class of customers.<sup>78</sup>

The political support that local residential customers provide appears strong relative to other customer groups that pay the bulk of the subsidy (long-distance and business customers). This relative strength stems from four sources. First, local rates are more immediately observable than long-distance bills, which vary from month to month depending upon usage (including distance, duration, and time of day). Barring a rate change, local rates are constant from one month to the next. Furthermore, local rate increases receive widespread publicity. Thus, information concerning the treatment of this particular interest group by the regulatory commission is readily available.

Second, residential customers vote while business customers do not. Although business customers could become politically influential through such activities as direct lobbying and funding election campaigns, most firms' telephone bills constitute such a small portion of their overall costs that these

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78. This spreading is also consistent with the economic theory of regulation. See Peltzman, *supra* note 75.

activities are not usually worthwhile.<sup>79</sup> As a result, business customers generally do not participate intensively at regulatory hearings in this industry.<sup>80</sup>

Third, given the historical structure of rates in telecommunications, many people have come to view inexpensive local service as something akin to a social right and may perceive local rate increases as an infringement on that right. People often characterize local service as a necessity, while they see long distance as more of a luxury. Fourth, regulators keep rural residential rates low through rate averaging, thereby serving the interests of the politically influential rural consumer.<sup>81</sup>

Thus, among the interest groups that telecommunications pricing policy affects, local residential customers appear to be in the best position to exert pressure on policy makers. The most likely explanation of the observed reluctance of regulators to adopt more efficient pricing policies is their concern over the political repercussions of infringing, or even appearing to infringe, upon this group's interests. The regulators' affection for existing cross-subsidies stems from the belief that such subsidies engender substantial political support.

Regulators are therefore likely to remain unresponsive to appeals to adopt more efficient pricing policies based upon economic efficiency unless proponents of these policies convince them that such policies will not lead to unacceptably large local rate increases or that the required increases will not create the sort of political backlash that regulators fear. Fortunately, the evidence emerging from policy changes that have occurred to date appears to support both of these arguments. Specifically, regulators in a growing number of states have implemented two changes that represent the initial steps on the road to more intelligent telephone pricing and that opponents have predicted would lead to substantial local rate increases. First, many states have significantly reduced carrier access charges, largely in response to the threat of bypass.<sup>82</sup> Second, a number of states now allow interexchange carriers to compete with local exchange companies for intraLATA toll services.<sup>83</sup>

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79. George Stigler, *supra* note 73, points out that we should expect small, easily organizable groups with individually large stakes in regulatory decisions to dominate politically and therefore be the primary beneficiaries of such decisions. Empirical evidence, however, indicates that communications services are typically a very small share of firm costs. See FOX & MAYO, *supra* note 55, at 40. Thus, while businesses are far less numerous than consumers and, thus more easily organized, the relatively low per capita interests of firms in telecommunications makes it difficult for them to form effective coalitions on telecommunications pricing issues.

80. The contrast between the absence of business involvement in telecommunications regulatory hearings and the heavy involvement in electric cases seems to support this line of reasoning.

81. Independent telephone companies tend to represent the interests of rural customers at regulatory hearings. Also, residential consumers of local service tend to be heavily represented by Offices of Public Utility Counsel and State Attorneys General.

82. For documentation of these changes, see FOX & MAYO, *supra* note 55, at 17.

83. While states have authorized competitive entry by interexchange companies (for example, Sprint, MCI, AT&T), no state to date has implemented /+ equal access to all carriers providing intraLATA toll calls. Thus, for customers to make an intraLATA toll call by a carrier other than the local operating company, it is necessary for the customers to dial 1-0- followed by the particular carrier's access code, then

Various groups that benefit from the existing structure of access charges and intraLATA entry restrictions opposed both of these policy changes. To a large degree, the ground for such opposition has been the prediction that adopting these policies would necessitate large local rate increases.<sup>84</sup> Despite these predictions, the feared rate increase and resulting political uproar have failed to materialize. For example, in states that have adopted open intraLATA entry policies, local rates have changed, on average, at virtually the same rate as in those states that have continued to prohibit interexchange carriers from entering intraLATA toll markets.<sup>85</sup> Similarly, substantial reductions in intra-state carrier access charges have failed to exert the pressure on local rates that many had predicted.<sup>86</sup> Thus, it appears that the opponents of change have greatly exaggerated the consequences of implementing a more efficient telephone pricing structure. The resulting fear of such negative political consequences has to this point stalled regulators' progress on the road to improved telecommunications pricing policy. Regulators can, in fact, proceed down the road to more intelligent pricing without sacrificing their political support or careers.

## Conclusion

The case for more intelligent pricing of telephone services is compelling. Such pricing substantially improves economic efficiency and increases subscribership levels. Economists generally disapprove of the current pricing structure in this industry with its complex system of untargeted and economically unwarranted cross-subsidies. As a result, the economics profession has expressed both surprise and disappointment at the lethargic pace at which regulators have proceeded down the road to more intelligent pricing policies that the literature so clearly identifies.

We have attempted to explain regulators' apparent disinterest in the economic arguments that have appeared to date. The explanation requires an understanding of regulators' affection for the system of cross-subsidies that economists find so patently unattractive. We can achieve that understanding through a straightforward application of the economic theory of regulation to the pattern of subsidies involved in telecommunications pricing. This pattern of subsidies effectively distributes its benefits across all major subgroups within

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the number they wish to reach. For a more detailed discussion, see Kaserman et al., *supra* note 25, at 8.

84. This argument (or threat) has succeeded in forestalling these policy changes in a number of states.

85. See Kaserman et al., *supra* note 25, at 24-25.

86. When regulators reduce carrier access charges, toll rates tend to fall. Falling toll rates stimulate an increased volume of toll calls, generating more access charge revenues. In addition, the demand for toll calls has risen over time, increasing the access charges that local exchange companies collect, while these companies' fixed costs have been relatively constant. Consequently, access charge reductions have not necessitated substantial local rate increases.

the politically dominant interest group of local residential customers. Regulators believe they maximize their political support by maintaining the existing structure of cross-subsidies.

An improved understanding of regulatory behavior allows a more effective approach to address regulators' reluctance to abandon the historical pricing structure in telecommunications. We do not need to convince regulators that universal service can survive efficient pricing or that adopting the recommended policies will improve economic efficiency. Rather, we need to convince them that local rates will not increase substantially and that the political consequences of those relatively small increases that efficient pricing requires will not be severe. Instead of continuing to explain the virtues of efficient pricing and admonishing regulators to "do the right thing," we need to go a step further to explain that the regulator will not sacrifice his political career, and may actually enhance it, by adopting efficient prices. If regulators are to heed our advice, we need to tailor our arguments to address the concerns of regulators, not economists. We have been preaching to the choir, and, in so doing, we have turned our backs on the congregation.

