

## On the Road to More Efficient Pricing of Telecommunications Services: A Look at the Evidence

George S. Ford, PhD\*

October 5, 2011

### Introduction

For decades, economists have encouraged regulators to implement more efficient telephone pricing policies in order to eliminate the pervasive cross-subsidies from usage-based services to basic connections.<sup>1</sup> Slowly, and reluctantly, regulators have moved in this direction. The most recent significant reform was implemented by the Federal Communications Commission (“FCC”) in its *CALLS Order* in 2000,<sup>2</sup> which reduced usage-based access rates and raised caps on the Subscriber Line Charge (“SLC”), a fixed, monthly fee paid by local phone company subscribers for basic connections.<sup>3</sup> At present, the Commission is evaluating additional reform of this type labeled the “America’s Broadband Connectivity Plan” (the “ABC Plan”), which proposes, among other things, to cut per minute access rates to near zero (\$0.0007 per minute) and raise the cap on the SLC over five-years,<sup>4</sup> satisfying the *National Broadband Plan’s* recommendation for “long-term intercarrier compensation (ICC) reform that creates a glide path to eliminate per-minute charges while providing carriers an opportunity for adequate cost recovery.”<sup>5</sup>

Given the movement to more efficient pricing over the past 30 years, it should be possible to evaluate the effect on consumers from such changes by looking at historical data.<sup>6</sup> I do so here. Using data collected by the FCC, I study access revenues received by large, traditional

telephone carriers over the period 1990 through 2007. My analysis suggests that the migration to more efficient pricing has substantially benefitted consumers—the average local phone consumer pays \$8 less in interstate monthly access charges today, when pricing is more efficient, than in the past when the pricing system was riddled with cross-subsidies. Moreover, for the average phone company customer, the data indicate that for every \$1 reduction in carrier revenues from usage fees, revenues from SLCs increase only \$0.40. Thus, the expected elimination of \$2 in monthly per-line usage-based access revenues is expected to increase SLC revenues only by about \$0.80 on a per-line, per-month basis, well below the proposed cap increase of \$3.75 per line month.

---

---

*Based on historical evidence, each customer could pay about \$14 less per year in access charges if the ABC Plan’s proposed reductions in access rates are implemented [or] \$1.4 billion per year in the aggregate*

...

---

---

These data suggest that the continued migration to more efficient pricing of telecommunications services, as proposed by the ABC Plan, will likely lead to lower out-of-pocket expenses to

the consumers for such services. Based on historical evidence, each customer could pay about \$14 less per year in access charges if the ABC Plan's proposed reductions in access rates are implemented. Multiplied by the total number of access lines provided by the FCC's most current data, the ABC Plan could save American consumers approximately \$1.4 billion per year in the aggregate on traditional voice services provided by the nation's largest phone companies.

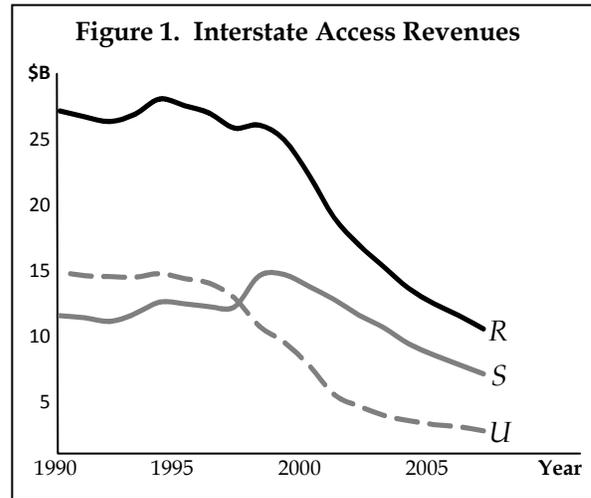
I note that it is not possible to say *exactly* what the outcomes of the ABC Plan will be; price setting in partially-regulated telecommunications markets is difficult to model and the Plan includes many other features such a monthly maximum prices for telephone service that check SLC increases.<sup>7</sup> However, a review of historical data within which similar reforms have occurred suggests reforming access charges in the way proposed by the ABC Plan will be beneficial to the average customer.

**Analysis**

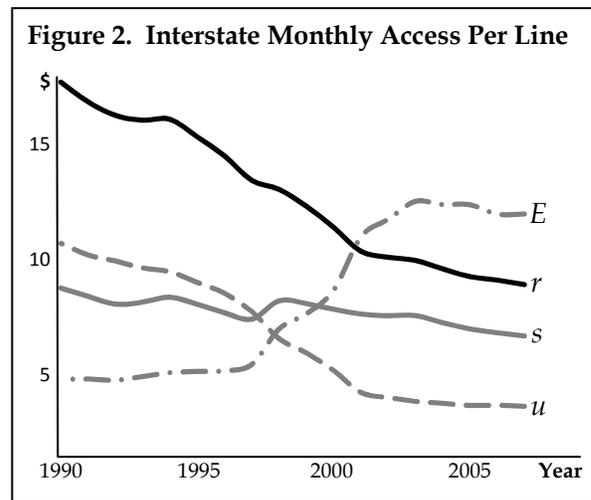
The data I analyze are from the FCC's *Automated Reporting Management Information System* ("ARMIS"). Over the period 1990 through 2007 (which exhausts the data), data are collected on interstate End User (i.e., SLC) access revenues (labeled *S*), usage-based (per-minute) access revenues (*U*), total access revenues ( $R = S + U$ ), and billable access lines (*N*) for the group of firms labeled by the data as "Large ILECs."<sup>8</sup> All revenues are expressed in 2007 dollars.<sup>9</sup> I also then express all revenues for the average "consumer" by dividing revenues by lines ( $s = S/N$ ;  $u = U/N$ , and  $r = R/N$ ).<sup>10</sup> Revenues are exclusive of interstate special access services.

Figure 1 illustrates the history of interstate access revenues of these types. As is apparent from the figure, in the early 1990s, access revenue was mostly from usage-based charges (*U*), with SLC revenue (*S*) amounting to only

about 46% of access revenue. In 2007, in contrast, SLC revenue accounted for 70% of access revenue, a dramatic (though incomplete) shift in the direction of more efficient pricing. The two revenue sources were essentially equal in 1997.



Interstate access revenues on a per-line basis are illustrated in Figure 2. The patterns in revenues are very similar across Figures 1 and 2, with SLC revenues rising over time, usage revenues declining over time, and total access revenues per-line declining quickly since the late 1990s. The trend in *r*, measuring total access revenue per line, is plainly downward over the sample period. Consumers are paying less in access charges subsequent to reform.



Included in Figure 2 is a series labeled *E*, which represents the ratio of fixed- to usage-based access revenue.<sup>11</sup> Given the near zero marginal cost of usage, it is possible to think of the ratio  $s/u$  as a measure of relative efficiency in the pricing system. Comparing the pattern in this series *E* (rising) with that of total access revenues per line *r* (falling), the data suggest that the more efficient is the pricing system, the lower is the amount of access charges paid by customers. The data therefore suggest that moving toward efficient pricing policies is good for consumers, reducing their out-of-pocket expenses for access services.

Figures 1 and 2 suggest that the sample period can be sensibly divided into two eras of access charge regulation. The series labeled *E* in Figure 2 provides the clearest distinction (where *E* is based on the ratio  $s/u$ ). From 1990 through 1997, the ratio of SLC and usage revenue ( $s/u$ ) was relatively stable at a value of about 0.84. From 2003 through 2007, the ratio  $s/u$  was also relatively stable at a value of 2.68. As shown in Figure 2, years 1998 through 2002 are a transition period to a more efficient pricing policy. Excluding the middle transition years, I define a Pre-Reform period as years 1990 through 1997 (seven years) and the Post-Reform period as years 2003-2007 (five years).

---

*... The shift to more efficient pricing policies is not revenue neutral. In fact, based on the historical data, for every \$1 reduction in usage revenues per-line, fixed-charge revenues increase by only \$0.40.*

---

How pricing reform impacts average access charge recovery from customers can be assessed by comparing such revenues across the Pre- and Post-Reform periods. The average *r* in the Pre-Reform period is \$17.84 per month, but in the

Post-Reform period is only \$9.69 per month, for a difference of -\$9.69 (a 46% reduction in average access revenue per line).<sup>12</sup> The bootstrapped t-statistic on the difference is -12.94 (with a probability well below 1% level).<sup>13</sup> If I account for the difference in average per-minute access minutes over time, then the reduction in average payments is -\$7.79, with a bootstrapped t-statistic of -10.62 (probability < 0.01).<sup>14</sup> These tests confirm that average access payments decline for the average customer after curtailing inefficient cross-subsidy schemes (a fact made obvious in Figure 2), even accounting for changes in usage.

A declining *r* also implies that increases in SLC revenues do not fully offset reductions in usage revenues. The shift to more efficient pricing policies is *not* revenue neutral. Historically, for every \$1 reduction in usage revenues per-line, fixed-charge revenues increase by only about \$0.40.<sup>15</sup> As consumers are the source of such revenues, it appears that consumers reap substantial benefits from such reform.

I can use this result to roughly predict the effect on SLC revenues of the ABC Plan's reduction of access charges to \$0.0007 per minute. Using data from 2007, per-minute access revenues for usage was about \$2.40 per line, so say the ABC Plan's rate reduction would reduce usage-based access revenue by roughly \$2.00 per-line.<sup>16</sup> Given this, average SLC revenue is, therefore, expected to increase by roughly \$0.80 per-line, per-month (=  $2 \times 0.40$ ); a figure well below the Plan's permitted increases of \$3.75 (\$0.75 per year for five years). With about a \$2 reduction in usage revenues, a predicted \$0.80 increase in SLC revenues, a customer will pay \$1.20 less in access charges each month (about \$14 per year) after implementation of the ABC Plan.<sup>17</sup> Across all access lines, the savings is about \$1.4 billion for the customers of the nation's largest phone companies.

## Conclusion

In this PERSPECTIVE, I use government data to measure the effect on customers of the elimination of inefficient cross-subsidy schemes to more efficient pricing. The topic is relevant and timely; the FCC is currently evaluating the ABC Plan that proposes to further curb subsidies and attenuate rate arbitrage by reducing per-minute access rates to near zero while allowing the maximum permitted rate on SLCs to rise. This idea is not a new one as the migration to lower usage and higher caps for SLCs has been in process for longer than a decade.

Based on historical data, the movement to more efficient pricing policies has been a windfall to consumers, substantially reducing the amount of access charges consumers pay. Indeed, customers pay about \$8 less per-line, per-month, in access charges after reform than they did when usage-based fees were high. For every \$1 reduction in usage-based access revenues, the revenues from SLCs increase by only \$0.40. Based on this figure, SLC revenues are expected to rise by about \$0.80 per-line, per-month, if per-minute access revenues are reduced to near zero. With roughly a \$2 reduction in usage revenues from the ABC Plan, a typical customer will pay about \$1.20 less per month (\$14 per year) in access charges upon implementation of the Plan. Multiplied by the total number of access lines provided by the FCC's most current data, the ABC Plan could save American consumers approximately \$1.4 billion a year in the aggregate on traditional voice services provided by the nation's largest phone companies.

As I noted above, however, it is impossible to say exactly what the outcomes of the ABC Plan will be. The Plan includes many components, not just those considered here, including maximum prices for certain services, which limit the ability to raise the SLC. Moreover, local phone service is no longer offered under

monopoly conditions for most Americans. Indeed, recent statistics suggest that local phone companies provide landline service to only about 50% of homes.<sup>18</sup> Finally, telephone service is subject to continuing regulation in many markets, and some new regulations under the ABC Plan. Nevertheless, a review of historical data suggests reforming access charges in the way proposed by the ABC Plan will be beneficial to the average customer.

## NOTES:

\* **Dr. George Ford is Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies. The views expressed in this PERSPECTIVE do not represent the views of the Phoenix Center, its Adjunct Fellows, or any of its individual Editorial Advisory Board Members.**

<sup>1</sup> See, e.g., A. E. Kahn, *The Road to More Intelligent Telephone Pricing*, 1 YALE JOURNAL ON REGULATION 139-57 (1984); D.L. Kaserman and J.W. Mayo, *Cross-Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing*, 11 YALE JOURNAL ON REGULATION 119-47 (1994); A. Larson, T. Makarewicz and C. Monson, *The Effect of Subscriber Line Charges on Residential Telephone Bills*, 13 TELECOMMUNICATIONS POLICY 337-54 (1989); D.L. Kaserman and J.E. Flynn, *Cross-Subsidization in Telecommunications: Beyond the Universal Service Fairy Tale*, 2 JOURNAL OF REGULATORY ECONOMICS 231-250 (1990); J. Wenders and B. Egan, *The Implications of Economic Efficiency for US Telecommunications Policy*, 10 TELECOMMUNICATIONS POLICY 33-40 (1986); Walter G. Bolter *et al.*, TELECOMMUNICATIONS POLICY FOR THE 1980'S: THE TRANSITION TO COMPETITION 360 (1984); *Separate Statement of Commissioner Anne P. Jones, Concurring and Dissenting in Part, In re: MTS and WATS Market Structure, Phase I*, CC Docket 78-72, 93 FCC 2d 367 (1980); T.R. Beard and G.S. Ford, *Do High Call Termination Rates Deter Broadband Deployment?* PHOENIX CENTER POLICY BULLETIN NO. 22 (October 2008) (available at: <http://www.phoenix-center.org/PolicyBulletin/PCPB22Final.pdf>); and many others.

<sup>2</sup> *Access Charge Reform, Price Cap Performance Review for Local Exchange Carriers*, CC Docket Nos. 96-262 and 94-1, SIXTH REPORT AND ORDER, *Low-Volume Long Distance Users*, CC Docket No. 99-249, REPORT AND ORDER, *Federal-State Joint Board on Universal Service*, CC Docket No. 96-45, ELEVENTH REPORT AND ORDER, 15 FCC Rcd 12962 (2000) (CALLS Order), *aff'd in part, rev'd in part, and remanded in part, Texas Office of Public Util. Counsel et al. v. FCC*, 265 F.3d 313 (5th Cir. 2001), *cert. denied, National Association of State Utility Consumer Advocates v. FCC*, 535 U.S. 986 (2002); *on remand, Access Charge Reform; Price Cap Performance Review for LECs; Low-Volume Long Distance Users; Federal-State Joint Board on Universal Service*, CC Docket Nos. 96-262, 94-1, 99-249 and 96-45, ORDER ON REMAND, 18 FCC Rcd 14976 (2003) (CALLS Remand Order).

<sup>3</sup> The CALLS Plan shifted some of the access reductions to an explicit recovery charge on interstate revenues (referred to as Interstate Access Services or IAS). IAS revenues are included in the analysis.

<sup>4</sup> The details of the plan are available at: <http://americasbroadbandconnectivity.org/the-plan>.

<sup>5</sup> CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN, Federal Communications Commission (March 16, 2010) (available at: [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-296935A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296935A1.pdf)) (hereinafter the *National Broadband Plan*) at p. 136.

<sup>6</sup> *Trends in Telephone Service*, Federal Communications Commission (September 2010) at Table 1.1 (showing rising SLCs and declining charges per minutes since the late 1980s) (available at: [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-301823A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf)).

<sup>7</sup> My analysis is not based on a structural model of revenue determination, nor does the statistical analysis account for the multitude of macro- and micro-economic influences on revenues such as technological change occurring over time (though two of the most important influences are considered—lines and usage). As such, I cannot and do not assign a causal interpretation to the findings. Nevertheless, the pattern of access costs during periods of transition is an interesting issue, and these historical facts may help policy makers navigate the numerous ad hoc arguments of various parties.

<sup>8</sup> This sample period exhausts the available data on the FCC's ARMIS tool (available at: <http://transition.fcc.gov/wcb/armis>). Interstate (and common line) access revenue data for the large local exchange carriers are from Form 43-04, Lines 4014(i), (d) and 4011(d). Total industry IAS revenues are from the FCC's *Universal Service Monitoring Report* (2010), Table 3.2. I attribute a share of these revenues to the large carriers reported in ARMIS using a factor derived from the ARMIS data for years 2006 and 2007 (based on the difference between 4011(d) and 4014(n)). Special access revenues are excluded.

<sup>9</sup> I convert nominal to real dollars using the Consumer Price Index (available at: <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>).

<sup>10</sup> Access line data is from Form 43-01 ("Billable Access Lines").

<sup>11</sup> For the figure, the ratio  $s/u$  is scaled by a factor of 5 to better match the scale of the other series [ $E = 5(s/u)$ ].

## NOTES CONTINUED:

- <sup>12</sup> The means difference are computed using least squares regression with the dependent variable  $r$  regressed on a dummy variable equal to 1.0 for the Post-Reform period (0 otherwise) and a constant term. There are 13 observations. The bootstrap procedure uses 400 repetitions.
- <sup>13</sup> Given the near monotonic decline in  $r$ , the statistical test is merely confirming what is readily apparent from the figure.
- <sup>14</sup> The means difference are computed using least squares regression with the dependent variable  $r$  regressed on two covariates: a dummy variable equal to 1.0 for the Post-Reform period (0 otherwise) and switched access minutes from Form 43-01 (“Switched Traffic Sens. Demand-MOU: Premium”). There are 13 observations. The bootstrap procedure uses 400 repetitions. While total access minutes have declined over this period due to line loss and wireless substitution, the average number of minutes per line is approximately equal across the two periods.
- <sup>15</sup> This statistic is estimated by least squares regression with  $s$  as the dependent variable and  $u$  as the regressor (and a constant term) using data from the Transition and Post-Reform period. There are 10 observations.
- <sup>16</sup> The current large ILEC rate is about 0.0055 per minute and the proposed rate is 0.0007; the ratio of the two (0.127) multiplied about \$2.40 leaves about \$0.30 in usage based revenues. So, \$2 is a rough approximation of the loss of usage-based revenues per line.
- <sup>17</sup> That said, this reduction is based on historical data alone; I have not developed a structural model of price determination.
- <sup>18</sup> J. Bazinet *et al.*, *Video, Data, & Voice Distribution*, CITI INVESTMENT RESEARCH & ANALYSIS (May 13, 2011) (“[t]elco voice declined to around ... 43% of all US households”); *Trends in Telephone Service, supra n. 7*, at Table 7.4 (24.5% of homes are wireless only), Table 8.1 and 8.2 (non-ILEC end-user switched access lines were about 27% at the end of 2008).



**PHOENIX** FOR ADVANCED  
LEGAL & ECONOMIC  
C E N T E R PUBLIC POLICY STUDIES  
www.phoenix-center.org

**PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES**

5335 Wisconsin Avenue, NW, Suite 440

Washington, D.C. 20015

Tel: (+1) (202) 274-0235 • Fax: (+1) (202) 318-4909

[www.phoenix-center.org](http://www.phoenix-center.org)