



Federal Communications Commission
Office of Plans and Policy
1919 M Street NW
Washington, DC 20554

OPP Working Paper Series

10 The Effects of Higher Telephone Prices on Universal Service

March 1984

Kenneth Gordon
John Haring

The FCC Office of Plans and Policy's Working Paper Series presents staff analysis and research in various stages. These papers are intended to stimulate discussion and critical comment within the FCC, as well as outside the agency, on issues in telecommunications policy. Titles may include preliminary work and progress reports, as well as completed research. The analyses and conclusions in the Working Paper Series are those of the authors and do not necessarily reflect the views of other members of the Office of Plans and Policy, other Commission staff, or the Commission itself. Given the preliminary character of some titles, it is advisable to check with authors before quoting or referencing these Working Papers in other publications.

Copies of the Working Paper Series may be available for a limited time from the Office of Public Affairs, Federal Communications Commission, Room 207, 1919 M Street, N.W., Washington, DC 20554 (202/254-7674). Copies may be purchased from the Downtown Copy Center, 1114 21st Street, N.W., Washington, DC 20037 (202/452-1422). Copies are also available from The National Technical Information Service, Springfield, VA 22161 (703/487-4650). The inside back cover contains a list of previous titles.

For information on the Series, contact the Office of Plans and Policy, Federal Communications Commission, Room 838, 1919 M Street, N.W., Washington, DC 20554 (202/653-5940).

Are Recent FCC Telephone Rate Reforms a
Threat to Universal Service? */

by

Kenneth Gordon and John Haring **/

*/ This paper was originally prepared for presentation at the Fifteenth Annual Conference of the Institute of Public Utilities in Williamsburg, Virginia on December 14, 1983, but has since been revised to take account of comments and more recent research. The views expressed are those of the authors and are not meant, nor should they be construed to reflect those of the Federal Communications Commission or any other member of its staff.

**/ Office of Plans and Policy, Federal Communications Commission, Washington, D.C. 20554.

I. Introduction

This paper addresses the question of whether recent pricing reforms undertaken by the Federal Communications Commission (FCC) constitute a threat to "universal" telephone service. The paper is organized as follows: Section II provides legal and historical background on the universal service policy goal and examines conceptual issues surrounding the definition of universal service and possible economic rationales for government intervention to bring it about. Section III analyzes demand for telephone access and surveys recent econometric evidence on the sensitivity of demand to changes in prices and other demand-influencing factors. Section IV describes the price changes attributable to recent regulatory decisions, in particular those related to the FCC's plan to implement a system of flat access charges to cover nontraffic-sensitive costs of providing telephone service. Net price effects of these policy changes are not large and given that reforms are to be phased in over several years (during which other factors will be operating to increase demand) and that demand for access is estimated to be relatively insensitive to price changes, our conclusion is that any effects on telephone subscribership are likely to be quite small. Section V considers policy issues and examines alternative means for mitigating any adverse effects that might occur as a result of implementing a system of access charges. Section VI contains a brief summary of principal conclusions.

II. Universal Service

A. Legal and Historical Background

The term "universal service" appears in no public law and there is no authoritative source defining precisely what it means, let alone how it might best be achieved. Within the telephone industry it is a shorthand expression generally used to refer to Title I of The Communications Act of 1934. That title requires regulation "to make available, so far as possible, to all the people of the United States a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges." 1/

In simple terms universal service might be taken to mean that every household has, or readily could have, convenient to its premises, the ability to make or receive telephone calls. That is what the term meant to Theodore Vail, the man who coined it in 1910. He believed that "some sort of a connection with the telephone system should be within reach of all." 2/ In modern discussions the issue is usually framed in terms of whether an individual has "access" to the telephone network. Bridger Mitchell (1982) notes that a binary view of access -- an "either you have it or you don't" conception -- presumes a definition of "access." In the above definition, the words "has," "readily could have" and "convenient to its premises" obviously admit some degree of flexibility into the definition of access and hence

1/ Title I, Section II, The Communications Act of 1934, As Amended, 47 U.S.C. § 151.

2/ The quotation is from AT&T's annual report for the year 1910. See Alvin von Auw (1983, p. 5).

universal service. Vail's "some sort of a connection. . . within reach" can mean a lot of things. Do pay phones nearby count? Should a distinction be drawn between persons who voluntarily "choose" not to subscribe and persons who are "forced" to drop or forgo service because of higher prices? More fundamentally, can such a distinction actually be validly drawn? If a consumer refuses to subscribe when offered the option of paying a nominal access charge and higher per-call charges, has that consumer been forced off the network or denied access? 3/

In this paper access is defined in terms of a household's first on-premise connection to the network. On that definition a pay phone in the hallway of a rooming house or college dormitory does not provide access to the telephone network, although there is clearly a sense in which that is precisely what it does. A "lifeline" service providing dial-tone and a limited number of local calls for a fixed charge does provide access. Thus defined, the level of access to the telephone network in the United States is very high indeed. As illustrated in Table 1, it averages well above 90

3/ The difficulties inherent in this issue require an understanding of the economist's notion of consumer surplus. Roughly, this is the total value of telephone service left to the consumer after he has paid for the calls actually made. It is a measure of the maximum he would be willing to pay for the right to make calls. As per call prices rise, the "surplus" shrinks, and if that surplus becomes zero or negative the customer will drop off the system. The fact that the consumer could stay on the system (while making fewer calls) for a smaller total outlay is irrelevant. Under the new conditions, being on the system is less valuable to him. The issue lies in the consumer's valuation of the service that is offered, not in whether he could continue to receive access, but less service, for the same or a smaller total outlay. For a brief but useful discussion see Lester D. Taylor (1980b). See also Lewis J. Perl (1983), pp. 19-20.

Table 1: Telephone Penetration in the United States,
by State, December 31, 1981 ^{1/}

State	Percent Households with Telephone Service ^{2/}	State	Percent Households with Telephone Service ^{2/}
Alabama	87	Montana	95
Alaska	90	Nebraska	100
Arizona	95	Nevada	84
Arkansas	85	New Hampshire	99
California	100	New Jersey	108
Colorado	97	New Mexico	86
Connecticut	103	New York	97
Delaware	100	North Carolina	91
District of Columbia	103	North Dakota	98
Florida	98	Ohio	94
Georgia	88	Oklahoma	96
Hawaii	98	Oregon	86
Idaho	92	Pennsylvania	99
Illinois	99	Rhode Island	98
Indiana	92	South Carolina	86
Iowa	95	South Dakota	92
Kansas	96	Tennessee	88
Kentucky	86	Texas	95
Louisiana	93	Utah	93
Maine	98	Vermont	101
Maryland	99	Virginia	91
Massachusetts	101	Washington	90
Michigan	98	West Virginia	85
Minnesota	99	Wisconsin	98
Mississippi	82	Wyoming	89
Missouri	94		
		United States	96

^{1/} Source: Federal Communications Commission, Statistics of Communications Common Carriers, 1981, Table 6. Original source, American Telephone and Telegraph Co.

^{2/} Households with service are the sum of residence main, apartment house PBX and residence service main telephones, and other residence PBX systems. There tends to be a slight overstatement of the proportion of households with telephone service.

percent for the nation as a whole and for certain states approaches 100 percent. The goal of universal telephone service has been substantially achieved in the United States. 4/

Table 2 shows how telephone penetration rates in the United States have grown over time. The growth and current high level of telephone subscribership can be accounted for economically in terms of increases in both supply and demand. On the supply side, continuous improvements in technology have gradually reduced the real costs of telephone service, extension of service to rural areas has been promoted by governmental loan subsidies and local residential service (including access) has been funded in part by overcharges on long-distance calling. 5/ On the demand side, changes in virtually all demand-influencing factors have been in a direction increasing demand (The telephone demand relation is discussed in Section III).

B. Economic Rationales for Public Policies to Promote Universal Service

There are two economic rationales that might justify government intervention to promote a level of telephone subscribership greater than that which would occur under a regime in which consumers pay prices that reflect

4/ For penetration data, by state, based on the U.S. Census (1980) see Lewis J. Perl (1983), Figure 24a. Our allegation in the text that universal service has been substantially achieved in the U.S. should not be taken to imply that this is the economically efficient level of telephone subscribership. The latter is achieved when the marginal social value of an additional subscriber equals the marginal social cost of adding that subscriber. When these costs amount to many thousands of dollars per subscriber, as is sometimes the case, it would not be surprising if the costs of providing the service greatly exceeded the benefits.

5/ Jeffrey Rohlfs (1978) has estimated that the marginal cost of interstate long-distance message services was about 30 percent of price in 1976.

Table 2: Development of Residential Telephone Service
in the United States, 1961 - 1981 1/

Year	Percent Households with Telephone Service	Year	Percent Households with Telephone Service
1981	96	1970	92
80	96	69	90
79	98	68	89
78	97	67	88
77	96	66	87
76	95	65	85
75	94	64	83
74	94	63	81
73	94	62	80
72	92 <u>2/</u>	61	79
71	93		

1/ Source: Federal Communications Commission, Statistics of Common Carriers, various years, Table 6. Original source, American Telephone and Telegraph Co.

2/ 1972 and earlier years exclude Alaska and Hawaii.

costs of providing service. These are the existence of important external effects and the political classification of telephone access as a "merit good."

The externality argument as it is usually applied to telecommunications posits the existence of important consumption externalities. 6/ A positive consumption externality occurs when consumption of a product by one person directly increases the economic welfare of others. The value to any individual of being on the telephone network depends on the availability of others to call (or be called by). In deciding whether to subscribe to telephone service, an individual may not take the value to others of his own presence on the network fully into account. 7/ Hence, in certain circumstances it could conceivably be socially efficient to subsidize access to the telephone network. In particular, a subsidy can be justified on externality grounds assuming two conditions are satisfied: (1) There are individuals for whom costs of service exceed personal benefits and who, therefore, would not subscribe without a subsidy, but whose presence on the network is socially efficient when the external benefits are reckoned; and (2) The external benefits exceed the costs of subsidization.

While the consumption externalities hypothesis is frequently cited in support of subsidies to particular groups, there is little empirical evidence to support it. Summarizing the extant literature in his 1979 treatise on telecommunications economics, S.C. Littlechild (p. 182) concludes that the evidence "is not sufficiently reliable to disprove the externalities

6/ See Jeffrey Rohlfs (1974), Roland Artle and Christian Averous (1973) and Lyn Squire (1973).

7/ We stress the word "may". An important reason for subscribing to telephone service is that people are aware that others may wish to contact them.

hypothesis, but neither does it offer support for it. An explicit attempt to test the hypothesis would seem to be indicated."

Recently Lewis Perl (1983) has carried out a limited test of the externality hypothesis. His work suggests that there may be a very modest consumption externality associated with telephone access at the local level, that is, telephone subscribers in a particular locality may benefit in a small way and up to a certain point from increases in local network subscribership. If governmental internalization of these externalities were necessary (private internalization efforts proving inadequate) and could be cost-justified (problematic according to Perl), that would at most provide an economic rationale for intervention to internalize externalities at the local level. Note also that attempts to internalize consumption externalities at the local level would simultaneously operate to limit any similar externalities that might exist over broader geographical areas. 8/ The reason is that a subscription to telephone service provides "access" to the unified local and interstate network.

Externalities by themselves never justify government intervention. Demonstrations that benefits from intervention exceed costs are necessary to justify intervention. Individuals can be expected to undertake activities that generate external benefits without being subsidized whenever the private gain they expect to reap exceeds the cost they must bear. In terms of telephone access, this implies that the consumption externality, if it exists, will be automatically internalized whenever an individual deems that the

8/ An externality is internalized when a decision maker takes the relevant cost or benefit into account in his decisions. This may occur as a result of the government's altering the prices or other circumstances facing the decision maker, or through private arrangements, some of which are discussed in the text below.

that the private benefit of having access to the telephone network exceeds the actual cost of access. When private benefits exceed costs, individuals will voluntarily subscribe and simultaneously generate external benefits (perhaps minimal) for other subscribers in the form of a more valuable network. In this situation there may be external effects, but they are not relevant for policy because other determinants of subscribership lead them to be internalized without the need for subsidies or other forms of government intervention.

In addition to this (presumably widespread) automatic internalization, there are other forces operating to internalize external effects. Robert Preece (1983) points out that few callers ever talk to more than a small percentage of telephone subscribers and that calls generally go to friends, relatives and business associates. He argues that people, in effect, form "clubs" where those with an interest in mutual accessibility voluntarily agree to join the same network. In the same vein, subscribers for whom maintenance of family ties is especially important can pay to have telephones installed for their relatives, just as they can share the costs of calling. Businessmen whose own calling requirements may warrant only a single line have a profit incentive to acquire additional lines so that potential customers can call them. In these cases external effects will be internalized because sufficient benefits accrue to particular individuals to make internalization worthwhile.

The existence of external benefits cannot be used to justify subsidies unless actual methods of subsidization are specified and their costs evaluated. On the one hand, when opportunities for strategic behavior 9/ are

9/ Strategic behavior occurs when individuals or firms respond to a subsidy by incurring unnecessary costs and engaging in otherwise wasteful activities simply in order to take advantage of the subsidy. In particular, it could mean shifting costs into the subsidized cost category.

recognized, the task of designing an efficient system of subsidies is by no means simple. 10/ On the other hand, the alternative to selective subsidies targeted to desired nonsubscribers is a blanket subsidy to all (paid by whom?). This kind of approach is extremely wasteful in that most of the people subsidized would have subscribed without the subsidy. Unless subsidies are funded with government revenues, they will need to be financed by increasing user charges. That will cause a misallocation of resources and losses of economic welfare. 11/ These costs must be balanced against the benefits of having additional subscribers on the network. 12/

At low levels of penetration, it might be possible to argue for government intervention to internalize consumption externalities associated with telephone access. Whether such intervention actually represents sound public policy would still depend on how much it costs, the magnitude of the external effects and the extent of private internalization efforts. At current high levels of penetration and faced with the prospect of relatively modest short-term cost increases, the externality argument supplies at best a weak basis for opposing rate reform. Recognition that the current system of cross-subsidies will become increasingly unsustainable in a competitive environment further weakens that basis for opposition to change. Finally, if

10/ See Comments (in passim.) throughout the Joint Board proceeding (CC Docket 80-286). Several commenters remarked that the proposed subsidy plan would reward inefficiency and penalize efficient operations. Many also noted the tenuous connection between subsidy and need in the proposed plan.

11/ James M. Griffin (1982) estimates the economic welfare losses associated with current inefficient pricing practices to be on the order of \$1 billion per year. He (p. 66) concludes that "the existing degree of cross subsidization of local service by long-distance service cannot be justified by welfare economics." See also footnote 24, below.

12/ For some estimates of the costs involved in extending a subsidy to broader groups see Lewis J. Perl (1983), Figure 14.

uninternalized consumption externalities are a serious regulatory concern, a policy of encouraging measured-service offerings may be one appropriate way to respond. ^{13/} Low-cost service options can help poor people by expanding the options available to them. Forced bundling of dial tone with unlimited local calling raises the cost of telephone service for many consumers.

The "merit good" rationale for subsidizing telephone service is simply a different form of the consumption externality hypothesis and, as such, is subject to all of the aforementioned criticisms, most importantly the externality argument's vacuity as a genuine guide to policymaking. ^{14/} In this case the posited source of external benefits is not the ability to call subscribers who without a subsidy would not be available for calling; it is rather the utility allegedly derived by others simply from knowing that subsidized subscribers are hooked up to the telephone system.

The case for assigning merit-good status to telephone service is weak. For a merit good like school lunches, an in-kind transfer (lunch versus lunch money) can be justified on the grounds that external benefits to the population at large derive from improved nutrition among young people rather than greater monetary income which might be spent on junk food. For the adult poor, it is by no means clear that external benefits associated with income redistribution are, in general, tied closely to consumption of particular goods. While there is a strong case for helping the poor, there is little

^{13/} A number of consumer groups, as well as some governmental officials, have expressed opposition even to having local measured service as an option.

^{14/} Richard Musgrave (1959, p. 13) describes merit wants as involving goods "so meritorious that their satisfaction is provided for through the public budget [this would include regulatory reassignments of costs], over and above what is provided for through the market and paid for by private buyers[...]. The satisfaction of merit wants, by its very nature, involves interference with consumer preferences." (Musgrave, 1959)

basis other than paternalism for arguing that help should necessarily take the form of below-cost telephone access. 15/

But even if a political judgment is made that help for the poor should take the form of subsidized telephone access, that would still not justify a blanket subsidy. It may be that one of the "goods and services" we wish collectively to consume is consumption of telephone service by poor people, but presumably we also collectively prefer that this be done in a manner that minimizes the effective cost to society. If we really want to help the poor, we should do so efficiently, so we can help them even more. It is well worth noting that there is currently no evidence that either past or proposed assistance programs for telephone service are either targeted toward deserving groups or formulated in such a way as to minimize the costs of subsidizing telephone service for the poor.

III. Determinants of Demand for Telephone Access

A. Theoretical Framework

To gauge the effects of changes in regulatory policy on consumer demand for access to the telephone network requires an economic model or theory describing the important factors that affect consumers' decisions to subscribe to service. As with any scientific model, a good economic model does not attempt to duplicate reality, an impossible task in any event. The goal is to abstract from reality in such a way that much may be explained by

15/ It is a commonplace in economic theory that transfers of cash are more efficient than transfers in kind. See, for example, J. Hirshleifer, (1980, pp. 118-122).

comparatively little. 16/ This process of abstraction necessarily involves exclusion of what may be critical influences for particular individuals. The focus is instead on general influences that affect most consumers and predictions are, for this reason, forecasts about average effects. 17/

Economic analyses of telephone demand treat telephone service like any other scarce good. Demand is hypothesized to depend upon the price of service, the prices of complementary goods, the prices of substitute goods, personal income, individual tastes and preferences and so on. Changes over time in virtually all these factors have tended to increase the fraction of consumers who subscribe to telephone service. In real terms, the prices of telephone service and its complements have been falling, the prices of substitutes for telephone service have been rising, personal incomes and the value of time have been rising and demographic changes (e.g., overall aging of the population, an increase in the number of single-head households, etc.) have been working to increase demand for access to the telephone network.

In evaluating the effect of price changes stemming from changes in regulatory policy, the idea that telephone demand is determined by many factors needs to be kept firmly in mind. To make accurate predictions of future demand requires that one simultaneously project the values of all relevant, demand-influencing variables not just the price of access, into the future. Failure to do so involves the implicit assumption that the values of other relevant variables are not going to change in the future. While that is logically possible, it is extremely unlikely.

16/ See Milton Friedman (1971).

17/ This does not imply that effects on non-average individuals are unimportant. However, it may be the case that their special circumstances need to be addressed specifically -- that is, more narrowly targeted -- in any policy response to their problems.

This is an important point in that under the FCC's plan, access charges would be phased in over several years. 18/ To the extent that other factors affect demand and their effects are in the opposite direction from access charges, they act to mitigate the effect of access charges. Rising prices for energy and other substitute goods (postage, time), falling prices for telephone instruments, long-distance service and other complementary goods (home computers, alarm systems, shopping services), rising real incomes, an aging population and other factors all operate to offset the effect of access charges gradually being phased in. Failure to take the effects of these other demand-influencing factors into account will result in an understatement of the subscriber penetration levels actually likely to prevail in the future. 19/

B. Empirical Estimates of Demand Elasticity Parameters

There are a large number of studies which attempt to estimate the parameters of the telephone demand relation empirically. 20/ These studies

18/ See Memorandum Opinion and Order in CC Docket No. 78-72, Phase I (Second Reconsideration), Released February 15, 1984 (FCC 84-36).

19/ Empirical evidence on the effects of price changes, while not ideal, is much more highly developed than evidence on the importance of other demand influencing variables. The temptation to rely solely on price information, simply because it is the most readily available, must be resisted if reasonable forecasts of the effects of restructuring telephone rates are to be made. This should be kept in mind as the next section is read.

20/ Studies submitted in CC Docket No. 83-788 (the so-called Michigan proceeding) include: Bruce L. Egan (1983), A. Noel Doherty (1983), Michael T. Carr (1983), Data Resources, Inc. (1983), Gail A. Gearity (1983), Lewis J. Perl (1978 and 1983), Richard Reinking (1983), Charles River Associates (1983), Richard M. Oveson (1983), Laurits R. Christensen (1983), and Richard C. Miller (1983). Other studies include: J. H. Alleman (1977), J. Feldman (1976), B. E. Davis et. al. (1973), Garry P. Mahan (1979) and P. Heidt (1979). The demand literature has been surveyed by Lester D. Taylor (1980) and Gary W. Bowman and Wayne A. Morra (1983).

vary widely in quality, type and source of data utilized, theoretical model specification and statistical estimation technique. Significantly, despite these differences, the studies indicate almost uniformly that demand for access to the telephone network is highly insensitive to price changes (See Tables 3 and 4). 21/ Moreover, there is evidence that demand has been becoming progressively more inelastic over time. 22/

While existing estimates indicate a highly price-inelastic demand for telephone service, there are good reasons grounded in statistical theory which suggest that these estimates still probably overstate the actual degree of price sensitivity. This strengthens the basis for concluding that effects of recent federal decisions on levels of telephone subscribership are likely to be small. If, under assumptions which overstate the likely impact of those decisions, the impact is nevertheless small, there is a strong analytical basis for drawing that conclusion.

One source of upward bias in estimates of price elasticities arises because demand for telephone service has been growing over time while the price of service has been falling. In price-theoretic terms, the demand curve has been shifting outward to the right at the same time there have been movements downward along that demand curve. This implies that estimates based on data from more distant historical periods will overstate the actual current

21/ Estimates range from 0 to -0.24, with most of the estimates falling below -0.09. As the FCC Staff concludes in its report of findings in Docket No. 83-788 (1983, p. 28), "Those studies using the best and most recent data and having the best specified theoretical framework yield estimates at the lower end of this range."

22/ On the basis of 1970 data, Perl estimated an elasticity of -0.09. On the basis of 1980 data, he found that elasticity had fallen to -0.03. As Perl notes (pp. 13-14), there are good theoretical reasons to expect the elasticity to have fallen as penetration increased.

Table 3: Access Demand Elasticities cited in
Analysis of the Effects of Federal Decisions on
Local Telephone Service a/

Study	State (Co.)	Customers	Elasticity Estimates		
			Short Run	1 Year	Long Run
Egan	AR, KS, MO, OK, TX (Bell)	Business	-.01	-.03	-.07
Egan	AR, KS, MO, OK, TX (Bell)	Residence	-.01	-.03	-.04
Doherty	NY (Bell)	All -.04	-.09	-.11	
Carr	NY (Rochester)	Business	NA	-.05	NA
Carr	NY (Rochester)	Residence	NA	-.04	NA
DRI	CT (Bell)	Business	-.04	-.13	-.15
DRI	CT (Bell)	Residence	-.03	-.08	-.08
Gearity	TN (United)	All -.24	-.24	-.24	
Gearity	VA (United)	All -.22	-.22	-.22	
Perl	National Survey (1970 data)	Residence	NA	NA	-.09
Perl b/	National Survey (1980 data)	Residence	NA	NA	-.03
Reinking	UT (Bell)	All -.04	-.04	-.04	
Miller	MI (Bell)	All -.08	-.08	-.08	
Alleman b/	National, Cities	Residence, FR NA	NA	-.17	
Alleman b/	National, Cities	Residence, FR&MS	NA	NA	-.02
Feldman	National, States	Residence	NA	NA	-.05
Davis et al	Bell System	All NA	-.02	-.08	
Mahan	NC (United)	Residence	NA	NA	0
Heidt	NE Tel. (Bell)	Residence	-.04	NA	-.20

a/ Source: Analysis of the Effects of Federal Decisions on Local Telephone Service, A Report after Inquiry in CC Docket 83-788, Common Carrier Bureau, December 9, 1983, Table 2, page 25.

b/ The estimating equations used by the authors of these studies make some provision for the availability of substitutes for flat rate service such a local measured service, where available. Theoretically this should improve their usefulness as measures of the elasticity of demand for access.

Table 4: Estimates of Price and Income Elasticities of Demand for Access from: Lester D. Taylor - Telecommunications Demand: A Survey and Critique a/

A b/

Class of Customer and Study	Dependent Variable	Price Elasticity			Income Elasticity	Type of Data
		Service Connection Charge	Basic <u>c/</u> Service Charge			
Residential						
Alleman	main stations	NE	-0.17	0.56		CS: Cities, U.S.
Feldman	main stations plus extensions	NE	-0.05	0.54		CS: States, U.S.
Perl	telephone availability	-0.12	-0.08	0.15		CS: Households, U.S.
Rash	main stations	NE	-0.11	0.61		TS: A, Ontario and Quebec
Waverman	main stations	NE	-0.12	0.15		TS: A, Ontario and Quebec
Business						
Waverman	main stations	NE	-0.09	NE		TS: A, Ontario and Quebec
Residential & Business Combined						
Davis et al.	total tele-phones less residence main stations	NE	-0.08	0.39		TS: A, Bell System, U.S.
Waverman	main stations	-0.04	-0.06	0.56		TS: A, Sweden

Symbols: NE: not estimated; CS: cross-section; TS: time series; A: annual

B d/

Type of Demand	Elasticity		
	Service Connection Charge	Monthly Service Charge	Income
Access	-0.03 (+0.01)	-0.10(+0.09)	0.50 (+0.10)

a/ Ballinger, Cambridge, 1980.

b/ page 80, Table 3-1. Includes non - U.S. data.

c/ Note that this includes both access and a certain amount of local calling, and is therefore an upwardly biased measure of the elasticity of demand for access alone. Perl's specification includes the availability of local measured service, which partially corrects for this problem.

d/ page 170, Table 5-1. Taylor provides the following explanation of these numbers:

"These estimates refer to long-run, steady-state elasticities. [...] The estimates reflect my own interpretation of the empirical record (for both foreign countries and the United States) and are thus highly subjective. The numbers in parentheses are subjective standard errors.

elasticity. 23/ Those estimates are based on data that lie outside the range of more recent experience. They were made (or, more precisely, the underlying data were generated) during periods when prices were higher, demand was lower and penetration rates were lower. A price increase will have a different effect depending upon the initial level of demand and the initially prevailing price. The effect of a price change today will be smaller than it would have been 15 years ago because the real price is lower today and the level of demand is higher.

A more general source of upward bias in existing estimates results from misspecification of the empirical model. Some of the estimates are based on models which relate subscribership to total charges rather than to charges for simple access. 24/ Demand for access (the option of making or receiving calls) is presumably less elastic than demand for local or long-distance calling. Faced with higher prices, most consumers will economize on usage, where that is possible, rather than forgo service altogether. Estimates of elasticity based on charges for total service will therefore overstate the elasticity of demand for access alone. Relatedly, when alternatives (substitutes) for flat-rate service are included in the specification of demand, the measured elasticity of demand for access falls. 25/ This suggests that some people will respond to higher prices by selecting lower-cost

23/ For example, use of the Perl estimate based on 1970 data to gauge the effect of price changes in 1980 would, given the magnitude of the elasticity parameter actually measured using 1980 data, result in overstatement of the likely effect by a factor of three.

24/ See Table 3, infra, and its footnote b.

25/ In Alleman's model the measured elasticity fell from -0.17 to -0.02 when measured service offerings were included in the specification of the model. Perl (1983) also finds that the availability of measured service reduces the estimated elasticity of demand for access. See Figure 6, p. 17.

alternatives (measured service, lifeline options, etc.) 26/ rather than dropping off the network. Omitting the prices of relatively close (and less expensive) substitutes thus leads to an overstatement of the elasticity of demand for simple access.

A similar upward bias results from failure to account explicitly for the effects of changes in prices of closely complementary goods and services, in particular telephone equipment and long-distance service. 27/ Lewis Perl's studies are illustrative in this regard. Perl finds that demand for access has become more price inelastic over time. The reason is that other demand-influencing factors (largely omitted from Perl's models) operated in the same direction as price changes during the interim between study sample periods (viz., the decade of the seventies). Changes in most demand-determining factors increased demand, and these combined with lower prices imply that a reduction in measured elasticity should be observed, as discussed above. If there had been no changes in the underlying structure of demand between the two sample periods, the initially estimated price elasticity coefficient would provide a biased measure of the actual effect of price changes (because it reflects the effects of omitted variables as well), but would nevertheless generate accurate predictions because of the (assumed) stability of the underlying demand structure.

In Perl's new study long-distance rates are not included as a factor affecting the demand for access, although there are good reasons to believe there is a strong complementary relationship between the two. This means that

26/ Measured service offerings are available to about 70 percent of the residential subscribers served by Bell operating companies.

27/ Complementary goods are goods always or often used in conjunction with each other, e.g. - tennis racquets and tennis balls. A drop in the price of one will increase the demand for the other.

the price coefficient picks up some of the influence of changes in long-distance rates, among other things. That will not affect the predictive capability of the model as long as the underlying demand structure remains the same. Implementation of access charges will, however, result in lower long-distance rates -- an important change in the underlying structure of demand which operates in the opposite direction from the effect of higher access charges. Lower telephone equipment prices have a similar effect. In Perl's model the price coefficient must, therefore, overstate the effect of access charges and that coefficient is, of course, already close to zero. 28/ That would not contradict the law of demand. It would simply imply that there are very few people at the margin at current prices. In this regard it is interesting to note that the "consensus" demand elasticity estimate given by Lester Taylor (1980, p. 170) in his survey of the telephone demand literature is constructed with near-zero as the lower boundary. 29/

28/ Indeed, in a statistical sense, it may well be zero, since recognition of upward bias leads one to question results of tests for statistical significance. If a confidence interval were constructed for an unbiased point estimate at a conventional level of confidence (say 95 percent), it might well include zero. In that case the null hypothesis that small price changes have virtually no effect on demand could not be rejected.

29/ Taylor's "highly subjective" estimate is that the true elasticity of demand for access lies between -0.01 and -0.19. (Taylor, 1980a, p. 170) See also Table 3, infra.

IV. Effects of Regulatory Decisions on Costs

A. Policy Changes

The most important policy change to be considered is that mandated in the FCC's so-called access charge order in Docket 78-72. ^{30/} In that order the Commission calls for a restructuring of the way in which nontraffic-sensitive (NTS) costs of providing telephone service are recovered. Hitherto, about 25 percent of these costs have been recovered through usage-sensitive charges paid by long-distance users. This meant that a person who made no long-distance calls could avoid paying the full costs of his access line. In particular, he could avoid that portion of the NTS costs allocated (arbitrarily in economic terms) to the federal jurisdiction and recovered in usage sensitive long-distance overcharges. At the same time, customers who made heavy use of long distance bore more than their fair share of access-line costs. The FCC now proposes to cover these costs through a system of flat (i.e., usage-insensitive) subscriber fees to be phased in gradually over five years.

Whether the evolution of competition in telecommunications is attributed to technological breakthroughs, altered regulatory perspectives, or both, the consequences are the same. In a competitive environment prices for telephone services will be driven toward costs (including a competitive return on capital investment). That means that any subsidies, inappropriate

^{30/} MTS and WATS Market Structure (CC Docket No. 78-72, Phase I), 48 Fed. Reg. 10319 (Mar. 11, 1983) (Third Report and Order), recon. 48 Fed. Reg. 42984 (Sept. 21, 1983), review pending sub nom. NARUC v. FCC, No. 83-1225 (D.C. Cir.), second recon. Memorandum Opinion and Order released February 15, 1984 (FCC 84-36).

depreciation schedules, overextensive cost-averaging or similar distortions will not be sustainable as competition spreads. The history of the opening of interexchange markets to competition has been told before and need not be repeated here. We simply note that, although it was changes in FCC policy that initially opened the market to competition, 31/ in more recent periods it has been competition that has driven the actions the Commission has taken. In particular, the advent of interexchange competition has rendered the historical method for recovering NTS costs unworkable and necessitated creation of an alternative method to cover these costs.

Another important change is the FCC's decision to preempt state control over depreciation for intrastate ratemaking and prescribe more rapid rates of depreciation for telephone plant and equipment. 32/ The time horizon implicit in the arguments of those who criticize more rapid depreciation guidelines solely on the basis of their impact on price, and hence possibly universal service, is too short, at least on a forward looking basis. 33/ The selection of a depreciation period should attempt to minimize costs over an extended period, not just the current period. While the reasons why regulatory commissions prefer to depreciate investments over extended periods are easily understood from a political perspective, such policies will hurt consumers if the useful economic lives of these investments are shorter -- for whatever

31/ The case usually cited in support of this proposition is the so-called Above-890 Decision. "In the Matter of Allocation of Frequencies in The Bands Above 890 Mc.," Report and Order, 27 FCC 359 (July 1959).

32/ Amendment of Part 31 (CC Docket No. 79-105), 89 FCC 2d 1094 (1982), recon. 92 FCC 2d 864 (1983), review pending sub nom. Virginia State Corporation v. FCC, No. 83-1136 (4th Cir., filed February 11, 1983).

33/ Telephone companies are legally entitled to recover their historical costs. Whether book costs exceed true economic costs and whether companies would, in a competitive environment, be required to write off rather than try to recover these costs are issues subject to dispute.

the useful economic lives of these investments are shorter -- for whatever reason.

Depreciation is a real cost of doing business, and as such, must be recovered by a company if it is to stay in business. Investors will find a company an unattractive investment if it fails to cover these costs, whether due to bad management or regulatory disabilities. The ultimate result of inadequate depreciation will be an inability to replace old or obsolescent facilities with newer, technologically up-to-date equipment. That result, while possibly permitting lower prices in the short term, will threaten the continued availability of high quality service. Because it thwarts the introduction of new technologies, it may actually result in future prices to consumers that are well above what would have been possible under more enlightened procedures. In short, excessively long depreciation schedules only seem to promote consumer welfare by keeping prices low, but they imply higher prices and poorer service in the future. 34/

B. Effects on Costs

Staff of the FCC's Common Carrier Bureau has sought to estimate the general magnitude of the price changes associated with recent federal regulatory decisions. 35/ In addition to imposition of access charges and more rapid rates of capital depreciation, the Staff also considered the effects of changes in the accounting for costs incurred in the provision of

34/ That depreciation rates were excessively long in at least one instance is suggested by ATT's write-off of a substantial portion of its CPE assets in late 1983. In economic terms they were simply not worth their book value.

35/ See FCC, Common Carrier Bureau (1983).

embedded and new station connections, the decision to phase CPE revenue requirements out of the interstate jurisdiction, the detariffing of embedded CPE and its transfer to AT&T, Joint Board recommendations regarding changes in the separations manual and growth in the proportion of inter- and intra-state toll usage relative to total telephone usage. ^{36/} Mandated changes in depreciation, CPE decisions, separations changes and imposition of access charges all increase revenue requirements, while changes in the regulation of station connections and the effects of a shift toward toll service reduce them.

The FCC Staff's estimate of the cumulative monthly increase in residential telephone exchange bills associated with these changes is \$4.22 in 1984 growing to \$8.28 by 1989. This represents a compound average annual growth rate for residential telephone exchange bills of about 7 percent from 1983 to 1989. To place this figure in context, recall that the real price of telephone service has been falling steadily over time. Using constant 1972 dollars, the relative price of service actually declined from \$8.17 in 1960 to \$4.69 in 1981. Only one category of consumption goods had a smaller nominal increase than telephone service during the inflationary 1970's and early 1980's (womens' clothing). While the consumer price index more than doubled over this period, telephone service prices rose only 30 percent. The price increases implied by recent federal actions thus do little more than "catch-up" with inflation, if indeed they even do that. When they are put in this perspective, it is difficult to believe that they are likely to do any

^{36/} A summary of policy decisions is given in Attachment 9 to the FCC Staff Study. FCC (1983).

significant damage. Note especially that in 1970 telephone penetration nationwide already exceeded 90 percent. 37/

When price increases of the magnitude estimated by the FCC Staff are combined with (upwardly biased) demand elasticity estimates close to zero, the result is obviously a negligible effect on the overall level of telephone subscribership. This conclusion is strengthened by recognition that other factors will be simultaneously operating to increase demand for telephone service. The elasticity of demand for a product depends on the availability of substitutes. Demand for a product will be more inelastic the fewer the substitutes there are for it. As already discussed, the measured inelasticity of demand for telephone service indicates an absence of close substitutes for such service. This implies that when prices rise, people will, in fact, have no good alternative to paying the higher prices. Thus, we conclude concerns over rising prices per se rather than threats to universal service are what principally motivate opposition to rate reform.

It is likely that few customers affected by the new policies will drop off the network, but customers who use long-distance service infrequently even at the new lower rates will probably face higher bills. If this is a problem, it is primarily one of income distribution from light to heavy long distance users. Fear that unlimited local calling (at subsidized prices) may disappear is another concern. The availability of lifeline or other "barebones" services specifically designed to protect universality does not really assuage these concerns. The issues here are essentially distributional in nature and have only a very little to do with possible threats to universal telephone service in the United States.

37/ We wish to be clear about the point we are making here. It is that the price increases contemplated in the access charge and other orders do not threaten universal service, not that telephone (or any other specific commodity) prices should track the general movements of prices.

V. Policy Issues

A. Effects of Competition

The procompetitive policies for telecommunications that have been developing at the FCC and elsewhere in government over the past decade have been undertaken to increase the economic welfare of consumers. Recent discussion in Congress and among state authorities has focused almost exclusively on costs--and primarily on redistribution of existing costs, some of which might not even be classified as costs in economic terms. 38/ Reorganization of the telephone system along more competitive lines will not be costless, but there are reasons to believe that it will generate nonnegligible benefits for consumers.

Prices that reflect costs allow people to make choices in accordance with the costs they actually impose on society in terms of alternative resource uses foregone and the benefits they expect to receive. That promotes maximization of the economic benefits obtainable from use of society's scarce resources and is the basis for the United States' national market-competition policy. Telecommunications was long exempt from that policy because it was supposed that economies of single-entity organization dictated a regulated monopoly industry structure. The judgment has now been made, at least implicitly, that those economies are insufficient or their existence insufficiently tested to warrant maintenance of the old structure. Dynamic

38/ In economic terms the real cost of any good is the value of what must be sacrificed in order to obtain it. The cost of a decision is the opportunities foregone if the decision is made. Costs that have already been incurred cannot be affected by present decisions; they are sunk costs, and hence irrelevant to decisionmaking.

inefficiencies such as slowness in innovating or in reacting to changes in demand thought likely to characterize the old structure's prospective performance have been judged to outweigh efficiencies of single-entity organization. That the benefits of dynamic efficiency under competition will actually prove to be greater than forgone efficiencies of scale and integration, of course, remains to be seen.

There is some recent direct evidence illustrating how competition affects telecommunications users. Deregulation of customer-premise equipment and the competition that has grown in its wake have brought benefits in the form of lower equipment costs and a wider variety of qualities and service features from which to select. A monopoly provider might have been able to offer these options to consumers, but under monopoly new products were, in fact, slow in coming and both new and old products were high in price. ^{39/} The speed with which consumers are shifting to non-telephone company equipment is powerful evidence of the benefits a free market can provide and completely consistent with what we know to be true about competition's generally salutary effects in the rest of the economy. ^{40/}

Long-distance provides another example -- still developing. The growth rates of the "other" common carriers and resellers illustrate the advantages many consumers attribute to lower priced alternatives. Current pricing practices substantially overcharge for long-distance service -- particularly AT&T services. That means that not only must consumers pay a large premium for the long-distance calls they do make, the premium itself leads them to forego benefits they would obtain from the greater utilization of long-distance

^{39/} See Brock (1981), Chapter 9, pp. 234-253.

^{40/} See "The Big-and Bruising-Business of Selling Telephones", Business Week, March 12, 1984, pp. 103-106.

service that would occur under cost-based pricing. Estimates of the deadweight economic welfare losses attributable to current inefficient pricing practices are enormous. 41/

The uses for and benefits to be derived from increased use of long distance go far beyond personal calls, important as these are. Professionals in many fields now rely extensively upon information made available by low-cost long-distance telecommunications. Medical doctors can call up services such as "Medline" and "Colleague" to obtain state-of-the-art diagnostic information and the most recent research. The legal reference service called "Lexis" provides the same kind of information for lawyers. Architects, engineers and professionals of all kinds are using long-distance communications to acquire information that enables them to supply better service at lower cost. The computer revolution is another source of greatly increased demand for telecommunications services, especially long distance. Credit card companies, airline reservation systems and hotel/motel chains all use telecommunications-linked computer facilities to benefit consumers by reducing market transaction costs.

As long-distance rates fall, these service benefits can be made available on an increasingly widespread basis, including, in particular, to those people who live in rural areas and who are allegedly harmed by more efficient pricing of telephone services. 42/ We believe, to summarize, that there are important benefits to be obtained from promotion of competition in telecommunications.

41/ In addition to the Griffen study cited earlier, Wharton Econometric Forecasting Associates (1983) recently sought to estimate the macroeconomic impact of reforming current inefficient pricing practices. They estimate average gains on the order of \$9 billion per year during the 1984-1988 period.

42/ Costs of providing exchange access may be higher in rural areas, but so too are the benefits of lower prices for long-distance calling.

B. Efficient Pricing and Network Bypass

Economic theory provides guidance about the best (i.e., economic welfare-maximizing) method for covering the cost of telephone service. 43/ Cost should be covered by pricing services above their marginal costs in inverse proportion to the elasticities of demand for the services. 44/ Since access costs are relatively insensitive to actual usage and since demand for access to exchange facilities is less elastic than demand for usage, it is efficient to cover costs through flat fees for access and usage-sensitive charges that closely reflect marginal costs of usage along different output dimensions (distance, length, time of day). 45/ The FCC's access charge order would substitute flat access charges to recover nontraffic-sensitive costs for a system that attempts to recover those costs through usage-sensitive charges that greatly exceed marginal costs. The FCC's proposal is thus a move toward more efficient pricing.

Those who oppose economically efficient pricing generally fail to recognize that failure to price efficiently will make most users worse off. Socking it to the big guys always sounds good to the little guys until it is pointed out that attempting to sock it to the big guys will end up costing the

43/ See William J. Baumol and David F. Bradford (1970).

44/ This assumes no lump-sum taxes are permitted and that cross-elasticities of demand among different services are zero. If the relevant cross-elasticities are nonzero, the inverse elasticity rule is not applicable, but an analogous rule may be derived. See Baumol and Bradford (1970, pp. 266-267).

45/ The term "efficiency" is used here in its technical economic sense; that is, a pricing mechanism is efficient if it maximizes consumer welfare, given the initial distribution of income.

little guys even more. Higher business telecommunications costs are passed along to consumers in the form of higher prices for the goods and services consumers purchase. The notion that costs can somehow be shifted from consumers to producers is false. Consumers bear all the costs of telephone service. The issue is whether costs should be borne by those who cause them to be incurred (either directly or indirectly) or whether they should be redistributed so that lower prices for some telephone services and some users are paid for by higher prices for virtually everything and everyone else.

The ubiquitous deadweight welfare losses inefficient pricing inflicts upon consumers have been previously described. 46/ Inefficient pricing also causes productive inefficiency (resource waste). In the telephone industry "bypass" is the "byword" on this topic. Bypass means nothing more than use of apparently less costly substitute services to avoid use of the basic regulated phone system. The concentration of telephone use is very high, with about two percent of all business customers accounting for 79 percent of telephone company business revenues. 47/ In these circumstances the actuality of even a few customers taking a significant fraction of their business elsewhere will have adverse cost consequences for customers remaining on the network. The irony is that much of the presently planned and current bypass would not occur if long-distance services were priced efficiently. In the name of protecting consumers, and, purportedly, universal service, the current surcharge/subsidy scheme constitutes the main threat to consumers and universal service. Unless draconian measures are taken, large businesses will find cost-effective ways of satisfying their communications needs. That is good for consumers who

46/ Supra, p. 17.

47/ See M. Tannenbaum (1983). Of course, not all of this traffic is vulnerable to bypass technologies.

purchase the products of businesses that are able to reduce their costs by bypassing the public switched network, but may be wasteful from an economy-wide perspective if motivated by artificially high prices rather than real cost savings.

Congress perceives that bypass is the real threat to universal service, but instead of deterring uneconomic bypass by confronting decisionmakers with prices that accurately reflect costs, some members of Congress propose to tax bypass technologies. On the one hand, that solution will not work given sufficiently large loopholes in the tax proposal. 48/ On the other hand, if the solution "works," then we are really in trouble. Technical advance is the primary reason we have low-cost, high-quality, widely available telephone service. Technical advance does not occur in a vacuum. The extent and direction of technological progress reflect prior investments in research and development, which in turn reflect the structure of incentives embedded in market prices. 49/ Technical advance is like any other good--make it more expensive and people will demand less of it; reduce the reward to investments in new technology and people will invest less in the activity. Congress in essence proposes to preserve universal service by killing the goose that figuratively laid the golden egg. As Leland Johnson (1983, p. 50) has remarked:

Such a clear-cut case of penalizing the development of new and lower-cost technologies raises major issues of national economic policy.

48/ See the comments of the FCC in its letters to Senator Goldwater on S. 1660 (October 31, 1983) and to Representatives Broyhill and Ritter on H.R. 4102 and H.R. 4285 (December 5, 1983).

49/ See Nina W. Cornell et. al. (1980).

C. Equity Considerations

Alfred Kahn (1982, p. 7) has observed that:

Clearly there are possible areas of public policy in which conceptions of fairness may conflict with economic efficiency. But it is by far the greater wisdom to recognize that, for the most part, the major departures from economic efficiency in our public policies today are also demonstrably unfair; and that, for the most part, movement in the direction of economic efficiency is also compatible with increased fairness. It is fair, as a general proposition, to impose costs on people insofar as they impose costs on society.

While the FCC's access charge plan is a "movement in the direction of economic efficiency" and attempts "to impose costs on people insofar as they impose costs on society," some have nevertheless claimed that the plan is inequitable. Their argument is premised on the observation that since users differ in income, a flat fee constitutes a larger percentage of income for the poor compared to the rich and is thus regressive, as is any lump sum tax. 50/ Note that on this view all prices not scaled to income differences are regressive. Any price represents a larger proportion of a low income than a high one. Consumers may also differ in their use of the service, so that even if everyone had equal incomes, there would still be an equity problem because consumers who use the service more face a lower average charge, the flat fee being spread over a larger number of units. 51/

50/ For a simple analysis, see Steven T. Call and William L. Holahan (1983, p. 445).

51/ The principle has been given humorous expression by Calvin Trillin (1983), who notes that "I bought my tuxedo in 1954, when I was a thrifty young undergraduate, because I had added up the number of black-tie events I would have to attend during college, divided the cost of a tuxedo by that number and concluded that I would be better off buying a tuxedo than renting one... As it turned out, there have been a number of occasions to wear the tuxedo since graduation... and every time I wear it the cost per wearing decreases. This New Year's Eve, for instance, wearing my tuxedo is going to cost me only about 48 cents..."

Consider the application of such equity principles to the consumption of automotive services. They imply that these services are inequitably priced because per-unit costs are higher for an individual who does little driving compared to an individual with the same car who drives a lot. Similarly, automobiles are inequitably priced because their prices constitute a larger percentage of income for a person with a small income compared to an individual with a large income. It has been suggested that it is unfair for a person who makes no long distance calls to have to pay a long-distance access charge. This is analogous to arguing that people who do not drive their cars long distances should not have to pay the full cost of their cars. Of course, application of the same principle also implies that local unmeasured service is very unfair since average costs for a person who only uses his phone in an emergency are much higher than for a person who talks all day, a conclusion that is not often drawn by the advocates of the current system.

Note that traffic-sensitive automotive costs are higher in some parts of the country than in others. In the North, for example, snow tires are often needed for winter driving, whereas in the South they are not. Should people in the South therefore be compelled to subsidize snow-tire purchases by Northerners? If they are so compelled, one thing we can be sure of is that many more Yankee autos will be equipped with snow tires. Of course if Southerners must subsidize Northerners because the North is cold, "equity" demands that Northerners be compelled to subsidize Southerners because the South is hot!

D. The Question of Subsidies

The facts strongly suggest that access charges will on average have a very small effect on telephone penetration rates. Obviously no one is an average individual or lives in the average place. Costs of providing access tend to be higher in rural as compared with urban areas. ^{52/} Some have sought to use these cost differences to justify a policy of geographic cross-subsidization and the FCC itself proposes a fund to subsidize high-cost areas. Cost differences provide an exceedingly weak basis on which to justify subsidies. There are innumerable "cost" differences between urban and rural areas. To focus on one good and to argue that a subsidy is justified because that particular good is more costly in one area than another is extremely myopic. The air tends to be cleaner in the country. Does that mean that citizens of rural states should be compelled to subsidize New Jerseyans because of the high cost of clean air in the Garden State?

The FCC has proposed creation of a universal service fund to reduce geographic cost disparities, but as with any proposal for a subsidy there are some adverse side effects which are hard to avoid. First, the fund is to be raised by a surcharge on long-distance service, the same way the current subsidy is raised. It is thus subject to all the criticisms of the current system, albeit on a smaller scale. Second, the FCC proposal would target aid to high-cost areas. Necessarily, this will lead to perverse incentive effects for economic efficiency. Although it may well be the case that some of the higher costs of rural telephone companies are due to irremediable geographic factors, targeting aid to high-cost areas discourages cost control, whether

^{52/} This is not always the case. For example, in urban areas where new conduit is required, costs can be very high indeed.

through efficient management or use of cost-minimizing technologies, including substitutes for conventional telephone such as radio. Third and most importantly, the proposed system of subsidies is targeted to high cost areas rather than low-income households. The research we have reviewed in this paper suggests strongly that the threat to universal service, if there is one, is that low-income consumers will be forced off the system, not that consumers in high-cost areas will have to pay higher prices. The transfers contemplated in the proposed universal service fund (not to mention the current system) are not as closely tied to recipients' incomes as might be desirable. What has become of fairness when, for example, long distance callers in Maine-- including the poor and the elderly--subsidize the phone service of those who have recently retired to Florida? These inter-regional transfers have not gone unnoticed in New Jersey, Illinois or Maine. 53/

Intergenerational transfers are just as hard to justify as geographic ones. Interest groups which purport to represent the elderly claim that older people who rely on the telephone primarily for security and health reasons will be driven off the system by access charges. The elderly actually have a significantly less elastic demand for telephone service than the population at large and thus are among the least likely to drop off the system if prices rise. 54/ To argue that the elderly are harmed by access charges ignores that the elderly do slightly more than the average amount of long distance calling

53/ See the comments of their telephone companies and state public utility commissions on subsidies to encourage universal service in the Joint Board proceeding. (CC Docket 80-286.).

54/ See Lewis J. Perl (1983).

and would presumably do even more if the price were lower. ^{55/} Many elderly people are separated from their families and friends by long distances and would benefit from the FCC's access charge plan by being able to make and receive a greater number of long-distance calls of longer duration.

There are elderly people who are poor, to be sure, but it is their indigence rather than their age which argues for their support. Why support for the poor should take the form of below-cost telephone service rather than dollars is not clear. That adverse effects on the poor justify keeping the price to everyone below cost is bewilderingly naive, but as Bastiat noted long ago, "the state is the great fictitious entity by which everybody seeks to live at the expense of everyone else." Unless you are prepared to argue that everyone's food, fuel and television set bills should be subsidized (by whom?) because higher food, fuel and TV prices hurt the poor, you cannot convincingly argue against access charges on these grounds.

A universally available subsidy such as we have currently built into the basic system of charges to all consumers, is an excessively costly and ultimately infeasible way of meeting the legitimate needs of those few whose access to telephone service might be threatened by cost-based pricing. It is excessively costly because to maintain it will require forgoing the benefits of competition and technical advance. It is ultimately infeasible because eventually the subsidy-providing users, especially major users, will find ways of escaping the system.

^{55/} See the toll usage study by Susan J. Devlin and I. Lester Patterson in Belinda Brandon (1981).

Subsidies, if deemed necessary, should meet two criteria. First, they should be raised in as nondistorting a way as possible, 56/ not through general tax revenues (the ideal) than perhaps by an addition to customer access line charges. Second, financial payments or lifeline rates should be made available to those who need them, not to everyone. The difficulty of identifying those who should be eligible for subsidies--whatever form they take--is often magnified unduly by those opposed to targeted programs. We believe it would be both fairer and far less expensive to formulate a program aimed at low-income individuals rather than high-cost areas.

56/ All taxes or similar subsidy sources involve some distortion - in the sense that the tax leads consumers to choose among goods and activities in a different way than they would in the absence of the tax. A tax is relatively non-distorting to the extent it leaves relative choices unchanged. Lump sum wealth taxes such as head taxes come closest to meeting this criterion. Excise taxes, or their equivalent, are highly distortionary. An extra per minute charge on long distance calls acts like an excise tax.

VI. Summary

Consumers pay all the costs of providing telephone service. That is true now and it will be true if the FCC's access charge plan or any other pricing scheme is implemented. Under current practice below-cost prices for local telephone service are paid for by above-cost prices for long-distance service and for all other goods and services whose production and distribution entail use of long-distance service. That implies that when someone promises to keep the price of local telephone service from rising, he is also promising to keep the prices of long-distance and other goods and services from falling. It also implies that a person who makes no long-distance calls is not necessarily being subsidized under the current system, for the overcharges on all other goods and services consumed may more than offset the difference between the actual cost of access and the price actually paid.

Because consumption varies with income, it is probably true that there is an income redistribution from higher to lower income consumers occurring under the current system. That redistribution occurs because surcharges are embodied in the prices of virtually all goods and services and higher income individuals, up to a point, purchase more goods and services. Note, however, that these redistributive benefits are currently being produced in an extremely inefficient way (not to mention their being "bestowed" quite arbitrarily). 57/ The same benefits could be provided to needy individuals at far less cost or, alternatively, much larger benefits could be provided if

57/ As Kahn (1982, p. 8) argues, "There are consumers who want to make a lot of calls in an extended area at no extra charge, and there are others who happen to live in the country, or on the borders of local calling areas, whose equally short-distance calls are subject to inflated toll rates: to imply that the interest of both of these would be similarly adversely affected by a more efficient pricing system is ridiculous."

subsidization were more effectively rationalized. Moreover, as has been widely remarked, the current system of subsidies will become increasingly unsustainable given the spread of competition.

The evidence that is available on the demand for access, coupled with what we know about the likely magnitude of cost increases, indicates that threats to universal service are minimal or nonexistent. Should any problems arise, there are a variety of ways of handling them that are consistent with the basic thrust of the FCC's pro-competitive decisions. We conclude that proposals to roll back or substantially alter the thrust of the FCC's access charge plan are ill advised in general and cannot be justified as legitimate responses to universal service threats in particular.

References

- Alleman, J.H., "The Pricing of Local Telephone Service," U.S. Department of Commerce, Office of Telecommunications, OT 77-14 (April 1977).
- Artle, Roland and Christian Averous, "The Telephone System as a Public Good: Static and Dynamic Aspects," Bell Journal of Economics and Management Science (Spring 1973).
- Baumol, William J. and David F. Bradford, "Optimal Departures from Marginal Cost Pricing," American Economic Review (June 1970).
- Bowman, Gary W. and Wayne A. Morra, "Demand for Access and Use of the Telephone Network: A Critical Review of Literature," Report to GTE Service Corp., submitted in CC Docket No. 83-788 by the Iowa State Commerce Commission (1983).
- Brandon, Belinda (ed.), The Effect of the Demographics of Individual Households on Their Telephone Usage (1981).
- Brock, Gerald W., The Telecommunications Industry, The Dynamics of Market Structure, Harvard, 1981.
- Call, Steven T. and William L. Holahan, Microeconomics (1983).
- Carr, Michael T., Testimony Before the Public Service Commission of the State of New York on behalf of Rochester Telephone Co., submitted in CC Docket No. 83-788 by the New York Department of Public Services (1983).
- Charles River Associates, "The Demand for Local Telephone Services Upon the Introduction of Optional Local Measured Service (IMS)," prepared for Southern New England Telephone Co., submitted in CC Docket No. 83-788 by the State of Connecticut Department of Public Utility Control (1983).
- Christensen, Laurits R., Direct Testimony on Behalf of Michigan Bell Telephone Company, Before the Michigan Public Service Commission, submitted in CC Docket No. 83-788 (1983).
- Cornell, Nina W., Daniel Kelley and Peter R. Greenhalgh, "Social Objectives and Competition in Common Carrier Communications: Incompatible or Inseparable?," Federal Communications Commission, Office of Plans and Policy, Working Paper No. 1 (April 1980).
- Data Resources, Inc., "Critique of Service Demand and Cost Models Developed by the Southern New England Telephone Company," submitted in CC Docket No. 83-788 by the State of Connecticut Department of Public Utility Control (1983).
- Davis, B.E., G.J. Caccappolo and M.A. Chaudry, "An Econometric Planning Model for American Telephone and Telegraph Company," Bell Journal of Economics and Management Science (Spring 1973).

Devlin, Susan J. and I. Lester Patterson, "Toll Usage" in Linda Brandon, (ed.), The Effect of the Demographics of Individual Households on their Telephone Usage (1981).

Doherty, A. Noel, Testimony Before the Public Service Commission of the State of New York on behalf of New York Telephone Co., submitted in CC Docket No. 83-788 by the New York Department of Public Services (1983).

Egan, Bruce L., Testimony Before the Arkansas Public Service Commission, and Testimony before the Public Service Commission, State of Missouri, submitted in CC Docket No. 83-788 by Southwestern Bell.

FCC, Common Carrier Bureau, "Analysis of the Effects of Federal Decisions on Local Telephone Service", A Report after Inquiry in CC Docket No. 83-788, December 9, 1983.

Feldman, J. "A Preliminary Cross Sectional Analysis of Services," unpublished paper (1976).

Friedman, Milton, "The Methodology of Positive Economics," in Readings in Microeconomics, William Breit and Harold Hochman (eds.) (1971).

Gearity, Gail A., Testimony Before the Tennessee Public Service Commission, on behalf of United Inter-Mountain Telephone Company, submitted in CC Docket No. 83-788 by the Tennessee Public Service Commission (1983).

Gearity, Gail A., Testimony Before the Virginia State Corporation Commission, on behalf of United Inter-Mountain Telephone Company, submitted in CC Docket No. 83-788 by the Virginia Public Service Commission (1983).

Griffen, James M., "The Welfare Implications of Externalities and Price Elasticities for Telecommunications Pricing," Review of Economics and Statistics (February 1982).

Heidt, P., "New England Telephone Residence Basic Service Demand," unpublished paper (1979).

Hirshleifer, Jack, Price Theory and Applications, 2d ed., Prentice Hall, 1980.

Johnson, Leland L., "Why Local Rates Are Rising," Regulation (July/August 1983).

Kahn, Alfred E., "Some Thoughts on Telephone Access Pricing," National Economic Research Associates Reprint (1983).

Littlechild, S.C., Elements of Telecommunications Economics (1979).

Mahan, Gary P., "The Demand for Residential Telephone Service," Michigan State University Public Utilities Papers (1979).

Miller, Richard C., Direct Testimony on Behalf of Michigan Bell Telephone Company before the Michigan Public Service Commission (1983).

- Mitchell, Bridger M., "Pricing Subscriber Access to the Telephone Network," Paper Presented at the Workshop for Local Access: Strategies for Public Policy, St. Louis, September 14-17, 1982 (mimeo.).
- Musgrave, Richard A., The Theory of Public Finance, International Student Edition, McGraw-Hill, 1959
- Oveson, Richard M., "Telephone Usage in Utah: A Consideration of Alternative Offerings," submitted in CC Docket No. 83-788 by Mountain Bell, Northwestern Bell and Pacific Northwest Bell (1983).
- Perl, Lewis J., "Economic and Demographic Determinations of Residential Demand for Basic Telephone Service" National Economic Research Associates (March 28, 1978).
- Perl, Lewis J., "Residential Demand for Telephone Service: Preliminary Results of a New Model," Paper Prepared for The Central Services Organization, Inc. of the Bell Operating Companies by National Economic Research Associates, Inc., (December 16, 1983).
- Preece, Robert, "A Club-Theoretic Approach to Telephone Access Externalities," Unpublished Paper (1983).
- Reinking, Richard D., "Access Price Elasticity," submitted to CC Docket No. 83-788 by the Arizona Corporation Commission (1983).
- Rohlf, Jeffrey, "Economically Efficient Bell System Pricing," Bell Laboratory Discussion Paper No. 138 (January 1979).
- Squire, Lyn "Some Aspects of Optimal Pricing for Telecommunications," Bell Journal of Economics and Management Science (Autumn 1973).
- Tannenbaum, M., Address before NARUC Convention and Regulatory Symposium, Detroit, Michigan (November 17, 1983).
- Taylor, Lester D., Telecommunications Demand: A Survey and Critique (1980a).
- Taylor, Lester D., "The Demand for Telecommunications: A Nontechnical Exposition", in Michael A. Crew, (ed.), Issues in Public-Utility Pricing and Regulation, Lexington (1980b).
- Trillin, Calvin, "Wearing My Tax Costs Just 48¢ a Bash," Washington Post (December 25, 1983).
- von Auw, Alvin, Heritage and Destiny (1983).
- Wharton Econometric Forecasting Associates, Impact of the FCC Access Charge Plan on the U.S. Economy (1983).

