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An Economic Analysis of the FCC's Notice of Inquiry on Flat Rate Charges in the Long Distance Industry

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An Economic Analysis of the FCC's Notice of Inquiry on Flat Rate Charges in the Long Distance Industry

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Abstract. On July 20, 1999, the Federal Communications Commission released a Notice of Inquiry (NOI) seeking comment "on the impact of certain flat-rated charges on single-line residential and business customers who make few, or no, interstate long-distance calls (¶1)." These "flat-rated charges are attributable to universal service and access charge reform (¶1)" that the Commission implemented in January of 1998. The purpose of this reform, as indicated by the Commission, was "to phase in an economically rational common line rate structure … and to reduce the support burden on high-volume long-distance and business customers (¶1)." Although the Commission lists its "primary focus" as being on the consequence of its own policy reforms, it also inquired about the impact on consumers of flat monthly account maintenance fees charged by some interexchange carriers (IXCs) to customers with zero or low usage.

This Policy Paper shows that if the goals of Access Reform, both specifically and generally, are to be accomplished, it is necessary that the pricing structure of access services and long distance rates consist of both fixed monthly fees and usage charges. Such cost-causative, two-part pricing structures are consistent with both the stated intent of the Commission's Access Order and the general economic principles of efficient pricing. The Commission's intention to eliminate the implicit subsidies created by the pre-Reform access pricing structure will, by necessity, force some consumers to pay more. Specifically, previously subsidized consumers will pay more while previously subsidizing consumers

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will pay less. This consequence of Access Reform was expected, indeed inevitable, and is no cause for alarm. Any attempt to regulate away intended consequences is particularly undesirable.

In addition, this Policy Paper provides some evidence on the relationship between usage and income. This evidence indicates that while usage and income are positively correlated, the correlation is weak. Furthermore, low usage (the focus of the NOI) is found to be common at all income levels suggesting that the recent changes in the industry are not excessively burdensome to households of a particular income level. Thus, Access Reform would appear to be fairly innocuous on fairness grounds.

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Although competition can bear some admixture of regulation, it cannot be combined with planning to any extent we like without ceasing to operate as an effective guide to production. [P]lanning and competition can be combined only by planning for competition but not by planning against competition.

– F.A. Hayek, The Road to Serfdom (1994 ed., at 48).

I. Introduction

On July 20, 1999, the Federal Communications Commission released a Notice of Inquiry (NOI)[1] seeking comment "on the impact of certain flat-rated charges on

[1] *Readers' note:* A "notice of inquiry" (NOI) – unlike a notice of proposed rulemaking (NPRM) – has no rulemaking implications or effects. Instead, as its name implies, it is a (Footnote Continued. . . .)

single-line residential and business customers who make few, or no, interstate long-distance calls."[2] These "flat-rated charges are attributable to universal service and access charge reform"[3] that the Commission implemented in January of 1998. The purpose of this reform, as indicated by the Commission, was "to phase in an economically rational common line rate structure … and to reduce the support burden on high-volume long-distance and business customers."[4] Although the Commission lists its "primary focus" as being on the consequence of its own policy reforms, it also inquired about the impact on consumers of flat monthly account maintenance fees charged by some interexchange carriers (IXCs) to customers with zero or low usage.

The Commission's interest in low-volume long distance users stems from its desire to "ensure that all Americans benefit from a robust and competitive communications marketplace."[5] Prior to implementation of Access Reform, flat charges for long distance services were atypical and consumers had grown accustom to usage based pricing alone. Because a change from usage only pricing to usage pricing plus a flat monthly fee (two-part pricing) may increase the monthly charges for low-usage customers -- and unambiguously increase monthly charges for zero usage -- the Commission is concerned that its access reforms will not benefit low-volume users of long distance service.

The Commission's desire to see "all Americans benefit from a robust and competitive communications marketplace" has little to do with the recent changes in local and long distance prices that are the subject of its NOI. The distributional consequences of Access Reform will (likely) be very different from those of increased competition in telecommunications markets. Moving from pure monopoly to a competitive market would be expected to benefit all consumers, but altering the price structure of a regulated monopoly with the intent to eliminate subsidies would not. Furthermore, while regulated monopoly is fertile

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mechanism used by an administrative agency to help inform its decision-making as to whether, at some time in the future, it is appropriate to initiate a formal rulemaking or adjudicative proceeding. At the time of this Policy Paper, however, the FCC has taken no further action on the NOI discussed herein.

2 *In the Matter of Low-Volume Long-Distance Users*, Notice of Inquiry, FCC No. 99-168, __ FCC Rcd __ (rel. July 20, 1999) at ¶1 (hereinafter the "NOI").

3 *Id.*

4 *Id.*

5 *Id.*

ground for politically desirable subsidies, competitive markets are not. In the subsidy-rich local exchange telecommunications market, it will be nearly impossible to alter the status quo, even in the direction of increased competition, without some consumers paying more.

Indeed, the Commission fully understood that its Access Reform would benefit "most" but not "all" consumers ["the Commission believed that … *most* consumers would enjoy benefits in the form of lower long-distance rates, and that those benefits would outweigh the burden of a small, flat monthly charge"].[6] Increased expenditures by some consumers -- in particular zero and low-usage consumers -- was necessary to achieve the goals of the reform and, as such, is no cause for alarm. Alternatively, a thoughtful review of Access Reform may be desirable if the intended consequences of the reform have the unintended consequence of being excessively burdensome to the nation's poorer households. This issue, among others, is considered in this report.

The conclusions of this report can be summarized as follows. First, if the Commission intends to accomplish the stated goals of Access Reform, then the Commission must embrace two-part pricing and the consequences of such pricing on low-usage consumers. Two-part pricing for local and long distance service is the only way by which to ensure economically efficient pricing and eliminate implicit subsidies in the local and long distance telecommunications industries.[7] Furthermore, because of the nature of costs in the telecommunications industry, a move to two-part pricing is an inevitable consequence of more competitive telecommunications markets. If the Commission were to stand-in for competition as a welfare maximizing social planner, the result would be the same. In general, cost-causative prices are welfare maximizing and this holds (in many cases) even if the welfare of low-usage consumers is weighted more heavily than high-usage consumers and if network and call externalities are present.

Second, evidence presented in this report indicates that Access Reform and the recent developments in the competitive long distance industry do not solely benefit high-income consumers, but also benefit the nation's poor. Some consumers, no doubt, will pay more under two-part pricing. Paying more is not a consequence of income, however, but of usage and low-usage is nearly as common at high incomes as it is at low incomes. Furthermore, when coupled with

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[6] NOI at ¶10 (emphasis added).

[7] The focus of this report is on the correct structure of access charges. A separate issue is the level of access charges, an issue that has significant welfare implications.

numerous private and public programs for low-income consumers, the consequences of Access Reform and the recent developments in the long distance industry are inconsequential on fairness grounds.

II. Background and Framework

Given the nature of costs in the local and long distance industries, two-part pricing (flat fees plus usage fees) has many beneficial features over usage-based pricing. As recognized by the Commission in both its NOI and its earlier Access Order,[8] two-part pricing (a) eliminates "inefficient and undesirable behavior" by making the price structure more "cost-causative" and (b) reduces the "implicit subsidy" from high volume to low volume users. Oddly, one of the benefits of two-part pricing is also its most undesirable property. By reducing or eliminating "implicit subsidies," two-part pricing requires that some consumers' expenditures rise while others' fall.

A. *Expenditures*

Figure 1 illustrates the expenditure consequences of different price structures on consumers of varying usage levels. Monthly expenditures for a telecommunications service can be written generally as

$$e = r + p \cdot q \tag{1}$$

where e is total expenditures, r is a fixed monthly fee, p is a usage rate charged for each of q units of service consumed. With usage-based pricing, the fixed monthly fee is zero ($r = 0$) and expenditures depend only on the usage price and quantity consumed. Usage based pricing is illustrated in Figure 1 by the line labeled **0X,** the slope of which is p. At zero usage, monthly expenditures are zero ($p \cdot 0 = 0$).

[8] *See In the Matter of Access Charge Reform*, First Report & Order, ___ FCC Rcd ___, FCC 97-158, (rel. May 16, 1997) (hereinafter "Access Order").

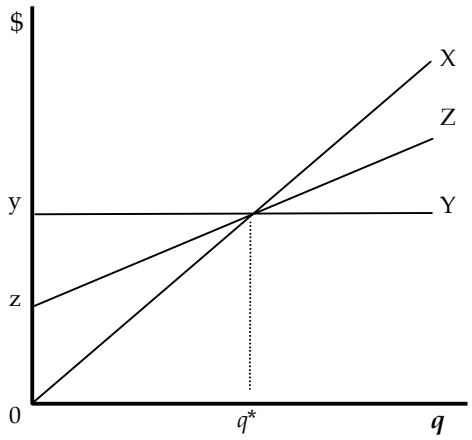

FIGURE 1.

Flat-fee pricing, alternatively, has a usage price of zero ($p = 0$) and monthly expenditures are equal to the flat monthly fee ($e = r$). Expenditures are invariant to the quantity consumed as illustrated by the horizontal line labeled **yY** in Figure 1 where the fixed monthly fee is equal to **y**. In contrast to usage-based and flat-fee pricing, two-part pricing (as defined here) entails both a non-zero monthly fee and usage rate.[9] Line **zZ** in Figure 1 illustrated on two-part pricing plan with a fixed monthly fee of **z**. The usage price is the slope of line **zZ**.

To illustrate the impact of alternative pricing structures and usage on monthly expenditures, the three lines in Figure 1 are drawn such that monthly expenditures are equal for all three pricing structures at quantity q^*. If usage is below q^*, the most expensive price structure is flat-fee pricing (**yY**) and the least expensive is usage-based pricing (**0X**). Alternatively, at quantities exceeding q^* the most expensive pricing is usage-based pricing and the least expensive is flat-fee pricing.

Clearly, for consumers with usage (above) below q^*, a move from usage-based pricing (**0X**) to either two-part (**zZ**) or flat-fee (**yY**) pricing will (decrease) increase monthly expenditures. With two-part pricing, high usage consumers (i.e., above q^*) are compensated for the increase in the fixed monthly fee (from **0** to **z**) by a reduction in the usage rate (holding q constant). Low

[9] Either the fee or usage rate could be negative.

volume consumers (i.e., below q^*) pay the lower usage rate, but their consumption is not large enough to cover the increase in the fixed fee. Of course, the lines could be redrawn (p could be further reduced) such that some consumers below q^* spend less per month (holding q constant). Zero-usage consumers, however, cannot be compensated for the increased fixed fee with lower usage charges. Usage is zero, so monthly expenditures are zero with usage-based pricing and greater than zero with two-part or fixed-fee pricing.

A. *Costs*

Under the "principles of cost-causation" that guided the Commission in its reform of access charges, the desirability of the pricing structure depends on the nature of costs. A naïve view of the costs of providing local access service divides costs into two categories: (a) non-traffic sensitive and (b) traffic sensitive costs.[10] Per customer monthly cost is:

$$c = f + a \cdot q \tag{2}$$

where c is total cost of serving a consumer, f is a fixed monthly cost, a is marginal (or unit) cost for each of q units of service consumed. These alternative cost structures can also be illustrated using Figure 1. With zero fixed costs, the monthly cost of serving a customer is illustrated by the line labeled **0X**. Alternatively, if all costs are fixed in nature, then the monthly cost is **yY**. If both fixed and marginal cost are positive, then the monthly cost is illustrated by line **zZ**.

As recognized by the Commission, "[u]nder principles of cost-causation, it is most economically efficient for incumbent LECs to recover the costs of providing interstate access in the same way that they incur them."[11] Looking back to Equations (1) and (2), the "principles of cost-causation" prescribe that r equal f and p equal a.

Alternately, if all revenues are recovered through the usage price p ($r = 0$), then price must be increased above c to p' so that usage revenues in excess of marginal cost equal the fixed cost f. Raising the usage price reduces quantity from q^* to q'. Because consumer welfare (and social welfare) is maximized when

[10] *See* Access Order at ¶24; NOI at ¶5. The cost of exchange access services includes substantial non-traffic sensitive costs on account of the policy of dividing the costs of the local network between intrastate and interstate jurisdictions.

[11] NOI at ¶5.

price equals marginal cost, deviating from cost-causative pricing creates "inefficient and undesirable economic behavior (NOI, ¶3)" by reducing usage to q'. The lost social welfare caused by the deviation from "cost causative" pricing is equal to the triangular area **SWL** in Figure 2.

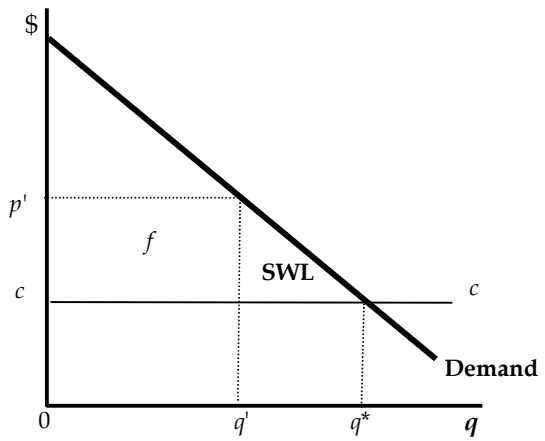

FIGURE 2.

In some cases, a consumer's demand may not be large enough so that increases in p produce sufficient residual revenue to cover f. If the consumer is to receive service, then a subsidy is required. Thus, deviations from cost-causative pricing not only produce social welfare losses, but can also create implicit subsidies. The "implicit subsidy" from high to low usage consumers produced by the pre-Reform access price structure is illustrated in Figure 3. The cost of serving customers with a given usage q is illustrated by the line labeled $c = f + aq$. Under a usage-based pricing, the expenditures of a customer are measured by the line labeled $e = pq$. Observe that expenditures are sufficient to cover costs only if the customer's usage is at least q^* where $q^* = f/(p - a)$. Those customers with usage (below) above q^* spend (less) more for the service than it costs to produce. The implicit subsidy is apparent; the level of p must be set so that the losses from serving customers that consume below q^* (the triangle labeled X) are offset by the profits from serving customers that consume above q^* (the triangle labeled Y): high-volume consumers subsidize low-volume consumers. Eliminating this "implicit subsidy" requires that r equal f and p equal a, a price change that results in increased expenditures for consumers with usage below q^* units and decreased expenditures for consumers with usage above q^*. As long as there are fixed cost f, it is not possible to eliminate the implicit subsidy without some consumers (zero users in particular) paying more.

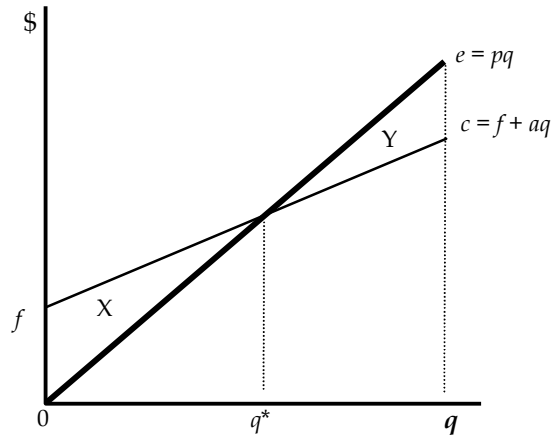

FIGURE 3.

B. *The Dual Goals of Access Reform*

Recall that the Commission's dual goals of Access Reform were to 1) establish an economically rational "cost causative" pricing scheme and 2) reduce the implicit subsidy from high to low usage customers. There is only one way to accomplish these two goals simultaneously. Cost-causation (Goal 1) suggests that r should be set equal to f and p set equal to a. By doing so, the price structure exactly mirrors the cost structure. As long as f is positive, then two-part pricing is preferred to a usage-based pricing even if expenditures for some consumers increase. Elimination of the implicit subsidy (Goal 2) also requires that r should be set equal to f and p set equal to c. By doing so, the expenditures of each consumer exactly match the cost of service and there is no need for a subsidy. Again, to eliminate subsidies, some consumers will pay more while others will pay less.

Critical to the elimination of "inefficient and undesirable behavior" and "implicit subsidies" is that the IXCs flow through the two-part pricing of access charges to consumers in the form of a two-part pricing. The "inefficient and undesirable behavior" caused by the pre-Reform access structure is a consumption issue, and consumption is determined by final goods prices (Access Order, ¶30). Thus, altering access charges that IXCs pay does not provide a remedy; consumers must face the more economically rational price structure as well. Additionally,

exchange access is an input into the production of long distance service and as Ordover and Panzar (1980) show, the two-part pricing of inputs is socially inefficient unless the final goods are priced in the same manner.[12] In fact, if the Commission's Access Reform is to render its intended benefits and not be detrimental to competition, then the Commission should laud, and not condemn, the two-part pricing adopted by the IXCs.

The fact that some consumers will pay more for access services (that are collected by IXCs) does not imply, however, that all consumers will not benefit in some way from the reform. The costs and benefits of Access Reform cannot be measured solely by the short-term changes in monthly expenditures for access and long distance services for certain classes of consumers. Rather, the benefits of the reform will flow from the continued evolution of local competition and elimination of the inefficient allocation of scarce resources in the telecommunications industry. It is the long-run consequences of policy reforms that are relevant. This long-run focus calls for careful selection of and confidence in chosen reforms. Good policy decisions should not be over-ruled at the first stages of an industry's adjustment to rule changes, even if those adjustments do not suit particular interest groups.

A common complaint regarding (the Access Reform induced) two-part pricing in long distance is that zero-usage households are paying for services they do not use.[13] This complaint is incorrect and no doubt a consequence of the Commission's attempt to substitute an increase in the rates paid by the interexchange industry and its customers (via the PICC) for a direct increase in local rates (via the SLC). As the Commission makes clear in its NOI,[14] the PICC is marginal to local phone subscription, not long distance pre-subscription; the only way to avoid paying (a charge to recover the) PICC is to discontinue local service. The IXCs are simply the collection agents for the ILECs. When evaluating remedies for a potential policy problem, it is important to be honest about both the cause and consequence of that problem.

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[12] J. A. Ordover and J. Panzar, *On the Nonexistence of Pareto Superior Outlay Schedules*, BELL JOURNAL OF ECONOMICS, 11: 351-4 (1980).

[13] NOI at ¶4.

[14] *Id.* at ¶16.

II. Cost Causation, Planning, and Competition

Reducing or eliminating social welfare losses is the *raison d'être* of competition. Since deviations of price from cost are the root of such losses, it is unsurprising that cost-causative pricing is entirely consistent with the (naïve) model of perfect competition. Because perfect competition maximizes social welfare, we expect an "all-knowing," welfare-maximizing social planner would choose the same prices as determined in a competitive market. This fact can be illustrated in a straightforward manner.

Let equations (1) and (2) define the revenues and costs for a market of n identical consumers. A welfare maximizing social planner will choose r and p to maximize:

$$\max W = n\int_{p}^{\infty} q(s)ds - r \quad \text{subject to } \pi = 0 \tag{1}$$

where W is consumer welfare and $\pi = (p-a)q(p) + (r-f)$, the profit of the firm.[15] The first order conditions of the Lagrangian optimization problem are

$$\frac{\partial L}{\partial p} = -q(p) + \lambda[q + (p-a)q'] = 0; \tag{2}$$

$$\frac{\partial L}{\partial p} = -1 + \lambda = 0. \tag{3}$$

Solving equation (3) for λ and inserting into equation (2) shows that $p = a$ at the social welfare maximum. Clearly, if $p = a$ and $\pi = 0$, then it must be the case that r equals f. The welfare maximizing social planner chooses cost-causative prices.

Competition has no respect for the desires of social planners.[16] Thus, it is important to compare the competitive outcome to that of the social planner. In this case, the competitive firm chooses r and p subject to the condition that long

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15 Marginal cost is assumed to be constant.

16 This lack of respect is particularly true of real world planners not intent on maximizing social welfare.

run profits are zero. There are an infinite number of r and p combinations that can result in zero profit and these (r, p) combinations make up the iso-profit curve. Likewise, the iso-welfare curve summarizes the relationship between r and p for a fixed level of welfare. The slope of the iso-welfare curve in (p, r) space is

$$\left.\frac{\partial r}{\partial p}\right|_{\Delta W=0} = -q(p) \tag{6}$$

the slope of the iso-profit curve in (p, r) space is

$$\left.\frac{\partial r}{\partial p}\right|_{\Delta \pi=0} = -q\left(1+\eta\frac{p-a}{p}\right) \tag{7}$$

where η is the own-price elasticity of demand. Suppose that the prices chosen by existing competitive firms were such that an entrant could offer a different set of prices that made all consumers better off (a Pareto improvement). Clearly, this initial set of prices would not be a competitive equilibrium since entry will occur and prices will change. Thus, at the zero profit competitive equilibrium it must be true that

$$\left.\frac{\partial r}{\partial p}\right|_{\Delta W=0} = \left.\frac{\partial r}{\partial p}\right|_{\Delta \pi=0} \tag{8}$$

implying that p must equal a and r must equal f. Deviations from cost-causative prices are not sustainable, since Pareto improvements can occur. For example, if price is below marginal cost ($p < a$) then a Pareto improvement can be made by increasing p and reducing r because

$$\left.\frac{\partial r}{\partial p}\right|_{\Delta W=0} > \left.\frac{\partial r}{\partial p}\right|_{\Delta \pi=0}. \tag{9}$$

Alternately, if price is set above marginal cost ($p > a$), then reducing p and increasing r is a Pareto improvement because

$$\left.\frac{\partial r}{\partial p}\right|_{\Delta W=0} < \left.\frac{\partial r}{\partial p}\right|_{\Delta \pi=0}. \tag{10}$$

Thus, the choice of p and r by the social planner is the same as that of the competitive market.[17] There have been a number of academic papers evaluating the social planner's choice of tariffs under a variety of more complex conditions. Richard Schmalensee, for example, considers the choice of prices by a welfare-maximizing social planner who differentially weights consumer and producer surplus.[18] William Sharkey and David Sibley evaluate the social planner's choice of prices when the utility of low volume and high volume users are weighted differently.[19] Michael Einhorn considers optimal tariffs in the presence of call and network externalities.[20] While all of these papers evaluate the tariff selections of "all-knowing" social planners rather than the outcomes of a competitive process, each of these papers shows that two-part pricing is entirely consistent with the choices of the welfare-maximizing social planner.[21]

It is important to keep in mind that as a practical matter neither competition nor regulation is as clean or efficient as mathematics. Decades of economic research on regulation indicates that competition is vastly superior to regulation at improving market performance and maximizing social welfare. As Milton and Rose Friedman acknowledge:

> Perfection is not of this world. There will always be shoddy products, quacks, and con-artists. But on the whole, market competition, when it is permitted to work, protects the consumer

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[17] There may be situations where competitive forces will cause prices to deviate from costs even holding profits at zero. For example, consumers may have strong preferences for flat fees rather than usage charges or there may be strong complementarities between the multiple products a firm sells. Competition, not regulation, is ideally suited to decipher such preferences.

[18] Richard Schmalensee, *Monopolistic Two-Part Tariff Arrangements*, BELL JOURNAL OF ECONOMICS, 12: 445-66 (1981).

[19] Other price structures may be chosen if more than one tariff can be offered. Whatever the tariff structure, low usage consumers will always pay a higher average revenue per minute. William W. Sharkey and David S. Sibley, *Optimal Non-linear Pricing with Regulatory Preference Over Customer Type*, JOURNAL OF PUBLIC ECONOMICS, 50: 197-229 (1993).

[20] Michael A. Einhorn, *Biases in Optimal Pricing with Network Externalities*, REVIEW OF INDUSTRIAL ORGANIZATION, 8: 741-746 (1993).

[21] For a general discussion of these topics, see Bridger Mitchell and Ingo Vogelsang, TELECOMMUNICATIONS PRICING: THEORY AND PRACTICE, Cambridge: Cambridge University Press (1991).

> better than do the alternative government mechanisms that have been increasingly superimposed on the market.[22]

The Telecommunications Act of 1996 clearly recognizes the superiority of competitive forces, calling for increased competition and less regulation.

III. Minimum Charges by IXCs

The Commission's stated desire to see that the "principles of cost-causation" direct pricing decisions certainly would be expected to extend beyond exchange access services (and the recovery thereof) into other telecommunications markets including the long distance industry. Like access services, the cost of serving long distance customers includes both traffic sensitive and non-traffic sensitive costs. Among the largest of traffic sensitive costs are switched access charges. Other traffic sensitive costs may be related to network congestion costs and customer incentive programs such as free airline miles. Examples of costs of a more fixed (per customer) nature include advertising, customer acquisition, billing and collections, customer service, computer systems, administrative expenses, product development, among others. Most of these costs are invariant to the usage of any particular customer, but rise with the total number of customers. Thus, a two-part pricing for long distance service is entirely compatible with Commission's perception of economically rational price structures.

The rather small monthly flat and minimum fees levied by many IXCs today of $3 to $5 remain below reasonable estimates of the fixed cost of serving a customer.[23] For example, one industry analyst estimates that customer acquisition costs are approximately $100 to $150 per customer. Given a customer life of 24 months -- perhaps too long for the long distance industry -- the monthly payment to recover those costs will be $4.16 to $6.26.[24] Publicly available

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[22] FREE TO CHOOSE (Harvest Books 1980) at p. 222.

[23] Minimum usage is slightly different from the two-part pricing structure discussed earlier. In fact, minimum usage is a usage-based pricing structure with a minimum expenditure. If price times quantity is less than the minimum usage amount, then total expenditures equal the minimum usage amount. If price times quantity exceeds the minimum usage amount, then total expenditures equal price times quantity. At any non-zero level of usage, minimum usage fees will always underestimate the contribution of the customer to fixed costs since marginal costs are incurred in the provision of service.

[24] "For Whom, the Bells' Toll?" Bernstein Research, February 1997.

estimates of billing and product development costs alone exceed $3 per month.[25] These few examples of fixed costs show that the fixed fees and minimum usage rates remain below the true fixed cost of serving a customer.

While estimates of the fixed cost per customer can indicate the general level of such costs, in the end it will be competitive forces will decipher whether or not a fixed fee is too low or too high. If one carrier's fixed charges are too high, (marginal) customers simply will migrate to a carrier offering a better deal. Price competition is intense in the long distance industry and information on prices is readily available through a variety of advertising outlets. Long distance carriers are not shy about price comparisons and consumers are not reluctant to switch. Thus, there is no need for the Commission to micromanage pricing in the competitive long distance industry. The advantages of competitive markets over regulation are many, but most relevant to this discussion is that even if fees or prices exceed cost at any given moment, rivalry among firms ensures that there are forces at work to eliminate excessive profits by bringing prices in line with costs. These competitive forces are self-activating and self-enforcing, requiring neither regulator recognition of a problem nor lengthy regulatory proceedings riddled with the private interest of regulated parties to achieve the intended results.

IV. Income and Usage

In its NOI, the Commission asks numerous questions about the "correlation between income and usage" and the potential need for "universal service" or "welfare" programs for long distance services. As mentioned above, (subsidized) low usage customers will, by necessity and design, pay more (per minute on average) for network access as a consequence of Access Reform. Potential problems arise only if low usage is synonymous low income, so that Access Reform might be interpreted as being excessively burdensome on the nation's poor. To address this issue, the relationship between income and usage is evaluated using PNR's *Market Share Monitor* database. This product is the only publicly available database containing information on usage and income.[26] A data set of household bill information for local, cable, and long distance

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[25] *Enduring Local Bottleneck II* (Hatfield Associates, 1997) estimates product development and sales expenses to be $1.72 per month. The HAI Cost Model (5.0) estimates bill rendering and customer service costs to be $1.37 per month.

[26] While the representativeness of the data may be questioned, it is the only publicly available database of long distance bills for which I am aware.

expenditures and usage during 1997 is constructed from the PNR data (18,942 observation for long distance, 11,152 observations for local and cable).

Correlation can be measured in a number of ways. For example, a simple correlation coefficient (ρ) is a measure of the strength and direction of the linear relationship between two variables. Positive correlation indicates that the variables move in the same direction, while negative correlation implies the opposite. Perfect positive correlation is indicated by $\rho = 1$ and perfect negative correlation by $\rho = -1$. If two variables are positively (negatively) correlated, then $\rho > 0$ (< 0). If the two variables are not correlated at all, $\rho = 0$. The choice of "strong" correlation is somewhat arbitrary, but values lying between -0.6 and 0.6 are typically interpreted as having low or weak correlation. For the PNR data, the correlation between the total minutes and income or total expenditures and income is about $\rho = 0.14$, indicating a positive but very weak correlation between usage and income.[27] This low correlation is consistent with estimates of the income elasticity of demand for long distance services (i.e., the percent change in quantity divided by the percent change in income). Numerous studies have estimated the income elasticity for long distance service and, in nearly every case, the income elasticity for toll services is found to be less than unity.[28]

Another test of the relationship between income and usage is to compare the mean usage across income groups. For this test, we compare the mean usage levels between income quintiles of U.S. households. In Table 1, the mean incomes of each quintile are presented. Three usage statistics from the PNR data are provided for each quintile: a) the average long distance bill; b) the average minutes of usage; and c) the percent of bills less than $5. All three usage statistics indicate a positive, but weak, relationship between income and usage. For example, while income rises by about 150% between quintiles 1 and 2, minutes increases by only 15%. Similarly, income increases by 113% between quintiles 4 and 5 and usage increases only by 21%. Low usage (defined by bills less than $5) is common at all income levels and is only slightly more common at low incomes that at higher incomes. For example, 21% households in the second quintile and 16% of households in the fourth quintile have long distance bills less than $5.

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[27] Using Fisher's *z*-test, the bounds of the correlation coefficient are determined to be about 0.13 to 0.15. The simple correlation coefficient between income and local phone charges is ($\rho = 0.13$) and between income and cable service is ($\rho = 0.10$).

[28] Lester D. Taylor, TELECOMMUNICATIONS DEMAND IN THEORY AND PRACTICE, (Dordrecht: Kluwer 1994), Ch. 6, Appendix 1 and 2.

Average revenue per minute is not considerably different across income quintiles.

Table 1. Income, Usage, and Expenditures

	Lowest Fifth	*Second Fifth*	*Third Fifth*	*Fourth Fifth*	*Highest Fifth*	*All*
Mean Income[a]	$8,872	22,098	37,177	$57,582	$122,764	$37,005[b]
Monthly Bill	$20.56	$23.71	$27.42	$30.34	$37.12	$27.45
Total LD Minutes	123	141	171	187	226	167
Bill ≤ $5	27%	21%	19%	16%	13%	19%
Avg. Revenue Per Minute	$0.167	$0.168	$0.160	$0.162	$0.164	$0.164
Local	$29.09	$29.63	$31.11	$33.11	$36.13	$31.86
Local (excl. local toll)	$25.44	$25.95	$26.97	$29.07	$31.73	$27.91
Cable Bill	$33.74	$35.30	$35.42	$37.82	$40.15	$36.72

[a] Source: Census Data (1997 Income) and PNR Market Share Monitor (1997).
b Income data is from PNR Market Share Monitor and is matched to Census quintile data using weighted averages of PNR income groupings.

Also included in Table 1 are the average monthly flat charges for local telephone and cable television services for each income quintile. The monthly flat charges for these services are substantially larger than those charged for long distance service as either a monthly minimum, a monthly flat charge for a two-part priced calling plan or the charges to recovery the PICC. Indeed, in light of the fact that sizeable monthly flat charges are common for communications services, the Commission's concern over the relatively trivial flat charges for long distance services should be alleviated.

The various measures of correlation between income and usage presented here suggest that while income and usage are positively correlated, long distance demand is not highly sensitive to income. Furthermore, low usage is common at all income levels indicating that low usage a poor proxy for low income.[29] Table 1 also illustrates that the $3 to $5 flat charges and minimums (or the $1 to $1.50

[29] In the sense that the correlation is consistently positive, but the correlation is "low."

PICC recovery fees) in the long distance industry are trivial when compared to the fixed monthly fees of local and cable television services. Thus, the recent changes in access charges and long distance calling plans have the desirable properties of being more cost causative and not excessively burdensome on any particular income group.

V. Conclusions

This Policy Paper shows that if the goals of Access Reform, both specifically and generally, are to be accomplished, it is necessary that the pricing structure of access services and long distance rates consist of both fixed monthly fees and usage charges. Such cost-causative, two-part pricing structures are consistent with both the stated intent of the Commission's Access Order and the general economic principles of efficient pricing. The Commission's intention to eliminate the implicit subsidies created by the pre-Reform access pricing structure will, by necessity, force some consumers to pay more. Specifically, previously subsidized consumers will pay more while previously subsidizing consumers will pay less. This consequence of Access Reform was expected, indeed inevitable, and is no cause for alarm. Any attempt to regulate away intended consequences is particularly undesirable.

In addition, this Policy Paper provides some evidence on the relationship between usage and income. This evidence indicates that while usage and income are positively correlated, the correlation is weak. Furthermore, low usage (the focus of the NOI) is found to be common at all income levels suggesting that the recent changes in the industry are not excessively burdensome to households of a particular income level. Thus, Access Reform would appear to be fairly innocuous on fairness grounds.

In light of the ostensible pro-competitive, deregulatory spirit of the Telecommunications Act of 1996, the pro-regulatory nature of the Commission's NOI is discouraging. The NOI and attached comments of three Commissioners all concur that the long distance industry is substantially competitive. Price regulation in competitive markets is unnecessary and welfare reducing. Re-regulating the rates of the long distance carriers blatantly contradicts the objectives of the 1996 Act and would be a major set back for telecommunications policy. Price is the driving force of the competitive market, signaling incumbents, entrants, and consumers to allocate resources in the most efficient manner. The regulation of prices in a competitive market is perhaps the most damaging of interventions, leaving the market impotent to perform its most critical function.