THE Brattle GROUP

March 27, 2019

VIA ELECTRONIC FILING (ECFS)
Marlene H. Dortch, Esq., Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

RE: *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Structure and Practices of the Video Relay Service Program; Misuse of Internet Protocol (IP) Captioned Telephone Service*, CG Docket Nos. 13-24, 10-51, and 03-123

Dear Ms. Dortch:

Pursuant to the procedures outlined in the *Order and Third Protective Order* ("*Third Protective Order*") in this proceeding,[1] we hereby submit a redacted version of a report prepared by Coleman Bazelon and Brent Lutes titled "Economic Considerations of IP CTS Rate Structure and Methodology."

Concurrently, The Brattle Group is submitting a Highly Confidential version of this report pursuant to *Third Protective Order* that includes discussions and analysis of information designated as Highly Confidential Information and Confidential Information in the *Third Protective Order*.[2] Capitalized terms used herein and not otherwise defined have the meanings ascribed to such terms in the *Third Protective Order*.

In the event that there are any questions concerning this matter, please contact the undersigned at brent.lutes@brattle.com.

Respectfully submitted,
The Brattle Group

/s/ Brent Lutes, PhD
Associate

Enclosure

cc: Eliot Greenwald
TRSReports@fcc.gov

---

1 *See Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities; Structure and Practices of the Video Relay Service Program; Misuse of Internet Protocol (IP) Captioned Telephone Service*, Order and Third Protective Order, 33 FCC Rcd 6802 (CGB 2018).

2 *Id.* ¶ 4.

Economic Considerations of IP CTS Rate Structure and Methodology

PREPARED FOR

Hamilton Relay, Inc.

PREPARED BY

Coleman Bazelon, PhD

Brent Lutes, PhD

March 27, 2019

THE Brattle GROUP

Notice

This white paper reflects the perspectives and opinions of the authors and does not necessarily reflect those of The Brattle Group's clients or other consultants. However, we are grateful for the valuable contributions of many consultants of The Brattle Group. Where permission has been granted to publish excerpts of this white paper for any reason, the publication of the excerpted material must include a citation to the complete white paper, including page references.

Table of Contents

I. Introduction

Telecommunications Relay Services ("TRS") provide individuals who are deaf or hard of hearing with the ability to place and receive telephone calls. Internet Protocol Captioned Telephone Service ("IP CTS") is currently the most prevalent type of TRS. Title IV of the Americans with Disabilities Act ("ADA") stipulates that TRS services must 1) be provided at no additional cost to the user; and 2) be provided "in a manner that is functionally equivalent" to the services available to individuals who are not deaf or hard of hearing with respect to placing and receiving calls. The Interstate TRS Fund exists to collect funds from contributor carriers and use those funds to compensate providers of TRS services. The Federal Communications Commission ("FCC" or "Commission") has a mandate to ensure that people who are deaf or hard of hearing have access to functionally equivalent service to the extent possible and in the most efficient manner.

In a June 2018 Further Notice of Proposed Rulemaking, the FCC proposed compensating IP CTS providers using a cost-based rate and invited commenters to both respond to the proposal and submit alternative methodologies. In this paper, we discuss inefficiencies and other the shortcomings of the cost-based rate methodologies, examine other proposed methodologies, and propose a price cap rate methodology as the most economically efficient option of those under consideration. We recommend a price cap because it mitigates the two key problems that prevent cost-based rates from being efficient, which are that when subject to cost based rates 1) providers are not incentivized to engage in efficiency-enhancing activities of their own volition and 2) regulators do not have sufficient information about potential efficiency gains to compel providers to engage in efficiency enhancing activities.

Price cap rate methodologies alleviate the incentive problem by allowing providers to retain some portion of the expected gains realized through efficiency enhancing behavior, which naturally incentivizes them to engage in such activities. This in turn causes providers to reveal information about efficiency potential to regulators,[1] enabling regulators to set more efficient rates in the future. Ultimately, a price cap methodology is intended to minimize costs over time by providing a trade-off between 1) saving the payer as much as possible in the contemporaneous time period and 2) saving the payer more in future time periods. We discuss the economic reasoning behind

[1] If providers do not *act* efficiently, regulators will not know the extent to which providers *could* be more efficient. Because providers will be incentivized to engage in efficiency-enhancing behavior under a price cap methodology, information about the potential for efficiency will be observable to regulators. This is in contrast to certain other rate methodologies (*e.g.,* regulated rate of return) that may disincentivize efficient behavior. In practical terms, the mechanism by which information about efficiency gains is transmitted to regulators would be some form of cost reporting during periods of price cap recalibration. Although cost reporting may be an inaccurate measure of actual provision cost levels, it will likely be a reasonable indicator of efficiency gains as measured by the change in reported costs, assuming reporting standards and practices are consistent over time.

price cap rate methods in Section II.A, and in Section II.B offer several important lessons learned from the misapplication of price cap to the IP Relay market.

In practical terms, a price cap rate methodology starts with an initial rate that is periodically adjusted for inflation and reduced by a predetermined percentage, called the "X-factor." The rate base and X-factor can also be recalibrated at predetermined intervals in order to realign projected efficiency gains with realized efficiency gains. In constructing a price cap rate, several factors should be considered. First, to avoid the potential for market failure, the initial rate must be set in a way that provides a fair return for providers and does not cause a structural change in the market; the initial rate is not itself a vehicle for efficiency gain. Second, outside of recalibration periods, the X-factor must be decoupled from providers' realized provision costs to incentivize providers to reduce costs.[2] Third, since the risks associated with setting the X-factor too high are greater than the risks associated with setting it too low, setting an overly aggressive X-factor may be counterproductive. Finally, exogenous costs should typically be compensated on top of the price cap rate rather than being built into the rate. These issues are explained further in Section II.C., with a more detailed discussion of issues around recalibration in Section II.D.

In Section III, we propose a specific price cap rate with a starting point of $1.9467, an X-factor of 1.1%, an inflation adjustment based on the Gross Domestic Product Price Index ("GDPPI"), and recalibration periods every four years. The starting point for the price cap is based on the 2017-2018 MARS rate, which is a natural choice as it is determined by market forces, and hence reflective of actual provision costs, and it has proven unlikely to be disruptive. Moreover, the 2017-2018 MARS rate is the last rate established through an approved and codified methodology. An X-factor of 1.1% reflects the estimated rate of efficiency gain in the IP CTS market based on changes in reported costs over time. We suggest GDPPI for the inflation factor because it is both a relevant and central measure of inflation. We suggest a four-year interval between recalibration periods because it is the median of the typical price cap period. In Sections III.A-D, we present the economic motivation for these specific parameters of our proposal.

In Section IV, we further discuss issues surrounding cost-based rate methodology. In sum, cost-based rates present substantial incentive and regulatory problems that have been widely recognized by both regulators and economists. Indeed, substantial empirical evidence demonstrates that provider costs tend to be higher under cost-based rates than under alternative methodologies.

In Section V.A, we explain why a tiered rate structure is unnecessary, inefficient, and likely ineffective. A tiered structure subsidizes inefficient providers, which increases the burden on the TRS fund. Moreover, a tiered rate structure is not needed to induce market entry given that potential entrants have access to capital markets. This is evident by the fact that several providers have recently entered the market and two more are currently applying for certification, all without

---

[2] Note that realized provision costs should only be reported and considered during predetermined recalibration periods. If costs are reported in the interim periods, rates should remain unaffected by the difference between reported cost savings and the costs savings anticipated through the X-factor.

the existence of tiers or an emergent provider rate. In Section V.B we discuss ClearCaptions, LLC's ("ClearCaptions") specific tiered rate proposal and demonstrate that it is designed in such a way that benefits ClearCaptions to the detriment of other providers. In Section V.C we discuss MezmoCorp's (dba InnoCaption) ("InnoCaption") specific tiered rate proposal and demonstrate that it, too, is designed in such a way that benefits InnoCaption to the detriment of other providers.

In Section VI, we examine the shortcomings of CaptionCall, LLC's ("CaptionCall") proposed auction based rate. A key problem with CaptionCall's proposal is that it decouples prices from quantity, as the FCC has previously pointed out with respect to a similar proposal put forth by CaptionCall. Without providers' knowing the volume for which they are bidding, they cannot bid in a way that accounts for their individual economies of scale. Moreover, the structure of the auction would likely result in reduced long run competition which would be harmful to users and increase the burden on the TRS Fund.

II. A Price Cap Rate Methodology Is Appropriate for IP CTS

A price cap rate methodology is a construct such that "real" (inflation-adjusted) rates change from period to period based on some predetermined expectation of efficiency gains.[3] In practical terms, the rate in one period is equal to the rate in the previous period, plus an adjustment for inflation and less an efficiency adjustment, or "X-factor." Because the X-factor does not change outside of predetermined recalibration periods, the short-run time path of the real reimbursement rate is entirely predictable and unaffected by the actual contemporaneous changes in efficiency that providers are able to realize. This separation between the X-factor and realized cost efficiency gains creates a strong incentive for providers to invest in efficiency-enhancing measures, as they will be able to retain the surplus created through cost reductions that exceed those anticipated by the X-factor, at least until the X-factor and base rate are recalibrated. In the following sections, we discuss the economic principles related to price cap methodologies, the lessons to be learned from previous price cap methodologies implemented for another form of relay service, the pertinent issues to consider when constructing a price cap rate structure, and matters pertaining to the periodic recalibration of rates.

A. Economics of Price Cap Methodologies

The economic rationale behind price cap methodologies is to provide a trade-off between static efficiency and dynamic efficiency. [4] Static efficiency is achieved by minimizing the contemporaneous rate (and provider earnings) in order to minimize the contemporaneous cost burden faced by payers – in this case, contributors to the TRS Fund. In practical terms, a rate is statically efficient if it exactly equals minimal provision cost plus the minimal rate of return necessary to retain providers in the market, given a threshold level of quality of service. Alternatively, dynamic efficiency is achieved by optimizing the time path of future cost reductions through incentivized efficiency gains. That is, dynamic efficiency is achieved by minimizing the

---

[3] Traditionally, a price cap rate methodology does not set a rate, *per se*, but instead puts a *cap* on the rate that providers of a good or service can charge payers. Providers are free to charge a rate lower than the price cap and may rationally choose to do so under certain conditions (*e.g.,* in the presence of price competition between providers). Although the price cap methodology discussed in this paper follows the same logic and construct as the more typical application of the method, it is, for all practical purposes, setting a rate and not rate cap.

[4] Static efficiency is thought of in "terms of the refinement of existing products, processes or capabilities," while dynamic efficiency is thought of in terms of "the development of new [products, processes or capabilities]." Pankaj Ghemawat & Joan E. Ricart i Costa, "The Organizational Tension between Static and Dynamic Efficiency," *Strategic Management Journal* 14 (1993): 59.

sum of the contemporaneous and time-adjusted future cost burdens faced by the TRS Fund. Hence, a price cap methodology provides a trade-off between 1) saving the payer as much as possible now and 2) saving the payer more in future time periods.

In contrast to price cap methodologies is a regulated rate of return methodology (also known as "cost-based rates"), where regulators cap the return a provider can earn on its capital investment.[5] As previously mentioned, cost-based rate methodologies suffer from two main problems: 1) providers are not incentivized to engage in efficiency enhancing activities of their own volition; and 2) regulators do not have sufficient information to compel providers to engage in efficiency-enhancing activities.

In cost-based rate structures, the providers are incented to *maximize* provision costs within whatever regulatory cost constraints may exist. This is because a provider's earnings are calculated as a flat percentage of its expenditures. Hence, greater expenditures equate to greater earnings. These incentives may be appropriate when the goal of regulators is to spur further capital investment in a capital intensive industry.[6] However, if the regulatory goal is to incentivize providers to become more cost efficient, a regulated cost-based method is likely inappropriate.

A cost-based methodology, in contrast, can be statically efficient only if the regulator can accurately monitor costs and prescribe a rate that precisely reflects those costs. However, to produce a dynamically efficient outcome, such a method requires that regulators be perfectly and completely informed with respect to not only providers' costs but also their potential for future efficiency gains. While static efficiency may, on occasion, be achieved by a cost-based rate, the practical reality is that regulators simply cannot have sufficiently expansive or accurate information to set dynamically efficient cost-based rates.

Moreover, with a cost-based rate, it is unlikely that regulators could successfully elicit the information necessary to achieve a dynamically efficient outcome from providers. This is because if a provider were to reveal its potential for efficiency gains, regulated rates would likely be reduced to reflect that potential, thereby diminishing the provider's earnings. In essence, this is a problem

---

5 Under a rate of return structure, a regulator sets the prices that regulated firms are allowed to charge for the regulated services they provide. These prices are set with the intention of providing firms with the opportunity to earn a reasonable rate of return. If a given firm's rate of return significantly diverges from what would be expected under the rate of return scheme, the regulator has the power to adjust that firm's prices. See David E.M. Sappington and Dennis L. Weisman, "Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry?" *Journal of Regulatory Economics* 38 (2010): 229, accessed November 13, 2018, https://bwl.univie.ac.at/fileadmin/user_upload/lehrstuhl_ind_en_uw/lehre/ws1112/Energy_Seminar_2/PriceCapsSapp.pdf.

6 *Id.*

of asymmetric information,[7] where regulators need information about potential efficiency gains if they wish to set efficient cost based rates, but the incentives implicit in the rate structure discourage providers from revealing this information. While providers may well reveal accurate information about their realized costs, it is important to distinguish between revealing cost information and revealing information on the potential for efficiency gains. Cost reporting, to the extent it is accurate, will of course reveal information on costs; those costs, however, will only reveal information on efficiency if providers are behaving efficiently. Since providers are not incentivized to act efficiently under a cost-based method, reported cost information, irrespective of its accuracy, will likely not contain information on the potential for efficiency.

A price cap methodology can mitigate the inefficiencies that stem from both the incentives problem and the asymmetric information problem. It mitigates the incentive problem by allowing a provider to retain some portion of the expected gains realized through its efficiency enhancing behavior, while still benefiting payers by reducing reimbursement rates over time.[8] Between recalibration periods, the portion of expected efficiency gains retained by providers is equal to the difference between the X-factor and realized real efficiency gains. Note that this difference may be negative if a provider fails to achieve the efficiency gains prescribed by the X-factor, and may be positive if a provider achieves efficiency gains in excess of those mandated by the X-factor. In either case, the provider always captures any incremental benefits from efforts to increase efficiency. Since real rates are decreasing by an amount equal to the X-factor, the X-factor represents the share of efficiency gains remitted to payers in the short-term. In the long-term, all efficiency gains are eventually remitted to payers through periodically recalibrating the rate in a way that reflects the weighted average of efficiency gains achieved between recalibration periods. Within this structure, providers are incentivized to invest in efficiency-enhancing activities because they retain a portion of the benefits from doing so in the short-term, while payers benefit by capturing some of the short term benefits and almost all of the long-term benefits of providers' efficiency-enhancing efforts.

---

7 "[A]symmetric information [is] a fancy term indicating that managers know more about their companies' prospects, risks, and values than do outside investors." See Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, Eleventh edition (New York: McGraw-Hill/Irwin, 2014), 467.

8 Sappington & Weisman note, "In contrast [to rate of return], [price cap regulation] can promote innovation and cost reduction by severing the link between realized costs and allowed prices (at least temporarily). [Price cap regulation] secures these enhanced incentives by permitting the firm's actual returns to diverge substantially from anticipated returns." See David E.M. Sappington and Dennis L. Weisman, "Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry?" *Journal of Regulatory Economics* 38 (2010): 230, accessed November 13, 2018, https://bwl.univie.ac.at/fileadmin/user_upload/lehrstuhl_ind_en_uw/lehre/ws1112/Energy_Seminar_2/PriceCapsSapp.pdf.

This process, in turn, mitigates the problem of asymmetric information that would otherwise handicap regulators' ability to set efficient rates. Because providers are engaging in observable efficiency-enhancing behavior, they reveal information about cost efficiency and the potential for future cost efficiency to the regulator. The regulator can use that revealed information to recalibrate the price cap rate during recalibration periods, hence mitigating the problem of asymmetric information. By overcoming these problems inherent in cost-based methodologies, price caps can induce lower provision costs and a reduced burden on the TRS Fund than would be possible through cost-based rate methods.

B. Lessons from Price Cap Methodology in IP Relay

The FCC has previously implemented a price cap rate methodology for one type of TRS, Internet Protocol Relay ("IP Relay"),[9] the results of which can help inform and improve future price cap methodologies. Indeed, three general lessons can be taken from the IP Relay experience: 1) it is important to recognize that a particular regulated accounting of costs may not, in fact, account for the entirety of provision costs, and therefore should not be used to set the base rate in a price cap methodology; 2) past efficiency gains are not perfect predictors of future efficiency gains; and 3) once a regulated market is damaged by missteps in the ratemaking process, it is challenging to repair that market. These lessons are further discussed below.

The FCC initially adopted a price cap rate for IP Relay in 2007, following the suggestions of several IP Relay providers. That proposal was based on the price cap plan implemented for incumbent local exchange carriers ("ILECs").[10] Specifically, the compensation rate was set for a period of three years, during which time the rates would be adjusted upward annually for inflation (according to a pre-defined inflation factor) and downward to account for efficiency gains (according to an X-

---

[9] IP Relay is a form of TRS that allows individuals who have difficulty speaking to communicate with a CA through typed text. The CA then converts that text to speech. "Consumer Guide," Telecommunications Relay Service, Federal Communications Commission, accessed January 14, 2019, https://transition.fcc.gov/cgb/consumerfacts/trs.pdf.

[10] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Report and Order and Declaratory Ruling, 22 FCC Rcd 20140, ¶43 (2007) ("2007 Rate Decision").

factor also set at the outset of price caps).[11] The initial base for the 2007-2008 fund year was $1.293 per minute.[12]

The FCC adopted this formula for a three-year rate period, 2007-2010, and committed to reassessing the base rate for the subsequent three-year period. The Commission expressly rejected tiered rates, explaining that (i) "there is not the same size disparity among IP Relay providers as there is with the Video Relay Service ("VRS") providers" and (ii) "the IP Relay rates have been much lower than the VRS rates, and have not varied significantly over time."[13]

In 2010, the FCC renewed the price cap formula for an additional three years with a new base of $1.2985.[14] When reexamining the IP Relay rate in 2013, the Commission's Consumer and Governmental Affairs Bureau ("CGB" or "Bureau") adopted a base rate of $1.0147 per minute with a 6.0% net efficiency factor adjustment.[15] The nearly 20% reduction in the base rate was due, in part, to a recalculation of weighted IP Relay provider costs that showed those costs as being much lower than the reimbursement rate.[16] In addition, the FCC determined in a prior order to stop funding outreach at a cost of $0.0244 per minute.[17] The TRS Fund Administrator recommended the 6.0% efficiency factor as "this amount represents the average annual decrease in the cost of providing IP Relay service from 2007 to the current Fund year," and the Commission accepted the recommendation.[18] Specifically, the Commission said that the significantly changed X-factor adjustment (6.0% versus 0.5%) was "justified because of the need to take account of the rapid cost declines characteristic of this industry segment and because, given the excess of the base rate over

---

[11] The initial base for the 2007-2008 fund year was $1.293 per minute. The formula was as follows: "[T]he price cap plan applies three factors to a base rate – an Inflation Factor, an Efficiency (or "X") Factor, and Exogenous Costs. The basic formula takes a base rate and multiplies it by a factor that reflects an increase due to inflation, offset by a decrease due to efficiencies. The Inflation Factor will be the Gross Domestic Product – Price Index (GDP-PI)). The Efficiency Factor will be set as a figure equal to the Inflation Factor, less 0.5% (or 0.005) to account for productivity gains. As a result the rate for a particular year will equal the rate for the previous year, reduced by 0.5% (*i.e.*, $\text{RateYear}_Y = \text{RateYear}_{Y-1}(1 - 0.005)$)." *2007 Rate Decision*, ¶ 43.

[12] *Id.*, at ¶ 66.

[13] *Id.,* at ¶ 46.

[14] The Commission noted that the rate included "$0.0503 per minute for ongoing ten-digit numbering and E911 costs and $0.0204 per minute as a rate of return on capital investment." Order, *In the Matter of Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Order, 25 FCC Rcd 8689, ¶¶ 25-26 (2010).

[15] *Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Structure and Practices of the Video Relay Service Program*, Order, 28 FCC, Rcd 9219, ¶ 20 (CGB 2013).

[16] *Id.*, at ¶ 11.

[17] *Id.*, at ¶ 17.

[18] *Id.*, at ¶ 12.

average costs, it is appropriate for rates to be adjusted downward in subsequent years so that they reach levels close to average provider costs before the end of the three-year cycle."[19]

The Bureau reconsidered its decision in June 2014 after several providers left the market. Specifically, the CGB adjusted the base rate up two cents, to $1.0607, to reflect new cost calculations that excluded those providers who had left the market.[20] In addition, the CGB reset the efficiency factor from 6.0% to 0% after concluding "that the information [it] used in the 2013 TRS Rate Order to establish the 6.0 adjustment factor – the average rate of decline in per-minute IP Relay costs between 2007 and 2012 – is not necessarily an accurate predictor of *future* changes in IP Relay costs."[21]

By the time the CGB acted, however, Sprint was the only IP Relay provider remaining. Just six months later, the Bureau again increased the IP Relay rate, this time on an interim basis to $1.37 for the remainder of the 2014-2015 fund year, but with a separate rate of $1.67 for any monthly minutes in excess of 300,000, representing a mid-year increase of anywhere from 29% to 57% in the IP Relay rate.[22] In setting this rate, the CGB noted that, "[g]iven the present exigent circumstances, where Sprint is likely to cease to provide IP Relay without a rate adjustment, [the Bureau finds] that it would be contrary to the public interest for consumers to be left without any IP Relay service, and thus [finds] it necessary to adopt this mid-year rate adjustment."[23] The IP Relay market continues to be non-competitive, with Sprint the only provider offering IP Relay to consumers, as no other entities have restarted their service or entered the market.[24]

---

[19] *Id.*, at ¶ 20.

[20] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Structure and Practices of the Video Relay Service Program*, Order, 29 FCC Rcd 8044, ¶ 13 (CGB 2014).

[21] *Id.*, at ¶ 18 (Emphasis added).

[22] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Order, 29 FCC Rcd 16273, ¶ 12 (CGB 2014).

[23] *Id.*

[24] Note that as the sole provider in a non-competitive market, Sprint is in a position to exercise considerable leverage over the ratemaking process. This is because a market exit by Sprint would have much graver consequences than would be the case if multiple providers operated in the IP Relay market. Indeed, an exit by Sprint would likely signal the permanent collapse of the market. As a result, regulators are compelled to put substantial weight on Sprint's implied threats of market exit, hence shifting the balance of bargaining power to Sprint. To the extent that such bargaining power can be transformed into higher future reimbursement rates, this sort of induced market exclusivity may ultimately be valuable to a provider. Nevertheless, it would also likely put a larger strain on the TRS fund than is necessary. While a cost based reimbursement rate, such as that applied to the IP Relay market, can in principal be set as to retain multiple providers in the market, it is important to recognize that taking such an approach presents significantly greater risk of setting an incorrect or disruptive rate than would be the case under a market based approach. This is because a cost based rate requires regulators to have

As previously mentioned, the experience in IP Relay provides several lessons that should be considered when constructing an IP Relay rate for IP CTS. First, it is important to recognize that a particular regulated accounting of costs may not, in fact, account for the entirety of provision costs, as was demonstrated in the case of IP Relay. Most providers operate in multiple markets and face complex decisions about costs and revenues that are intertwined across business lines. These complexities may not be accurately reflected by a narrowly focused accounting of costs applied to one area in which the provider operates. In addition to being demonstrated in the IP Relay market, this challenge has presented itself in the IP CTS market insofar as there has been uncertainty with respect to which costs should and should not be reported, especially in the first few years in which IP CTS providers reported costs. Because reported costs may deviate substantially from actual costs, setting the base rate in a price cap methodology equal to reported costs will likely be problematic, as was the case in IP Relay. Ultimately, regulators should avoid relying on narrowly defined reported costs in setting a base rate and should instead rely on market based-rates (*e.g.,* the MARS rate) or on an accounting system that reflects the full extent of provision costs. Short of that, regulators should be cognizant of the limitations of the accounting system upon which they rely and allow room for error.

The second lesson to be taken from IP Relay, and one that was explicitly recognized by the Bureau,[25] is that past efficiency gains are not perfect predictors of future efficiency gains. Moreover, even if that were not the case, the relationship between past efficiency gains and future efficiency gains is likely not linear. Indeed, as an industry or enterprise matures, it is often the case that the rate of efficiency gain decreases. That is, firms continue to become more efficient, but at a slower year-over-year rate. For predictive purposes, this means that recent efficiency gains would be better predictors of future efficiency gains than would be less recent measures of efficiency gain. Hence, using a seven-year average of efficiency gains of all providers (inclusive of inefficient providers that have exited the market) to predict future efficiency gains in the IP Relay market was inappropriate. When setting an X-factor for IP CTS, it is important to base expected efficiency gains on recent efficiency gains and to recognize that even this may be an overestimate. Similarly, it is important to recognize that the average efficiency gain may be misleading if the providers in the market have changed over time. Indeed, the market exit of inefficient firms would result in an increase in *average* efficiency even if none of the firms remaining in the market had been able to gain *any* efficiency. Such dynamics should be controlled for when using a measure of efficiency gain to set the X-factor.

The third lesson to be taken from IP Relay is that once a regulated market is damaged by missteps in the ratemaking process, it is challenging, if not impossible, to repair that market. Indeed, none

---

explicit and highly accurate knowledge of providers' costs, whereas a market based rate can rely on the cost information implicit in market prices. Cost based rates are further discussed in Section IV.

[25] "[T]he information we used in the 2013 TRS Rate Order to establish the 6.0 adjustment factor – the average rate of decline in per-minute IP Relay costs between 2007 and 2012 – is not necessarily an accurate predictor of future changes in IP Relay costs." *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Structure and Practices of the Video Relay Service Program*, Order, 29 FCC Rcd 8044, ¶ 18 (CGB 2014).

of the providers who left the IP Relay market because of the devalued rate have returned, leaving the market with a single provider. While there may be a number of reasons that a provider would not wish to reenter the market after regulators have corrected the actions that drove it from the market, regulatory risk is likely a key reason. Because a catastrophic regulatory event has occurred, the level of perceived regulatory risk may be beyond the tolerance threshold of providers or their investors. As Professor Connolly, CaptionCall's economic expert, points out, "It is costly to have frequent adjustments in the rate-setting mechanism due to the high level of uncertainty it creates," and, "Uncertainty in any market leads to reductions in investments since much capital investment is irreversible."[26] Hence, this market harm may be irreparable, as appears to be the case in IP Relay.

C. Considerations when Constructing a Price Cap Rate

As a preliminary matter, regulators must choose an initial rate for the first period in which a price cap is employed. This rate should be the most accurate representation possible of a rate that leads to a fair return; it should not, in itself, be viewed as a mechanism to drive efficiency. As previously discussed, one of the primary economic goals of a price cap rate is to elicit information on cost efficiencies that regulators would not otherwise be able to observe. This information is revealed through the actions of providers over the price cap period. Hence, at the time the initial rate is set, no new information on efficiency has been revealed to regulators. The initial rate should simply be set in a way that does not cause a structural change in the market. The efficiency-enhancing incentives will flow through the fact that rates are predictable and divorced from costs. A natural choice for a rate that will not be disruptive is the 2017-2018 MARS rate, since it was implemented without market disruption and is the last rate based on a sound, non-arbitrary, Commission approved methodology. It might also be appropriate to choose an initial rate based on some measure of current provision costs, so long as those costs 1) represent a full and accurate accounting of all provision costs to include such things as applicable overhead and taxes, 2) do not push providers out of the market, thereby disrupting the market structure, and 3) leave room for any volatility or uncertainty that may relate to provision costs. However, it is important to note that current measures of provision costs likely do not meet the first criteria, as they are not a full accounting of provision costs. Notably, the iTRS Advisory Council, endorsed by the Fund Administrator, recognizes that current cost reporting is not a full accounting of provision costs.[27]

---

[26] "An Economic Analysis of Internet Protocol Captioned Telephone Service Policy Reform," Michelle Connolly, available as attachment to Comments of CaptionCall, LLC, CG Docket Nos. 13-24 and 03-123, App. C, ¶¶ 13-14 (filed September 17, 2018) ("CaptionCall Initial Comments"), https://ecfsapi.fcc.gov/file/10918582811662/PUBLIC%20Comments%20of%20CaptionCall%2C%20LLC%20(9-17-18).pdf.

[27] Rolka Loube, Ex Parte Comments, CG Docket Nos. 03-123, 13-24, at 3 (filed December 4, 2018) https://ecfsapi.fcc.gov/file/1204051341584/Ex%20Parte%20iTRS%20Council%20Comments%20FCC%2018-79.pdf.

Once an initial rate is determined, the Commission must then carefully construct an X-factor. In constructing the appropriate X-factor several issues should be considered, the first of which is that, outside of recalibration periods, the X-factor must be decoupled from providers' realized provision costs. If the X-factor were to be linked to realized costs, then the price cap rate would, for all intents and purposes, be equivalent to a cost-based rate. This would negate providers' incentives to cut costs and undermine the goals of price cap methodology. The information gained by regulators with respect to cost efficiencies should be taken into account only during predetermined recalibration periods.

The second issue to consider when constructing an X-factor is that being overly aggressive may be counterproductive. A price cap methodology is intended to allow providers to retain a portion of the short-run gains from their efficiency enhancing activities. The purpose of the X-factor is to capture the remainder of those gains and redistribute them to the payers. It is unlikely that regulators have enough information to perfectly set the X-factor to capture all of those gains. Indeed, if such information were available, a price cap methodology would not be necessary. Because it is unlikely that regulators can set an X-factor ex ante that perfectly reflects ex post realized efficiency gains, it is important to understand the relative consequences of selecting an overly aggressive X-factor versus setting an under-aggressive X-factor. If the X-factor is lower than realized efficiency gains (under-aggressive), the result will be that providers retain higher short run earnings than intended. However, such issues can be rectified in the recalibration period, which will prevent any long-run ill effects. In contrast, if the X-factor is higher than realized efficiency gains (over-aggressive), providers will become unprofitable and exit the market. This damage to the market structure is unlikely to be rectified in the recalibration period. Indeed, as discussed in the previous section, events in the IP Relay market suggest that the damage caused by over-aggressive rate reductions may never be repaired. Because the long-run consequences of being overly aggressive in setting an X-factor exceed those of being conservative, it would be rational to err on the side of setting a conservative X-factor. Ultimately, it is important that an X-factor not be aspirational, but rather reflect a realistically achievable path of efficiency gains.

When constructing the X-factor, it is also important to recognize that it is not intended to account for monumental or unpredictable shifts in efficiency. The effects of such shifts can be accounted for ex post through the recalibration process further discussed in the next subsection, or they can be mitigated ex ante by compartmentalizing anticipated monumental shifts. For example, if the IP CTS market is treated as one cohesive market including both Automatic Speech Recognition-only ("ASR-only") calls and Communications Assistant-assisted ("CA-assisted") calls, it may be difficult to set an appropriate X-factor given the potentially monumental and unpredictable efficiency gains that may be driven by ASR, once that technology becomes functionally equivalent to CA-assisted calls and appropriate quality standards are implemented. Moreover, since ASR has the potential to cause substantial shifts in efficiency, the ill effects of employing an inappropriate X-factor may be amplified. Relying on an underestimated X-factor will result in substantial over-payment to providers as they realize the efficiency gains of ASR faster than anticipated, while relying on an overestimated X-factor will result in providers incurring substantial losses as they realize the efficiency gains of ASR slower than anticipated. A natural way to mitigate this issue is to have separate and unrelated rates for ASR-only calls and CA-assisted calls. This would allow regulators

to take advantage of the predictability of efficiency gains on the CA-assisted side while limiting the risk exposure that stems from the unpredictable efficiency path of ASR technology to only the ASR side of the market.

Another consideration when constructing a price cap methodology relates to how exogenous costs should be treated. Exogenous costs are typically thought of as costs outside the control of providers. However, in the context of a price cap rate methodology, a slightly narrower definition is required. This is because some costs that would otherwise be considered exogenous are captured by other elements of the rate methodology.[28] Hence, for the purposes of a price cap methodology, exogenous costs may be better thought of as those costs that are outside the control of providers and not effectively accounted for through other components of the methodology. Within that definition, exogenous costs can be further categorized as one-time exogenous costs and recurring exogenous costs.

From an economic perspective, there is not a generalized answer as to whether exogenous costs should be compensated on top of the price cap rate or if they should be anticipated and incorporated into the price cap rate.[29] Exogenous costs will ultimately be borne by the payers, whether that is through the separate direct compensation of exogenous costs plus the associated opportunity cost,[30] or through increased price cap rates that include the expectation of exogenous costs, the appropriate opportunity cost, and the appropriate risk premium.[31] The question of

---

[28] For example, the economy-wide average wage rate may increase, requiring providers to increase their labor expenditures. This may be thought of as an exogenous cost; however, it is also a component of inflation. So long as inflation is independently accounted for (*e.g.*, not linked to the X-factor) in the price cap methodology, it may be inappropriate to count increased wages as an exogenous cost.

[29] Of course, if exogenous costs are not separately compensated, the price cap rate must be high enough to compensate for expected (average) exogenous costs and an appropriate risk premium.

[30] Note that in addition to reimbursing providers for explicit exogenous costs, it is also necessary to reimburse them for the associated implicit costs. This is because a provider, in diverting its capital away from otherwise productive use in order to cover exogenous IP CTS provision costs, must either forego the earnings that it would have realized in the absence of exogenous IP CTS provision cost, or incur the cost of acquiring additional capital. Applying an appropriate margin to the reimbursable exogenous costs will, in principal, defray a provider's opportunity cost. It is also important to note that failing to reimburse providers for the opportunity cost associated with exogenous costs will effectively reduce providers' margin relative to its capital expenditures, making IP CTS a less attractive business opportunity for providers.

[31] The risk premium is the additional cost that stems, not directly from the exogenous costs themselves, but from ex-ante uncertainty with respect to the ex-post, realized level and variation in exogenous costs. If an allowance for expected exogenous costs is built in to the price cap rate, payers do not directly bear the risk; instead providers bear the risk associated with realized exogenous costs differing from the allowance, and such risk imposes a cost on providers (the risk premium). Payers must compensate providers for this risk premium. Alternatively, if exogenous costs are reimbursed on top of the price cap rate, payers will directly bear the risk of uncertainty and variability in realized exogenous costs.

whether exogenous costs should be paid for separately or included in the price cap rate in this instance depends on which group (providers or payers) is situated to most efficiently bear that risk. That is, it depends on if the additional cost associated with the risk (the risk premium) is smaller when the risk is borne by providers or when it is borne by payers.

Because payers are a more dispersed and diversified group than providers, economic intuition indicates that payers may be better able to efficiently bear the direct risk. Given that, it would be less costly to the TRS Fund for providers to be reimbursed separately for exogenous costs than it would be to build an allowance for average exogenous costs plus a risk premium into the rate. However, to the extent that an exogenous cost begins to recur with predictable regularity, it may be appropriate to adjust rates during the recalibration period to reflect such costs in order to simplify the reimbursement process.

A timely example of potential exogenous costs lies in the Commission's current discussion and potential rulemaking related to a User Registration Database for IP CTS.[32] The purpose of such a database would be to certify users' eligibility to utilize IP CTS services. To that end, providers would need to collect information on all current users, and continue to collect data as new users take up the service. Hence, the costs associated with collecting this data would likely represent both recurring and one-time exogenous costs.[33] A reasonable approach to compensating providers for their exogenous data collection costs in this case would be to initially reimburse those costs separate from the price cap reimbursement rate in order to cover the one-time upfront cost of registering all existing users. Once existing users are registered and the cost of registering new users and maintaining the database is well established, the price cap rate should be adjusted upward to reflect those costs. Note, however, that such an adjustment must be made in the recalibration period, and in the interim providers should continue to be separately compensated for all relevant data collection costs.

Another example of exogenous cost might be an increase in the federal minimum wage.[34] Such an increase would likely result in an instantaneous increase in costs faced by providers, as labor is the

---

However, since providers are not bearing this risk, payers need not reimburse providers for the risk premium. Nevertheless, there is an implied internal cost faced by payers related to the risk.

[32] See *e.g.*, "FCC Fact Sheet: Measures to Improve Program Management and 911 Call Handling for Internet Protocol Captioned Telephone Service," Federal Communications Commission, January 3, 2019, accessed January 15, 2019, https://docs.fcc.gov/public/attachments/DOC-355847A1.pdf.

[33] The costs are clearly exogenous under the definition discussed above as they are outside the control of providers and not accounted for through other aspects of the price cap methodology.

[34] Although, based on the theoretical relationship between wage levels and inflation, one might draw the conclusion that increases to the minimum wages would be partially reflected in the inflation factor, this would likely not be a relevant concern in the context at hand. While in principle there may be a relationship between the minimum wage and inflation that could influence the inflation factor under the price cap regime, there is general disagreement about how and if such a relationship might manifest itself. Moreover, the existing empirical research predicts that changes to the minimum wage would have

primary source of provision costs. Therefore, it would be appropriate to reimburse the immediate exogenous changes in provision costs relating to minimum wage. Moreover, since an increased minimum wage represents a persistent change in costs, it may be appropriate to adjust the price cap base rate in the subsequent recalibration period to reflect such a change.

D. Recalibration

As previously discussed, regulators may not have enough information to set the X-factor in a way that perfectly corresponds to realized efficiency gains. Allowing for recalibration at predetermined intervals provides regulators a chance to use the information revealed by providers to correct the rate path. This is not to suggest that the X-factor or base rate will always need to be corrected. If regulators set an X-factor that accurately reflected and continues to reflect the rate of efficiency gains, there may be no reason to recalibrate it. Likewise, depending on how exogenous costs are treated, there may be no reason to adjust the base rate if the rate at the time of recalibration appropriately reflects costs and a reasonable rate of return.[35]

However, irrespective of whether recalibration is ultimately enacted, the opportunity for recalibration should only be presented at predetermined times with sufficiently large intervals between. To incentivize providers to engage in potentially costly efforts to increase efficiency, rates need to be stable and predictable so that providers will be assured some reward for those efforts. The ability to unexpectedly recalibrate rates undermines the stability and predictability of rates and discourages providers from engaging in efficiency enhancing investments.

Similarly, it is necessary to have a sufficiently long time period between recalibrating rates in order for the price cap method to elicit efficiency enhancing behavior. This is because if rates are too quickly recalibrated based on providers' costs, then the price cap rate will devolve into a cost-based rate. Providers will realize that any earnings from the efficiency they are able to gain will simply be recalibrated away in the near future. The exact interval between recalibration periods should

---

relatively small and gradual effects on inflation, if any. Hence, such a relationship is likely not a relevant concern when considering a contemporaneous adjustment for exogenous costs. As a result, short term adjustments made in response to changes in the minimum wage should be done through an exogenous costs reimbursement. To the extent that a change in the minimum wage does ultimately affect the inflation factor, those (likely small) changes will be borne out in the subsequent recalibration period. For an overview of relevant research, see *e.g.*, John Schmitt, "Why does the minimum wage have no discernible effect on employment," Center for Economic and Policy Research 22 (2013): 1-28, https://www.takeactionminnesota.org/wp-content/uploads/2013/10/Why-Does-the-Minimum-Wage-Have-No-Discernible-Effect-on-Employment.pdf. See also, "A Survey of the Effects of the Minimum Wage on Prices," Journal of Economic Surveys 22, no. 1 (2008): 187-212, accessed January 25, 2019, https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-6419.2007.00532.x.

35 If exogenous costs are incorporated into the base rate, then the base rate will clearly need to be periodically adjusted to accurately reflect expectations. If exogenous costs are compensated for separately, they would likely not factor into the recalibration of the base rate.

be based on the optimal trade-off between incentivizing further efficiency gains in the long-term and reallocating the gains from realized efficiency gains to payers in the short-term. Longer intervals between recalibration periods will strengthen the incentives of providers to cut costs, as they can reap the benefits of doing so for longer. This may also delay the redistribution of some of those gains to payers. Alternatively, a shorter interval between recalibration periods will weaken providers' incentives to cut costs, but will also result in the gains from efficiencies being redistributed to payers more quickly. In sum, the trade-off is between potentially higher cost savings that are transferred to payers later in time versus lower costs savings that are transferred to payers earlier in time. While the optimal interval depends on a number of factors that may not be observable to regulators, intervals of three to five years may be reasonable.[36]

Because recalibration may not be required in every recalibration period, performing a cost study in every recalibration period may be wasteful. An alternative approach is to adopt a two-step process, whereby at the beginning of a recalibration period, certain benchmarks are examined through a notice and comment process to establish whether a recalibration is warranted. If those benchmarks imply the X-factor or base rate may no longer be consistent with realized efficiency gains, then a cost study would be initiated in order to establish the correct recalibration.

As an example, provider costs could be split into major categories such as labor, telecommunications, and overhead. Benchmarks can then be identified for those categories such as a labor productivity index or the Producer Price Index for wireless telecommunications carriers, nonresidential real estate rents, and utilities.[37] If, during the recalibration period, those indices indicate a rate of efficiency gain that is inconsistent with the current X-factor or base rate, a cost study would be initiated. That cost study will reveal the average annual realized efficiency gains, and a new X-factor and base rate can be constructed based on that information. If the indices do not indicate any inconsistency between the realized efficiency gains and the X-factor or base rate, then no cost study would be conducted. In this case, the X-factor would remain unchanged until the next recalibration period, and the base rate would continue along the same path.

---

[36] For example, the majority of U.S. states utilized price cap regulation in 2003 and typically employed recalibration periods of between four and five years. See David E.M. Sappington and Dennis L. Weisman, "Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry?" Journal of Regulatory Economics 38 (2010): 233-234, accessed November 13, 2018, https://bwl.univie.ac.at/fileadmin/user_upload/lehrstuhl_ind_en_uw/lehre/ws1112/Energy_Seminar_2/PriceCapsSapp.pdf.

[37] "Producer Price Index for Wireless Telecommunications Carriers (NAICS 517312)," U.S. Bureau of Labor Statistics, July 12, 2018, accessed November 9, 2018, https://www.bls.gov/ppi/ppinaics51721.htm; U.S. Bureau of Labor Statistics, "Producer Price Index by Commodity for Real Estate Services: Nonresidential Real Estate Rents [WPU4311]," FRED, Federal Reserve Bank of St. Louis, updated November 9, 2018, accessed November 13, 2018, https://fred.stlouisfed.org/series/WPU4311; U.S. Bureau of Labor Statistics, "Producer Price Index by Industry: Utilities [PCU221221]," FRED, Federal Reserve Bank of St. Louis, updated November 9, 2018, accessed November 13, 2018, https://fred.stlouisfed.org/series/PCU221221.

III. Proposed Rate Methodology

Based on the discussion in the previous section, a reasonable proposal for price cap rates pertaining to CA-assisted calls is:

$$PCR_t = PCR_{t-1} * (1 + GDPPI_t - X)$$

Where,

PCR_t = *The price cap rate in the current time period*;

PCR_{t-1} = *The price cap rate in the previous time period*;

$GDPPI_t$ = *The inflation between time* $t-1$ *and* t;

X = 1.1% (*the* $X-factor$);

PCR_1 = *The initial PCR in the first time period.*

In other words, the proposed rate structure starts with an initial reimbursement rate.[38] At the beginning of every rate-year, the rate is adjusted to reflect inflation as measured by the GDPPI, less 1.1% in anticipation of efficiency gains (the X-factor).[39]

The X-factor should remain at 1.1% for four years. After four years and at every subsequent interval of four years, the X-factor and base rate can be examined through a two-step process designed to promote long run rate predictability. The first step of that process is to determine if there is sufficient reason to believe the X-factor or base rate is inconsistent with realized efficiency gains. This can be achieved through a notice and comment process, but should rely on evidentiary guidelines for determining if recalibration is necessary. Suggestions for those guidelines are discussed in Section III.D. If it is determined that there is insufficient evidence to indicate an inconsistency between the current X-factor or base rate and realized efficiency gains, then the both will remain the same until the next recalibration period.

However, if step one reveals that the current X-factor is inconsistent with realized efficiency gains, then step two will be to conduct a cost study. In this step, providers will be required to submit their provision costs. The appropriate accounting and reporting standards for those costs should be detailed and explicit to ensure consistency over time and between providers. The Fund

[38] As explained below in Section III.A, the 2017-2018 MARS rate of $1.9467 is a reasonable initial rate.

[39] 1.1% is equal to the average rate of change in reported provision costs between 2016 and 2019, adjusted for inflation. See Section III.C for further discussion.

Administrator will examine reported costs of all providers and calculate the rate of efficiency gain over recent years.[40] Comparing realized efficiency gains to the X-factor will indicate the likely direction of recalibration that is needed, but it may not fully inform the magnitude. Ultimately, the recalibration will need to be based on judgments with respect to how well past efficiency gains can be expected to correlate with future efficiency gains. The results of the cost study could also lead to a one-time adjustment to the base rate.

The reasoning behind the specific attributes of this proposed rate is discussed in the following subsections. A set of example calculations for the next four years are illustrated in Table 1. These calculations use the initial price cap (PCR_1) of $1.9467, an X-factor of 1.1%, and assume a range of GDPPI inflation rates for illustrative purposes.

Table 1: Example Rate Calculations

Rate Year	New Rate		Old Rate	GDPPI	X-Factor
2018-2019	$ 1.9467				
2019-2020	$ 1.9350	=	$1.9467 x (1 +	0.5% -	1.1%)
2020-2021	$ 1.9350	=	$1.9350 x (1 +	1.1% -	1.1%)
2021-2022	$ 1.9389	=	$1.9350 x (1 +	1.3% -	1.1%)

Notes: GDPPI values have been selected to show a range of outcomes and are for illustrative purposes only.

A. Starting Point

The 2017-2018 MARS rate of $1.9467 is an appropriate starting point for a price cap methodology because it is the last Commission-adopted IP CTS rate that was based on a competitive process. Because the MARS rate is based on a competitive process, it directly relates to true provision costs and is therefore not arbitrary nor reliant on an incomplete or inaccurate accounting of provision costs. Moreover, the 2017-2018 MARS rate has proven to be sustainable under very recent market conditions and is therefore likely to be sustainable in the near future.

While there will likely be market uncertainty and perhaps disruption with any initial rate less than the 2017-2018 MARS rate, a rate below $1.763 will almost certainly be disruptive and should therefore be the lower bound of consideration. This is so for several reasons. First, $1.763, the MARS rate for the 2011-2012 rate year, is the last market-based rate that was not contested as being market-based and hence reflective of provision costs.[41] It is likely that at the time, $1.763 did not overcompensate providers, as it was derived from competitive market rates – a notion that

[40] See Section III.D for further discussion.

[41] *Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Structure and Practices of the Video Relay Service Program,* 26, FCC, Rcd 9972, ¶ 19 (2011).

appears to be broadly accepted. While there has clearly been inflation and gains in efficiency since 2012, the cost data collected by the Fund Administrator suggests that these changes have been roughly offsetting.

Another reason $1.763 is a lower bound for an initial price cap rate is that {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} Notably, the iTRS Advisory Council, also recognizes the potential for substantial market disruption under the interim rate structure.[43] Ultimately, a rate below $1.763 presents a meaningful risk of near term market disruption.

Figure 1 below illustrates how the IP CTS rate would change over time under a price cap methodology using three different starting points: the unadjusted 2011-2012 MARS rate of $1.763, the 2011-2012 MARS rate adjusted for inflation using the GDPPI, and the 2017-2018 MARS rate of $1.9467. The figure uses projected inflation figures from October 2018 Blue Chip Economic Indicators and an X-factor of 1.1%.[44]

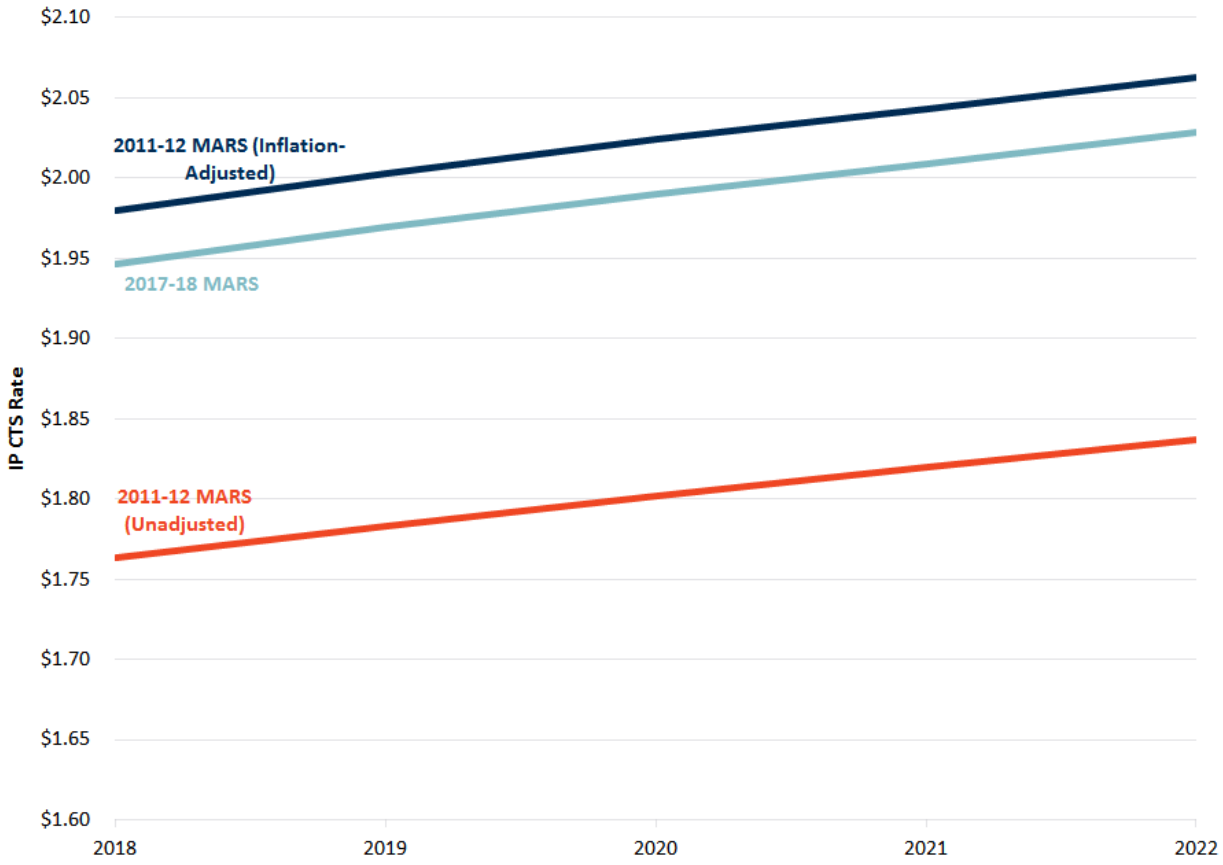
---

[42] {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}}

[43] "For that reason, the scheduled reduction is unrealistic and could cause Providers to 1) Exit the market and 2) Reduce the quality of service to mandatory minimum standards, which is not desirable and would not constitute the quality standards of the functional equivalence of a hearing persons call." See Rolka Loube, Ex Parte Comments, CG Docket Nos. 03-123, 13-24, at 4 (December 4. 2018), https://ecfsapi.fcc.gov/file/1204051341584/Ex%20Parte%20iTRS%20Council%20Comments%20FCC%2018-79.pdf.

[44] See *Blue Chip Economic Indicators* 43(10), October 10, 2018, pp. 3, 14; Section III.C.

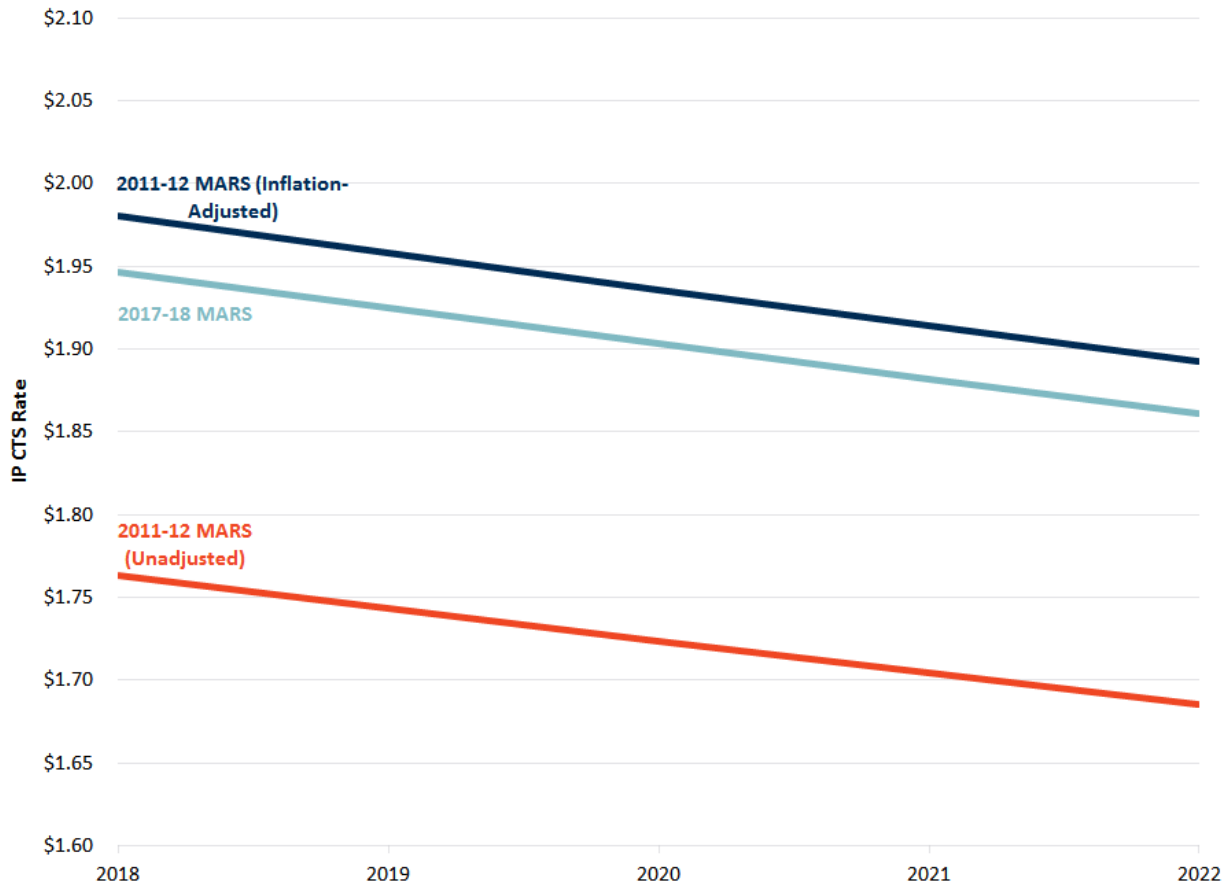
Figure 1: Forecasted IP CTS Compensation Rate under Price Cap Methodology, 2018-2022



Sources & Notes: Future IP CTS rates calculated using price cap methodology with X-factor of 1.1% and projected GDPPI inflation rates from October 2018 Blue Chip Economic Indicators. See U.S. Bureau of Economic Analysis, "Gross Domestic Product: Chain-type Price Index [GDPCTPI]," FRED, Federal Reserve Bank of St. Louis, updated November 28, 2018, accessed November 30, 2018, https://fred.stlouisfed.org/series/GDPCTPI; *Blue Chip Economic Indicators* 43(10), October 10, 2018, pp. 3, 14.

Figure 2 shows the same forecasted rates calculated under the proposed price cap methodology adjusted to be in 2018 dollars. While Figure 1 shows IP CTS rates increasing in *nominal* terms (*i.e.*, not adjusted for inflation), Figure 2 shows that rates are decreasing in *real* terms (*i.e.*, adjusted for inflation).

Figure 2: Forecasted IP CTS Compensation Rate under Price Cap Methodology in 2018 Dollars, 2018-2022



Sources & Notes: Future IP CTS rates calculated using price cap methodology with X-factor of 1.1% and projected GDPPI inflation rates from October 2018 Blue Chip Economic Indicators. 2019-2022 rates adjusted to be in 2018 dollars. See U.S. Bureau of Economic Analysis, "Gross Domestic Product: Chain-type Price Index [GDPCTPI]," FRED, Federal Reserve Bank of St. Louis, updated November 28, 2018, accessed November 30, 2018, https://fred.stlouisfed.org/series/GDPCTPI; *Blue Chip Economic Indicators* 43(10), October 10, 2018, pp. 3, 14.

B. Inflation Factor

An inflation factor is necessary because inflation will increase input prices faced by providers over time in a way that is unrelated to any changes in efficiency gains realized by providers. Said differently, efficiency is measured by changes in real (inflation-adjusted) costs per unit of output. Therefore, if inflation were not separately accounted for, then in addition to the efficiency gains necessitated by the X-factor, providers would implicitly be expected to make up inflation related increases in nominal costs through efficiency gains, even though such changes are unrelated to efficiency.

While the answer to the question of whether inflation should be included in the price cap formula is rather straightforward, the question of how to measure inflation is more nuanced. There exist a

number of metrics that measure inflation, such as the Consumer Price Index ("CPI"), the GDPPI, and the Employment Cost Index ("ECI").[45] These are all measures of changes in aggregated nominal price levels, which makes them valid measures of inflation, but each measures price levels, and hence, inflation, from different perspectives. An appropriate measure of inflation would be one that measures prices that are most applicable to the context in which inflation adjustments are employed.

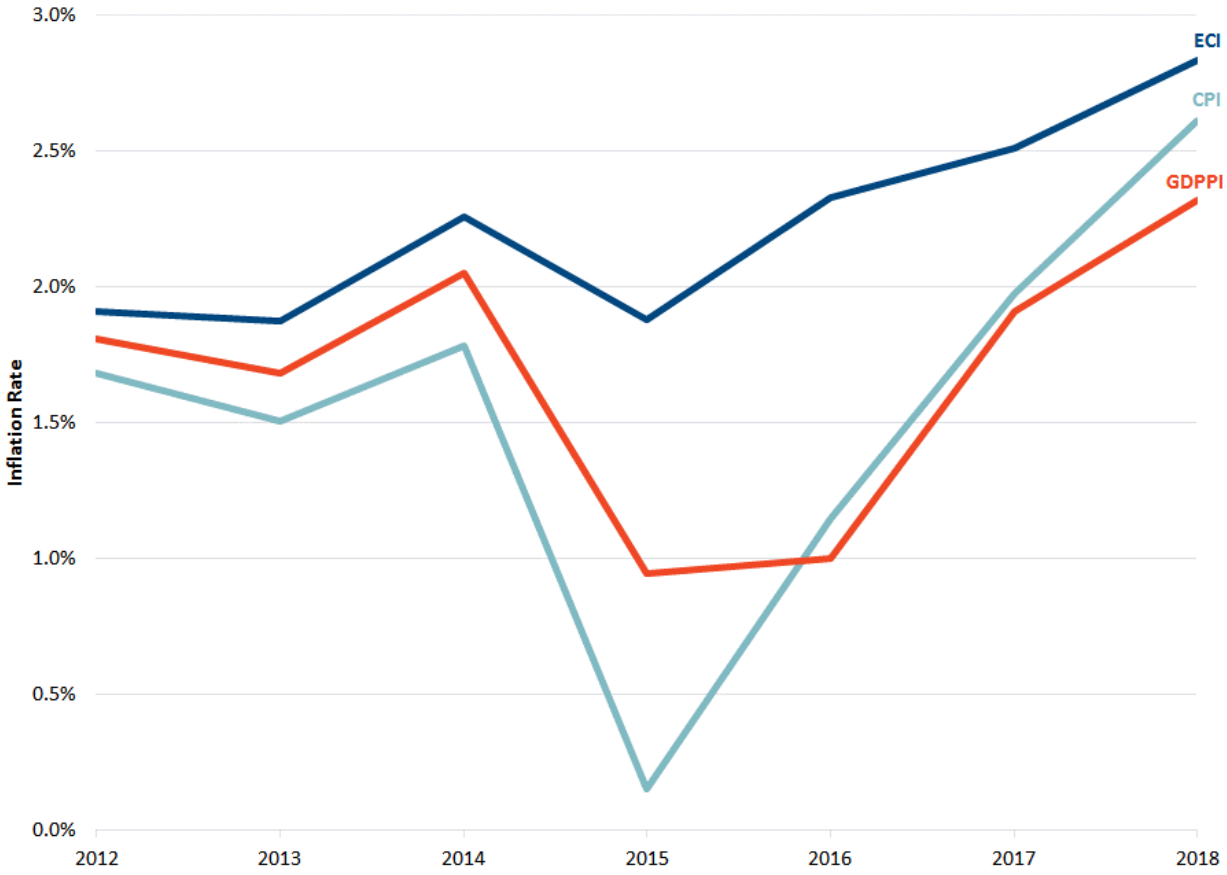
For example, the CPI measures the change in price for a fixed basket of consumer goods. This is the most common measure of inflation in the U.S. However, the CPI measures consumer prices, and the provision costs faced by IP CTS providers are not directly related to consumer prices. For that reason, the GDPPI may be a more appropriate measure of inflation in this instance. That is because the GDPPI not only includes direct consumer prices, but also incorporates business-to-business prices, government purchase prices, and indirect consumer prices.[46] The ECI may also be more appropriate than the CPI since it measures changes in the cost of labor, and the primary production costs in IP CTS are related to labor. Historical CPI, GDPPI, and ECI inflation rates over 2012-2018 are compared in Figure 3 below. In addition to GDPPI being based on appropriate measures of price, it also appears to be a reasonably central, and at times conservative, measure of inflation.

---

[45] The CPI measures changes in the prices of a given basket of goods and services purchased by households in the U.S., while the GDPPI measures changes in the price of goods and services produced in the U.S. The GDPPI includes goods exported to other countries. See "Inflation (CPI)," Organization for Economic Co-operation and Development, 2018, accessed November 9, 2018, https://data.oecd.org/price/inflation-cpi.htm; Bureau of Economic Analysis, "GDP Price Index," U.S. Department of Commerce, October 26, 2018, accessed November 9, 2018, https://www.bea.gov/data/prices-inflation/gdp-price-index. The ECI measures the changes in the cost of labor over time. See "Employment Cost Index Technical Note," U.S. Bureau of Labor Statistics economic news release, October 31, 2018, accessed November 9, 2018, https://www.bls.gov/news.release/eci.tn.htm.

[46] Jonathan D. Church, "Comparing the Consumer Price Index with the gross domestic product price index and gross domestic product implicit price deflator," *Monthly Labor Review*, U.S. Bureau of Labor Statistics, March 2016, accessed November 1, 2018, https://www.bls.gov/opub/mlr/2016/article/comparing-the-cpi-with-the-gdp-price-index-and-gdp-implicit-price-deflator.htm.

Figure 3: Inflation Rates Measured by CPI, ECI, and GDPPI, 2012-2018



Sources & Notes: Inflation rates measured by CPI, ECI, and GDPPI. Rates calculated as the change in inflation measured from July to July. Organization for Economic Co-operation and Development, "Consumer Price Index: Total All Items for the United States [CPALTT01USQ661S]," FRED, Federal Reserve Bank of St. Louis, updated November 23, 2018, accessed November 30, 2018, https://fred.stlouisfed.org/series/CPALTT01USQ661S; U.S. Bureau of Labor Statistics, "Employment Cost Index: Total compensation: All Civilian [ECIALLCIV]," FRED, Federal Reserve Bank of St. Louis, updated October 31, 2018, accessed November 2, 2018, https://fred.stlouisfed.org/series/ECIALLCIV; U.S. Bureau of Economic Analysis, "Gross Domestic Product: Chain-type Price Index [GDPCTPI]," FRED, Federal Reserve Bank of St. Louis, updated November 28, 2018, accessed November 30, 2018, https://fred.stlouisfed.org/series/GDPCTPI.

C. Efficiency Factor

An X-factor is meant to reflect expectations of future efficiency gains and related cost savings in an industry.[47] One possible method of calculating an X-factor for CA-assisted calls would be to examine past gains in cost efficiency that have been realized in IP CTS and project them forward. To that end, Figure 4 below shows IP CTS providers' historical total per-minute costs, adjusted for inflation.[48] These historical costs can be used as a rough proxy for historical efficiency gains in the IP CTS market. However, it is important to note that recent cost trends will likely be a better predictor of future efficiency gains than older cost trends might be. This is true for a several reasons. First, the rate of efficiency gain in an industry often diminishes over time; therefore, predicting future efficiency gains based on efficiency gains that are distant in time may result in an overestimate. Second, there are a number of confounding issues that may mask the level of true efficiency gains in the earlier years of IP CTS cost data collection, which began in 2013. For example, when cost reporting started, there was little guidance with respect to what providers should report as allowable costs.[49] This uncertainty likely led to changes in cost reporting practices over the first few years, resulting in a decrease in *reported* costs, which were unrelated to changes in *actual* costs.

---

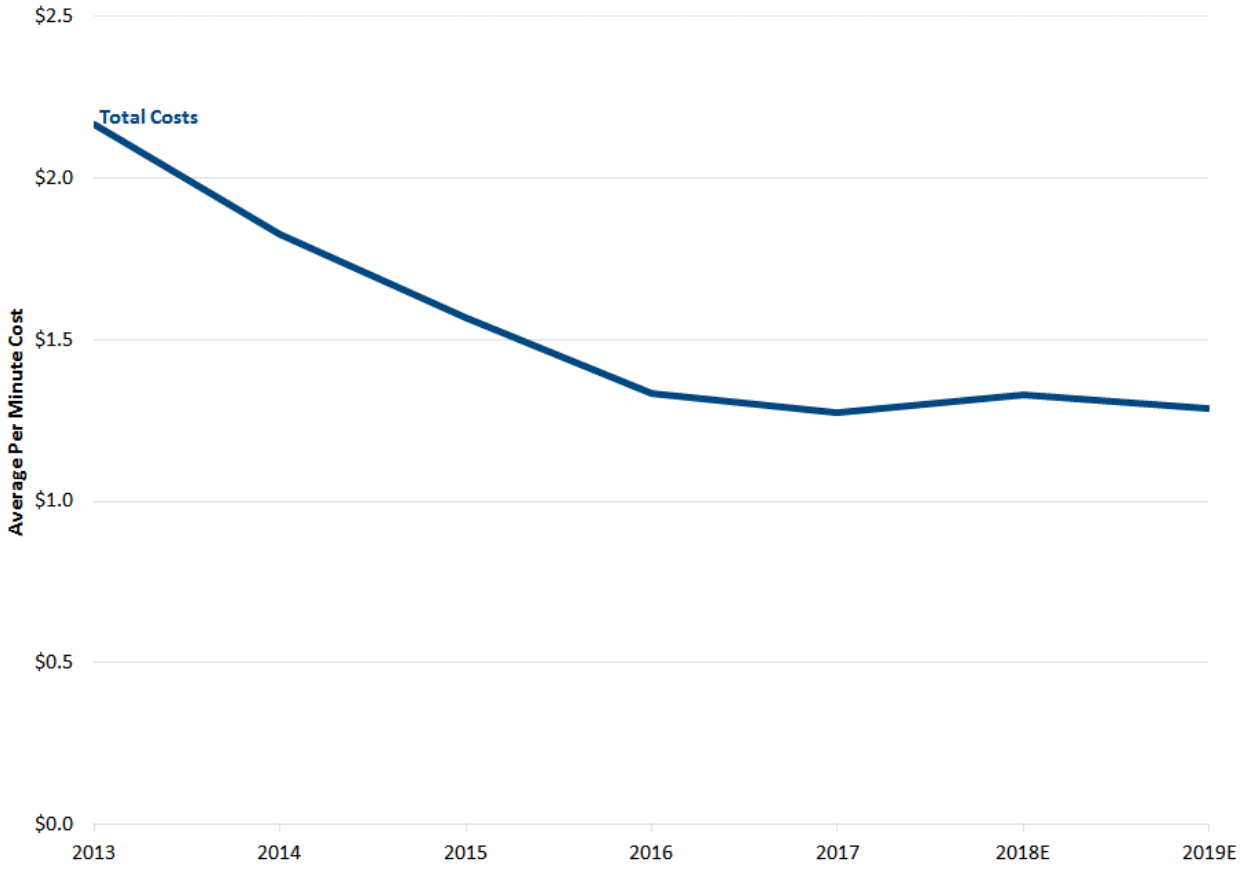
47 Coleman Bazelon, Patrick Holder, and Brent Lutes, "Economic Analysis of IP CTS Provision Costs and Rate Setting," The Brattle Group, CG Docket Nos. 13-24, 03-123, at 5 (filed November 8, 2017) ("November 2017 Brattle Whitepaper").

48 Rolka Loube Associates LLC, Interstate Telecommunications Relay Services Fund Payment Formula and Fund Size Estimate, CG Docket Nos. 03-123 and 10-51, Revised Exhibit 1-3, (filed May 22, 2018) ("2018 Rolka Loube Annual Report, Revised Exhibit 1-3").

Exhibit 1-3 reports historical cost data for 2011 and 2012 as well, but we excluded these years given the contemporaneous unusual and unforeseen volatility of IP CTS minutes in 2012, which resulted in per-minute cost changes that are not necessarily reflective of inflation or efficiency gains. For discussion of this "unprecedented and unusually rapid growth," see, *e.g.*, *Misuse of Internet Protocol (IP) Captioned Telephone Service, Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities*, Order and Notice of Proposed Rulemaking, 28 FCC Rcd 703, ¶¶ 6-8 (2013) (subsequent history omitted).

49 See, *e.g.*, Comments of Sorenson Communications, Inc. and CaptionCall, LLC, CG Docket Nos. 13-24, 03-123, at iii, 12-16 (filed February 26, 2013) (seeking clarification of language in the Commission's interim order barring "any form of direct or indirect inducements… to subscribe to or use or encourage subscription to or use of IP CTS"); and Comments of Hamilton Relay, CG Docket Nos. 13-24, 03-123, at 2-4 (filed February 26, 2013) (seeking similar clarification, with additional specific questions regarding wholesale and retail arrangements).

Figure 4: Historical IP CTS Provider Inflation-Adjusted Total Per-Minute Reported Costs (2018 Dollars) 2013-2019E



Source & Notes: 2018-2019 costs exclude CaptionCall's intellectual property license fee and are projections as of 2018. See 2018 Rolka Loube Annual Report, Revised Exhibit 1-3 and Exhibit 1-3.2. Inflation adjustment to 2018 dollars is calculated using Gross Domestic Product Price Index data from U.S. Bureau of Economic Analysis, "Gross Domestic Product: Chain-Type Price Index [GDPCTPI]," FRED, Federal Reserve Bank of St. Louis, updated November 28, 2018, accessed November 30, 2018, https://fred.stlouisfed.org/series/GDPCTPI; *Blue Chip Economic Indicators* 43(10), October 10, 2018, p. 3.

Ultimately, while there may have been IP CTS efficiency gains in earlier years, as suggested by Figure 4, the magnitude of those gains is likely masked by early inconsistencies in reporting standards and practices. Moreover, it is likely that the rate of efficiency gain has diminished over time, as is often the case in maturing industries. Hence, it would be appropriate to weigh recent and projected changes in costs more heavily when calculating an X-factor. Indeed, we can reasonably expect efficiency gains with respect to CA-assisted calls to maintain the same trend in the near future as they have recently exhibited. Additionally, although the cost levels reported by providers are incomplete representations of true provision costs, those reported costs can still provide information about the rate of efficiency gain. This efficiency gain is measured by the year-over-year change in costs, not the level of costs. So long as costs are incomplete in a consistent way over time and unreported costs correlate to reported costs, the rate of change in reported costs will

be accurate. Given such an expectation, a reasonable X-factor would be one based on reported costs in 2016 through 2017 and expected costs for 2018 and 2019. This produces an X-factor of 1.1%, as illustrated in Table 2 below.

Table 2: Calculation of Proposed X-Factor

	Year	Total Per-Minute Cost	% Change
		[A]	[B]
[1]	2016	$ 1.3326	
[2]	2017	$ 1.2738	-4.4124%
[3]	2018E	$ 1.3272	4.1922%
[4]	2019E	$ 1.2879	-2.9611%
	Average Annual Cost Efficiency Gain		
[5]	2016-2019E	$ 0.0149	1.1%

Sources & Notes: 2018-2019 data exclude CaptionCall's intellectual property license fee. Reported 2018 and 2019 costs are estimates as of 2018.

[A][1] - [A][4]: Inflation-adjusted total per-minute IP CTS costs in 2018 dollars using GDPPI. Because of differences in reporting practices for measures of realized inflation and projected inflation, values for forward-looking inflation are on a calendar year basis and values for backward-looking inflation are on an April-to-April basis. See U.S. Bureau of Economic Analysis, "Gross Domestic Product: Chain-Type Price Index [GDPCTPI]," FRED, Federal Reserve Bank of St. Louis, updated September 27, 2018, accessed October 12, 2018, https://fred.stlouisfed.org/series/GDPCTPI; Blue Chip Economic Indicators, October 10, 2018, p. 3. .

[B][1] - [B][4]: Cost minus cost in previous time period divided by cost in previous time period.

[A][5]: ([A][1] - [A][4])/3.

[B][5]: Geometric mean of rate of change. 1.1% = 1 - ((1 + [B][2]) x (1 + [B][3]) x (1 + [B][4]))^(1/3).

Note that CaptionCall has also proposed a price cap methodology, with the X-factor equaling annual inflation.[50] Nevertheless, the X-factor should be based on a method more scientific than simply assuming efficiency gains are equal to inflation. Moreover, linking the X-factor to the inflation rate undermines the goal of generating a stable and predictable real rate. Instead, the real rate is subject to exogenous fluctuations in inflation that are unrelated to providers' ability to achieve efficiency gains. CaptionCall's lack of economic justification notwithstanding, its proposal would produce an X-factor of similar magnitude to that discussed above. Indeed, based on recent inflation, CaptionCall's method would imply an X-factor of approximately 1.91%.[51]

[50] CaptionCall Initial Comments, p. 60.

[51] This inflation rate is the actual inflation based on GDPPI for 2016-2017. GDPPI data from U.S. Bureau of Economic Analysis, "Gross Domestic Product: Chain-Type Price Index [GDPCTPI]," FRED, Federal

D. Recalibration Periods

As previously discussed, a typical interval between recalibration periods is three to five years.[52] However, it is important to select a specific interval length (as opposed to selecting a range of time in which recalibration could occur) to maintain stability and predictability in the ratemaking process. Consequently, the recalibration period should balance the predictability of longer time periods against the cost of an inaccurate X-factor. In many settings, three to five years has provided such balance. However, in the absence of compelling evidence to suggest which end of the range should be targeted in the case of IP CTS, a reasonable course of action may be to select an interval length at the midpoint of the typical range. This suggests an interval length of four years.

As discussed above, the recalibration of the X-factor should be a two-step process. In the first step, there will be a notice and comment process for determining whether or not there is sufficient evidence to warrant a change in the X-factor. Although this process need not be restrictive, it may be useful to provide guidelines for what type of evidence would be credible and indicative of the need for recalibration. For example, a substantial change in the trend of labor productivity, as measured by the U.S. Bureau of Labor Statistics' Labor Productivity and Costs index, may indicate that the previous X-factor is no longer consistent with efficiency gains. Alternatively, the Producer Price Indices for wireless telecommunications carriers, nonresidential real estate rents, and utilities industry could also be compared. Additionally, some market changes may indicate a need for recalibration. For example, reoccurring exogenous costs may have come to light during the price cap period and may require adjustment to incorporate such costs.

If evidence suggests that there is reason to believe the X-factor or base rate should be recalibrated, providers and the Fund Administrator would engage in a systematic cost study in order to determine whether and by how much the X-factor should be adjusted. Costs should be measured as completely and consistently as possible and should represent provision costs for at least the previous two years. Once costs have been reported, they can be distilled into a measure of the weighted average. It is important to note, however, that as previously discussed, reported costs tend to be an inaccurate and incomplete measure of true provision costs. Therefore, recalibration should be based on the rate of change in reported costs, not on the level of reported costs. This circumvents the need for reported costs to be *equal* to actual provision costs and only requires changes in reported costs be *proportional* to changes in actual costs.

Reserve Bank of St. Louis, updated November 28, 2018, accessed November 30, 2018, https://fred.stlouisfed.org/series/GDPCTPI.

[52] As discussed in Section II.B, the Commission set recalibration periods at three-year intervals for IP Relay. Additionally, the majority of U.S. states utilized price cap regulation in 2003 and typically employed recalibration periods of between four and five years. See David E.M. Sappington and Dennis L. Weisman, "Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry?" *Journal of Regulatory Economics* 38 (2010): 233-234, accessed November 13, 2018, https://bwl.univie.ac.at/fileadmin/user_upload/lehrstuhl_ind_en_uw/lehre/ws1112/Energy_Seminar_2/PriceCapsSapp.pdf.

In practical terms, when considering recalibration to set:

X = The new X-factor; and

B = The new base rate.

The Commission should examine:

$\hat{X}$ = The X-factor set in the previous recalibration period;

$\hat{B}$ = The base rate set in the previous recalibration period;

Δ = The rate of change in reported provision cost between the past two years, adjusted for inflation;[53]

$\hat{\Delta}$ = The average rate of change between the reported provision costs in the previous recalibration period and the current recalibration period, adjusted for inflation;

C = The weighted average reported cost in the current recalibration period;

$\hat{C}$ = The weighted average reported costs in the previous recalibration period, adjusted for inflation.

From the comparison of these measures several conclusions can be drawn:

1. Comparing C and $\hat{C}$ to $\hat{X}$:
    a. If $\hat{X}$ was an accurate prediction of average efficiency gains since the previous recalibration period, it will be the case that current costs are equal to costs in the previous recalibration period reduced by the X-factor three times over,[54] or $C = \hat{C}(1-\hat{X})^3$.
    b. If $C > \hat{C}(1-\hat{X})^3$, the X-factor overestimated potential efficiency gains indicating that the X-factor may need to be decreased depending on the relationship between Δ and $\hat{\Delta}$ (see discussion below) and the base should be increased.
    c. If $C < \hat{C}(1-\hat{X})^3$, the X-factor underestimated potential efficiency gains indicating that the X-factor may need to be increased depending on the relationship between Δ and $\hat{\Delta}$ (see discussion below) and the base rate should be decreased.
    d. The base rate should change proportional to the change in inflation-adjusted reported costs. That is, $B = \hat{B} * \frac{C}{\hat{C}}$.
2. Comparing Δ_t and Δ_{t-4} to $\hat{X}$:

[53] A positive rate value here indicates that efficiency has increased, *i.e.*, costs have decreased, while a negative value indicates that efficiency has decreased, *i.e.*, costs have increased.

[54] In a rate structure that allows for four years between recalibration periods, the rate will be reduced by the X-factor three times before the next recalibration period begins.

a. If $\Delta > \hat{X}$ and $\hat{\Delta} > \hat{X}$, the X-factor has underestimated potential efficiency gains, and the Commission should consider increasing the X-factor and decreasing the base rate.
b. If $\Delta < \hat{X}$ and $\hat{\Delta} > \hat{X}$, the X-factor may have overestimated recent efficiency gains but has underestimated initial efficiency gains. The Commission should consider decreasing the X-factor to better reflect more recent trends but may need to also decrease the base rate to account for an X-factor that was too small in earlier years.
c. If $\Delta < \hat{X}$ and $\hat{\Delta} < \hat{X}$, the X-factor has overestimated potential efficiency gains, and the Commission should consider decreasing the X-factor and increasing the base rate.
d. If $\Delta > \hat{X}$ and $\hat{\Delta} < \hat{X}$, the X-factor may have underestimated recent efficiency gains but has overestimated initial efficiency gains. The Commission should consider increasing the X-factor to better reflect more recent trends but may also need to increase the base rate to account for an X-factor that was too large in earlier years.

Select examples illustrating how to analyze the relationships described above are provided in Table 3 below.

Table 3: Example Recalibration Analysis

	Base Rate in Prev. Recal. Period ($\hat{B}$)	X-Factor in Prev. Recal. Period ($\hat{X}$)	Cost in Prev. Recal. Period ($\hat{C}$)	Cost in Current Recal. Period (C)	Rate of Change Since Prev. Recal. Period ($\hat{\Delta}$)	Rate of Change in Prev. Two Years (Δ)	Implications	Explanation
[1]	$1.9467	1.1%	$1.8000	$1.7413	1.1%	1.1%	**No recalibration needed for the base rate**	The cost in the current recalibration period is equal to the cost in the previous recalibration period reduced by the X-factor three times over ($1.7413 = $1.8000 x (1 - 1.1%)^3). This implies that the current base rate is consistent with the reduction in reported costs and does not need recalibration.
							No recalibration needed for the X-factor	Both the average rate of change since the last recalibration period and the recent rate of change in the last two years indicate that the X-factor has been and remains an accurate predictor of efficiency gains. Therefore the X-factor need not be recalibrated.
[2]	$1.9467	1.1%	$1.8000	$1.6500	2.8%	1.1%	**Likely need to reduce the inflation-adjusted base rate to $1.7845**	The cost in the current recalibration period is lower than the cost in the previous recalibration period reduced by the X-factor three times over ($1.6500 < $1.8000 x (1 - 1.1%)^3). This implies that actual cost reductions have outpaced predicted cost reductions, and the base rate may need to be reduced. An appropriate new base rate would be $1.7845 = $1.9467 x ($1.6500 / $1.8000)
							No recalibration needed for the X-factor	While the average rate of change since the last recalibration period is greater than the X-factor, the rate of change between the last two years is equal to the X-factor. This implies that the X-factor was an underestimate of initial efficiency gains, but the recent rate of efficiency gain has slowed down such that the X-factor appears to be an accurate predictor. Therefore, the X-factor will likely not need to be recalibrated.
[3]	$1.9467	1.1%	$1.8000	$1.7413	1.1%	0.5%	**No recalibration needed for the base rate**	The cost in the current recalibration period is equal to the cost in the previous recalibration period reduced by the X-factor three times over ($1.7413 = $1.8000 x (1 - 1.1%)^3). This implies that the current base rate is consistent with the reduction in reported costs and does not need recalibration.
							X-factor may need to be reduced	While the average rate of change since the last recalibration period is equal to the X-factor, the rate of change between the last two years is less than the X-factor. This implies that the X-factor was an underestimate of initial efficiency gains, but the recent rate of efficiency gain has slowed down such that the X-factor now appears to be an overestimate of efficiency gains. Therefore, the X-factor will likely need to be reduced. Although other issues will also inform the recalibration of the X-factor, an appropriate point of departure is the 0.5% efficiency gain observed in the last two years.
[4]	$1.9467	1.1%	$1.8000	$1.7900	0.2%	0.2%	**Likely need to increase the inflation adjusted base rate to $1.9359**	The cost in the current recalibration period is higher than the cost in the previous recalibration period reduced by the X-factor three times over ($1.7900 > $1.8000 x (1 - 1.1%)^3). This implies that actual cost reductions have outpaced predicted cost reductions, and the base rate may need to be reduced. An appropriate new base rate would be $1.9359 = $1.9467 x ($1.7900 / $1.8000)
							X-factor may need to be reduced	The average rates of change since the last recalibration period and the rate of change between the last two years are less than the X-factor. This implies that the X-factor was an overestimate of efficiency gains. Therefore, the X-factor will likely need to be reduced. Although other issues will also inform the recalibration of the X-factor, an appropriate point of departure is the 0.2% efficiency gain observed in the last two years.

Notes: Values used in this table are for illustrative purposes only. "Costs" refer to the weighted average provision costs of providers.

IV. Cost-Based Ratemaking is Inappropriate for IP CTS

Cost-based ratemaking has been suggested as a possible replacement for the MARS methodology. We have discussed in previous papers why such an approach is not economically sound for this industry.[55] Generally, incentivizing cost reductions requires avoiding links between costs and reimbursement rates. Though this point may initially seem counterintuitive, the logic behind it is that providers care about costs and reimbursement rates (*i.e.*, revenue) insofar as they affect profits.[56] Profits increase when the difference between costs and reimbursement rates (revenue) increase. Therefore, if providers' revenues are linked to costs, they have less of an incentive to reduce those costs since doing so would also reduce revenue, and hence circumvent the profits that would otherwise flow from a cost reduction. Cost-based rates therefore do not incentivize efficiency gains, given that any such gains could lower revenue proportional to potential cost savings. Moreover, to the extent that it is costly to seek out efficiency gains and those costs are not reimbursed, providers may be explicitly disincentivized from becoming efficient under a cost-based rate.

Both the FCC and the Fund Administrator have, at times, expressed support for a cost-based reimbursement rate methodology. Indeed, in its June 6, 2018 Further Notice of Proposed Rulemaking, the FCC proposed "moving to a cost-based rate" for IP CTS providers given its desire to "bring provider compensation more in line with reported provider costs,"[57] and in its most recent TRS Fund annual report, Rolka Loube noted that, while the proposed IP CTS rate for the 2018-2019 rate-year did not reflect a cost-based structure, it believed that "a cost based IP CTS rate… [is] expected to mitigate Fund growth."[58] Rolka Loube previously identified six possible

---

55 Coleman Bazelon & Brent Lutes, "Telecommunications Relay Services for Individuals who are Deaf or Hard of Hearing, Market and Policy Analyses," The Brattle Group, CG Docket Nos. 13-24, 03-123 (filed August 30, 2017) ("August 2017 Brattle Whitepaper"); November 2017 Brattle Whitepaper, p. 13.

56 August 2017 Brattle Whitepaper, p. 25.

57 *Matter of Misuse of Internet Protocol (IP) Captioned Telephone Service, Telecommunications Relay Services for Individuals with Hearing and Speech Disabilities*, Report and Order, Declaratory Ruling, Further Notice of Proposed Rulemaking, and Notice of Inquiry, 33 FCC Rcd 5800, ¶¶ 20-32, 85-93 (2018) ("June 2018 Decision").

58 Rolka Loube Associates, LLC, Interstate Telecommunications Relay Services Fund Payment Formula and Fund Size Estimate, CG Docket Nos. 03-123 and 10-51, at 24 (filed April 30, 2018) ("2018 Rolka Loube Annual Report").

cost-rate methodologies for IP CTS in its 2017 annual report.[59] Of these six proposals, four were variations of linking rates to industry average costs, one proposed setting the rate to the cost of a marginal provider, and another proposed setting the rate for each provider individually based on the given provider's cost of service.[60] While all proposed variations on cost-based rates suffer from a lack of efficiency-enhancing incentives, they also exhibit a structure likely to result in the market exit of some or all providers.

This is because, for example, when rates are based on *average* industry costs, providers with costs exceeding the industry average will be reimbursed at a rate *less* than their costs, which would force them to leave the industry.[61] This would change the basis on which industry average costs are calculated in the future, as some higher cost providers will have left the market. This will result in the average sinking below the costs of more of the remaining providers, forcing them to also exit the market.

Setting the reimbursement rate equal to the costs of the marginal provider, as described in the other Rolka Loube cost-based proposals, would have a long-run impact on the industry similar to that which would arise from setting the rate to average industry costs. Indeed, linking rates to the marginal provider's costs would necessarily make that provider unprofitable, as a firm is by definition unprofitable if its revenues equal its costs.[62] This would result in the market exit of the original marginal cost provider, forcing rates to be set based on the next highest cost provider's costs. That provider would then become unprofitable and exit the market. This process, if allowed to continue, would result in the eventual exit of all providers.

In its recent Further Notice of Proposed Rulemaking, the FCC asserted that multi-year cost based rates (*i.e.*, two-year rate periods) would resolve the problems associated with cost based rates.[63] However, the fact that linking reimbursement to costs disincentivitizes providers from engaging in costly research and development in an effort to reduce costs remains true even in the case of multi-year rates. This is because, in general when reimbursement is linked to costs, providers'

---

59 Each option aside from Options [1] and [8] related to provider costs. Option [1] was to retain the MARS methodology, while Option [8] was to "make no change pending further comment and analysis." See Rolka Loube Associates, LLC, Interstate Telecommunications Relay Services Fund Payment Formula and Fund Size Estimate, CG Docket Nos. 03-123 and 10-51, at 19 (filed April 28, 2017) ("2017 Rolka Loube Annual Report").

60 Options [2], [4], [5], and [6] are each based on industry average cost, Option [3] is based on the cost of a marginal provider, and Option [7] would set the rate of each provider individually based on each provider's costs. See *id*.

61 For more detailed discussion, see August 2017 Brattle Whitepaper, p. 32.

62 Note that Rolka Loube claims that its proposed marginal provider rate is "a little more than the cost of the high-cost provider, [which] would ensure that all providers would stay in the market." However, the profit margin for the marginal provider under this proposal is so low as to be effectively zero. 2017 Rolka Loube Annual Report, p. 21 and Exhibit 1-3.3.

63 *June 2018 Decision*, ¶ 28.

future revenue will decrease if they decrease costs. Hence, the decision faced by providers will be either 1) take the socially optimal level of action to reduce expenses and realize increased margins for the contemporaneous rate period, but decrease the level of returns in all future rate periods or 2) take no action, accept the margins in the contemporaneous period, and maintain higher returns for future periods. While multi-year rates may shift the calculus, unless they are sufficiently long, they will not fully realign incentives. For example, instead of facing the decision of increased margins for one year at the expense of a perpetuated reduction in returns, providers would need to consider increased margins in, say, two years at the expense of the same perpetuates reduction in future returns. The fundamental trade-off providers must consider is enjoying higher profits now versus higher profits in perpetuity.[64]

Many providers have expressed opposition to implementing a cost-based rate methodology.[65] In fact, only three commenters, Telecommunications Equipment Distribution Program Association ("TEDPA"), National Association of Regulatory Utility Commissioners ("NARUC"), and Independent Telephone and Communication Alliance ("ITTA") have expressly advocated for a cost-based compensation rate methodology.[66] TEDPA expressed its support for restructuring IP CTS provider compensation to align with a cost-based rate, but provided no specific arguments for such a rate in its comment.[67] NARUC argued that moving towards cost-based compensation would "assure all consumers pay the lowest possible TRS surcharge and that IP-CTS providers are reimbursed for reasonable costs incurred in providing service" and further argued that this methodology would "discourage unethical sales practices" among IP CTS providers by reducing profits and thereby the incentive to act unethically.[68] ITTA has commented that it believes the Commission should "continue its efforts to bring IP CTS compensation rates down to providers'

---

64 Note that providers face a similar fundamental trade-off under a price cap methodology. For that reason the FCC should set sufficient intervals between price cap recalibrations.

65 See, *e.g.*, CaptionCall Initial Comments, pp. 62-64, 70 at footnote 241; Reply Comments of CaptionCall, Inc., CG Docket Nos. 13-24 and 03-123, Section IV.A (October 16, 2018); Comments of Hamilton Relay, Inc., CG Docket Nos. 13-24 and 03-123, Section I.C (filed September 17, 2018); Reply Comments of Hamilton Relay, Inc., CG Docket Nos. 13-24 and 03-123, Section II.B (filed October 16, 2018); Reply Comments of Sprint Corporation, CG Docket Nos. 13-24 and 03-123, Section III.A (filed October 16, 2018).

66 Note that this excludes providers that advocate for a tiered structure around a cost-based rate methodology, as their advocacy appears to be aimed more at employing tiers and less at what methodology is used to calculate the rates within tiers. Comments of TEDPA, CG Docket Nos. 13-24 and 03-123 at 2 (filed September 14, 2018) ("TEDPA Comments"); Comments of the National Association of Regulatory Utility Commissioners, CG Docket Nos. 13-24 and 03-123 (filed September 17, 2018) ("NARUC Initial Comments"); Reply Comments of the National Association of Regulatory Utility Commissioners, CG Docket Nos. 13-24 and 03-123, at 2 (filed October 16, 2018) ("NARUC Reply Comments"); Comments of ITTA – The Voice of America's Broadband Providers, CG Docket Nos. 13-24 and 03-123, Section III (filed September 17, 2018) ("ITTA Comments").

67 TEDPA Comments, p. 2.

68 NARUC Initial Comments, p. 18; NARUC Reply Comments, p. 2.

actual reasonable costs" and expressed support for the FCC's proposal to move the IP CTS provider compensation rate to a cost-based level.[69] Specifically, ITTA has stated that it would "not object" to the FCC's setting IP CTS rates based on average costs.[70]

These arguments are unsound. As discussed earlier in this section, ITTA's advocacy of a cost-based rate using average rates ignores this methodology's impact on providers with costs exceeding the industry average. Additionally, a cost-based rate would not "assure all customers pay the lowest possible TRS surcharge," as NARUC argues, because that surcharge could be further reduced if providers became more cost efficient. A cost-based rate, however, would either fail to incentivize or actively *disincentivize* providers from becoming more cost efficient; hence the surcharge under a cost based methodology would not be the "lowest possible." NARUC's argument regarding "discourag[ing] unethical sales practices" is similarly unfounded. There does not appear to be any evidence of systemic unethical sales practices in the IP CTS industry, nor does there appear to be any evidence that such practices would represent a substantial portion of IP CTS volume if they did occur. Moreover, unethical sales practices would not, in fact, be discouraged under a cost-based rate. A cost-based reimbursement rate would still be based on the volume of minutes provided; hence there would still be incentive to increase call volume, just as there is today. Any incentive to engage in unethical sales practices would therefore not be directly addressed by implementing a cost-based rate.

Regulators, particularly telecommunications regulators, are well acquainted with the pitfalls of cost-based ratemaking. Indeed, utilization of cost-based rates by state telecommunications regulatory agencies went from 100% in 1985 to 6% by 2007.[71] In other words, 94% of state telecom agencies abandoned cost-based ratemaking over the course of those two decades. Moreover, in addition to state regulators, the FCC has explicitly recognized the shortcomings of using cost-based regulation. For example, in a Notice of Proposed Rulemaking in another matter earlier this year, the FCC stated:

> The Commission has consistently acknowledged that incentive regulation, [in contrast to cost-based regulation], can foster appropriate incentives for carriers to be efficient and to innovate. Under price cap regulation, as opposed to cost-based regulation, carriers have the incentive to become more efficient, to reduce costs, and to innovate as a means of increasing their profits.[72]

---

69 ITTA Comments, pp. 3, 7. See also *id.*, at Section III.

70 ITTA Comments, pp. 12-15.

71 David E.M. Sappington & Dennis L. Weisman, "Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry?" *Journal of Regulatory Economics* 38 (2010): 232 at Table 2, accessed November 13, 2018, https://bwl.univie.ac.at/fileadmin/user_upload/lehrstuhl_ind_en_uw/lehre/ws1112/Energy_Seminar_2/PriceCapsSapp.pdf.

72 The FCC further noted that "an appropriate X-factor and periodic review by the Commission can ensure that carriers share some or all of these efficiencies with their customers." See *Regulation of Business*

This shift is likely due in part to a number of academic studies highlighting the misaligned incentives of cost-based rates (*i.e.*, regulated rate of return pricing or "ROR"). For example, in their empirical study of rate methodologies employed by state telecommunications regulators, Ai & Sappington (2002) show that provision costs are generally higher under cost-based methods.[73] These findings were reaffirmed by an empirical study of residential telecommunications services by Eckenrod (2006).[74] Similarly, in their empirical analysis of telecommunications firms, Seo & Shin (2011) demonstrate that 23 out of 25 firms have lower productivity growth under ROR methods when compared to alternatives, such as a price cap.[75] The economic explanation behind these general results is aptly summarized by CaptionCall's economic expert, Professor Connolly: "a rate set based on provider-submitted costs plus a rate-of-return or margin distorts the incentives to invest in R&D for all participants since the return to successful cost reducing innovation is reduced due to the subsequent endogenous reduction in compensation."[76]

Historically, the utilization of cost-based rates has proven to disrupt markets. Indeed, failed cost-based rates in the natural gas industry were a key factor leading to eventual deregulation of that market. In the 1960s, the Federal Power Commission ("FPC") set prices charged by gas producers based on the average historical costs of production.[77] Over time, however, rates began to bear little resemblance to actual costs and gas producers found it unprofitable to sell natural gas to interstate pipelines. Interstate markets ceased to function, causing excessive gas shortages in the Northeast and Midwest. Subsequent FPC attempts to address this problem through new cost-based regulation only exacerbated the gas shortage. Ultimately, the use of cost-based rates cost consumers and suppliers between $2.5 billion and $5 billion per year throughout the 1970s when they were eventually phased out.

Data Services for Rate-of-Return Local Exchange Carriers, Notice of Proposed Rulemaking, 33 FCC Rcd 4277, ¶ 10 (2018).

73 Chunrong Ai & David E.M. Sappington, "The Impact of State Incentive Regulation on the U.S. Telecommunications Industry," *Journal of Regulation* 22(2) (2002): 148-150.

74 Sarah B. Eckenrod, "Incentive regulation in local telecommunications: The effects on price markups," *Journal of Regulatory Economics* 30 (2006): 226.

75 Daigyo Seo & Jonghyup Shin, "The impact of incentive regulation on productivity in the US telecommunications industry: A stochastic frontier approach," *Information Economics and Policy* 23 (2011): 7 at Table 4.

76 "An Economic Analysis of Internet Protocol Captioned Telephone Service Policy Reform," Michelle Connolly, September 17, 2018, ¶ 12, available as attachment to CaptionCall Initial Comments, Appendix C, https://ecfsapi.fcc.gov/file/10918582811662/PUBLIC%20Comments%20of%20CaptionCall%2C%20LLC%20(9-17-18).pdf.

77 The FPC was later succeeded by the Federal Energy Regulatory Commission ("FERC"). Andrej Juris, "Development of Competitive Natural Gas Markets in the United States," The World Bank Group, Note No. 141, April 1998, pp. 1-2, accessed November 13, 2018, http://siteresources.worldbank.org/EXTFINANCIALSECTOR/Resources/282884-1303327122200/141juris.pdf.

V. A Tiered Rate Structure Would be Inappropriate for IP CTS

Several providers have advocated for a tiered rate structure for IP CTS. Such proponents point to supposed benefits of a tiered system as justification for adoption. These supposed benefits include 1) a reduced demand on the TRS Fund;[78] 2) disincentivizing over-spending on marketing and sales programs;[79] 3) eliminating the need for a glide path;[80] 4) eliminating the need to account for inflation in the rate setting process;[81] and 5) promoting competition by subsidizing emergent providers.[82] While some of these characteristics may be desirable in a rate structure, claims that they are engendered by a tiered rate structure or are somehow unique to a tiered rate structure are inconsistent with economic reasoning. Indeed, economic reasoning indicates that a tiered rate structure is likely to be inefficient and ineffective. In this section, we review and assess some of the public discussion relating to tiered rates and the TRS Fund as well as ClearCaptions' arguments advocating for its particular tiered rate structure proposal.

A. A Tiered Rate Structure Will not Necessarily Decrease the Burden on the TRS Fund

Proponents of tiers claim that "[a] tiered rate structure has significant benefits including […] materially reducing the demand on the TRS Fund."[83] This claim, however, is incorrect. As a preliminary matter, given the observable data, a volume-based tiered structure is likely inappropriate for the IP CTS market. A tiered structure in which tiers are based on volume presumes that differences in providers' costs are driven by production scale. That is, it presumes there is a strong and strictly decreasing relationship between volume and average cost across all providers. Nevertheless, providers' cost data simply does not support such a presumption. Figure 5 below shows the relationship between provider volume and cost. It is clear that there is very little relationship between reported costs and the volume of minutes a provider provides. This point is also reinforced by Professor Connolly, who correctly points out that "a wide distribution of

---

78 See, *e.g.*, Comments of ClearCaptions, LLC, CG Docket Nos. 13-24 and 03-123, at 4 (filed September 17, 2018) ("ClearCaptions Initial Comments").

79 *Id.*, at 9-10.

80 *Id.*, at 14-15.

81 *Id.*, at 19.

82 *Id.*, at 17-18. See also Reply Comments of Sprint Corporation, CG Docket Nos. 13-24 and 03-123, at 8-9 (filed October 16, 2018).

83 See ClearCaptions Initial Comments, pp. ii, 4.

provider costs and market share can be the result of many factors, not just economies of scale." She goes on to note, "while economies of scale are present in the IP CTS market, a majority of providers are likely to already be producing at levels where they have already exhausted their scale economies."[84]

{{BEGIN HIGHLY CONFIDENTIAL

Figure 5: Projected 2018-19 IP CTS Provider Per-Minute Costs and Total Minutes

END HIGHLY CONFIDENTIAL}}

Moreover, even if a volume-based tiered structure were a theoretically appropriate tool for IP CTS, the practical application of such a structure may result in substantial inefficiency. This is because it is difficult from an external regulatory perspective to choose an appropriate point of transition

[84] "An Economic Analysis of Internet Protocol Captioned Telephone Service Policy Reform," Michelle Connolly, September 17, 2018, Appendix A, ¶ 1, available as attachment to CaptionCall Initial Comments, Appendix C.

between tiers.[85] While individual providers may have this information themselves, they do not necessarily have an incentive to reveal that information. Indeed, the incentive of a provider advocating for tiered rates is to construct tiers in a way that advantages that provider over its competitors. Ultimately, if the transition point does not closely reflect the complex economies of scale for each provider, the system will either fail to support competition or over-subsidize providers.[86]

Additionally, it is misleading to claim that a tiered rate structure will decrease the demand for funding. A tiered rate structure will not necessarily increase or decrease the contemporaneous demand for TRS funds. Indeed, it is the rate *levels* – tiered or otherwise – that will affect the contemporaneous demand for TRS funds. A tiered rate structure, like any other prescriptive rate structure, can engender rate *levels* that affect the average effective reimbursement rate, which will then clearly affect funding requirements – if rate levels result in a higher average reimbursement rate the funding requirement will be higher and if rate levels result in a lower average reimbursement rate, the funding requirement will be lower.

A perhaps more salient consideration than the immediate effect of a tiered rate structure is the dynamic effect such a structure would likely have on funding needs. A tiered rate structure not only tolerates, but in fact promotes and subsidizes inefficiency. Even if the tiers properly reflected complex economies of scale, such a system would subsidize inefficient providers without consideration for their abilities to eventually become efficient. In other words, poorly-operated providers that would have been forced to exit an efficient market would instead remain in the subsidized market. A system that indiscriminately subsidizes small providers effectively circumvents the market forces that would otherwise drive efficiency.[87]

Proponents of a tiered rate structure also claim that such a structure would disincentivize over spending on marketing and sales programs, thereby further reducing the burden on the TRS Fund. However, marketing and sales expenditures are determined by the efficacy of those expenditures with respect to acquiring users and expected lifetime earnings related to those users. Reducing the per-minute earnings reduces the lifetime earnings and thereby the calculus faced by providers when making marketing and sales decisions. This is not a special feature of a tiered rate structure. It is a feature of any structure that reduces expected earnings. Moreover, it is not clear that the reduction of marketing expenditures is an appropriate goal, *prima facie.* Marketing can be consistent with regulatory objectives to the extent that it enables and promotes quality based competition, and broadens market awareness.

Other proponents of tiered rates have claimed that a primary benefit of such a structure is that it promotes competition by subsidizing emergent providers.[88] However, subsidizing providers is

---

85 This is a manifestation of the well-known economic problem of asymmetric information.

86 November 2017 Brattle Whitepaper, pp. 11-12.

87 November 2017 Brattle Whitepaper, pp. 11-12.

88 ClearCaptions Initial Comments, pp. 17-18.

unlikely to result in a reduced burden on the TRS Fund. Indeed, the opposite is likely true. Subsidizing perpetually inefficient providers will increase average costs. Moreover, emergent providers should not need to be subsidized. Other providers have entered the market without subsidization and two new providers are currently applying for certification, all without the promise of tiers or emergent rates. This is because capital markets will support market entry without subsidizing inefficiency, so long as reasonable earnings can be expected and reimbursement rates are stable and predictable.

B. ClearCaptions' Arguments in Support of its Tiered Rate Proposal are Flawed

ClearCaptions advocates for a tiered rate methodology, which it argues will result in savings to the TRS Fund, ensure the financial viability of IP CTS providers, align reimbursements rates to the scale of a provider operating in a given tier, and ensure that providers seek efficiencies as they gain scale.[89] ClearCaptions also argues that a tiered rate system is justified because there are "large differences in the per-minute costs among IP CTS providers that roughly correspond to the vastly different market shares held by each."[90] However, as previously discussed, there does not appear to be a strong relationship between scale and reported costs (see Figure 5 above). Additionally, ClearCaptions' argues that tiers are necessary because smaller providers, including ClearCaptions, operate at a disadvantage compared to larger providers.[91]

While using tiered rates is generally not consistent with economic reasoning,[92] ClearCaptions' specific proposal of tiered rates and related arguments are particularly flawed and lack firm economic basis. ClearCaptions has failed to provide analysis or sound reasoning for its proposed tier transition points. ClearCaptions recently presented arguments that an IP CTS provider would see positive operating margins at a {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} It is unclear, however, for which IP CTS provider these relationships might hold true and how these thresholds {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} ClearCaptions also recently stated that it {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}}, but it provides no discussion as to the connection

---

89 See *id.*, pp. 3-4.

90 *Id.,* at 15-16.

91 See, *e.g.*, ClearCaptions, LLC Ex Parte Filing, CG Docket Nos. 03-123 and 13-24, Attachment 1, at 3-4 (filed June 1, 2018).

92 November 2017 Brattle Whitepaper, pp. 11-12.

93 ClearCaptions, LLC Ex Parte Filing, CG Docket Nos. 13-24 and 03-123, Exhibit 1 at 2 (filed November 7, 2018) ("November 7, 2018 ClearCaptions Ex Parte Notice").

between {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} and its proposed tier transition points.

Further, ClearCaptions' argument that it, as a smaller provider, is disadvantaged by its size is {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}}

Table 4 below shows what IP CTS providers' revenue and profits would be, should the FCC adopt ClearCaptions' tiered rate, and should costs and minutes ultimately reflect those projected in Revised Exhibit 1-3.1. Under its proposal, ClearCaptions would not only continue to have {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} in the 2018-2019 rate-year. While it is likely that reported costs are not a complete accounting of true provision costs, this incomplete accounting is the case for all providers. Hence, even if the profits in Table 4 are overstated due to understated costs, this overstatement does not necessarily change ClearCaptions' position relative to other providers. {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} Despite ClearCaptions' claims that this structure would provide "a sensible profit margin to all players,"[96] only {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} under this proposal. Table 4 shows that this tiered proposal falls short of its goal of {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}}

94 2018 Rolka Loube Annual Report, Revised Exhibit 1-3.1.

95 See, *e.g.*, ClearCaptions Initial Comments, pp. 15-16.

96 November 7, 2018 ClearCaptions Ex Parte Notice, p. 2.

97 November 7, 2018 ClearCaptions Ex Parte Notice, p. 8.

{{BEGIN HIGHLY CONFIDENTIAL

Table 4: IP CTS Provider Profits under ClearCaptions' Proposed Multi-Tier Rate Structure

END HIGHLY CONFIDENTIAL}}

Not only would the rest of the IP CTS industry {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} in the 2018-19 rate-year, but also the proposed rates for each of the tiers {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} See Table 5 below.

{{BEGIN HIGHLY CONFIDENTIAL

Table 5: Comparison of Projected 2018-19 IP CTS Providers' Costs and Proposed Compensation Rates from ClearCaptions' Proposal

END HIGHLY CONFIDENTIAL}}

ClearCaptions ostensibly advocates for this proposal because of the savings that it will bring to the TRS Fund,[98] recently arguing that its tiered model would result in almost $155 million in "savings to the Fund."[99] This argument is flawed. ClearCaptions' discussion of aggregate "savings" to the Fund obscures how those "savings" are realized. While it is true that ClearCaptions' proposal would result in less revenue going to IP CTS providers, these "savings" come at the expense of {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} under the proposed rate.[100] While {{BEGIN HIGHLY CONFIDENTIAL [redacted] END HIGHLY CONFIDENTIAL}} to reduce TRS Fund total compensation, {{BEGIN HIGHLY CONFIDENTIAL [redacted]

98 ClearCaptions Initial Comments, pp. 12-13.

99 November 7, 2018 ClearCaptions Ex Parte Notice, p. 10.

100 See Table 4.

[redacted] END HIGHLY CONFIDENTIAL}}

Further, ClearCaptions' argument for disallowing licensing costs to incentivize research and development ("R&D") and innovation is misguided. [102] Preventing providers from reaping the rewards of past innovations will in no way incentivize future innovation. R&D, innovation, and the ability to monetize intellectual property are dynamically intertwined; it is difficult to have one without the others. In fact, that is the rational for creating intellectual property protections in the first place. Intellectual property is developed through R&D, and R&D is both funded and incentivized through past and future monetization of intellectual property (*e.g.*, through licensing fees). Notably, the iTRS Advisory Council, endorsed by the Fund Administrator, explicitly recognizes the importance of including licensing fees in any accounting of provision costs.[103]

Beyond ClearCaptions' flawed arguments in support of its proposal, it has also made general claims about tiered rates that are incorrect. For example, ClearCaptions claims no glide path would be needed with a tiered rate structure because the tiers act as a glide path. While ClearCaptions' specific reasoning behind this claim is unclear, in general it would be inappropriate to consider a tiered rate structure as a substitute for a glide path. A glide path is meant to mitigate the disruptive effects of a large, otherwise instantaneous drop in revenue. A tiered rate structure may smooth the transition between rate levels as a provider grows, but it does not change the fact that there will be a large drop in rates at the time the rate structure is implemented. In particular, ClearCaptions' proposed tiers rate structure would lead to a 16% instantaneous drop in average provider revenue.[104]

ClearCaptions also claims that because a tiered rate structure is segmented by volume levels and not provider costs, it need not reflect inflation. However, those volume-based levels have reimbursement rates attached to them and those rates must exceed provision costs to maintain a functioning industry. If inflation causes provision costs to exceed reimbursement rates, those rates must be adjusted for that inflation in order for providers to remain viable.

---

101 See Table 4.

102 ClearCaptions Initial Comments, pp. 6-8.

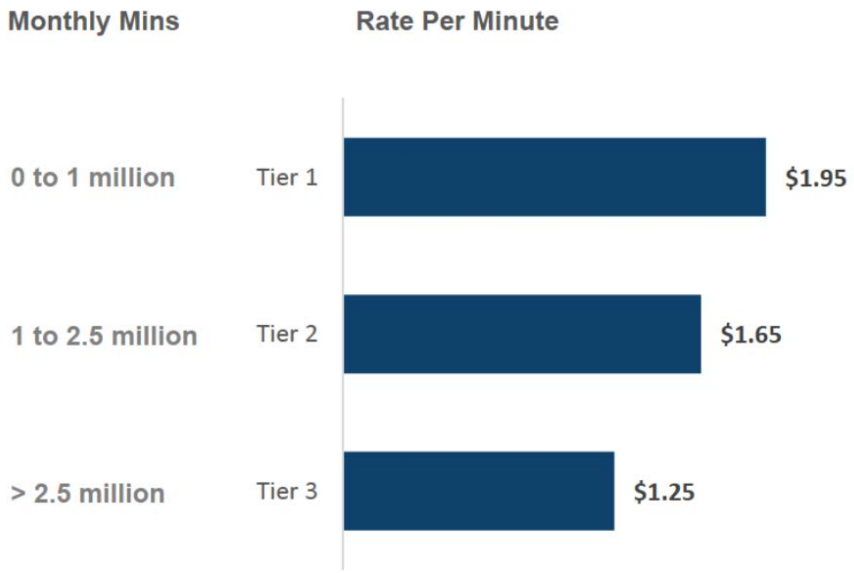
103 Rolka Loube, Ex Parte Comments, CG Docket Nos. 03-123, 13-24, at 4 (filed December 3, 2018), https://ecfsapi.fcc.gov/file/1204051341584/Ex%20Parte%20iTRS%20Council%20Comments%20FCC%2018-79.pdf.

104 Calculated using current interim rate ($1.75) and industry average revenue under ClearCaptions' proposal of $1.47.

C. InnoCaption's Proposed Tiered Rate Structure Would be Advantageous for InnoCaption While Harming Other Providers, Users, and Fund Contributors

InnoCaption recently proposed a tiered rate structure for IP CTS as described in Figure 6 below.[105] The structure and intent of the InnoCaption's proposal is similar to ClearCaptions' proposed tiered rate structures for IP CTS. Moreover, the shortcomings inherent in a tiered structure, as previously discussed in this section, are as applicable to the InnoCaption proposal as they are to ClearCaptions' proposal.

Figure 6: InnoCaption's Proposed Tiered Rate Structure for IP CTS



Source: MezmoCorp (dba InnoCaption) Ex Parte Filing, CG Docket Nos. 03-123 and 13-24, at 8 (filed March 8, 2019).

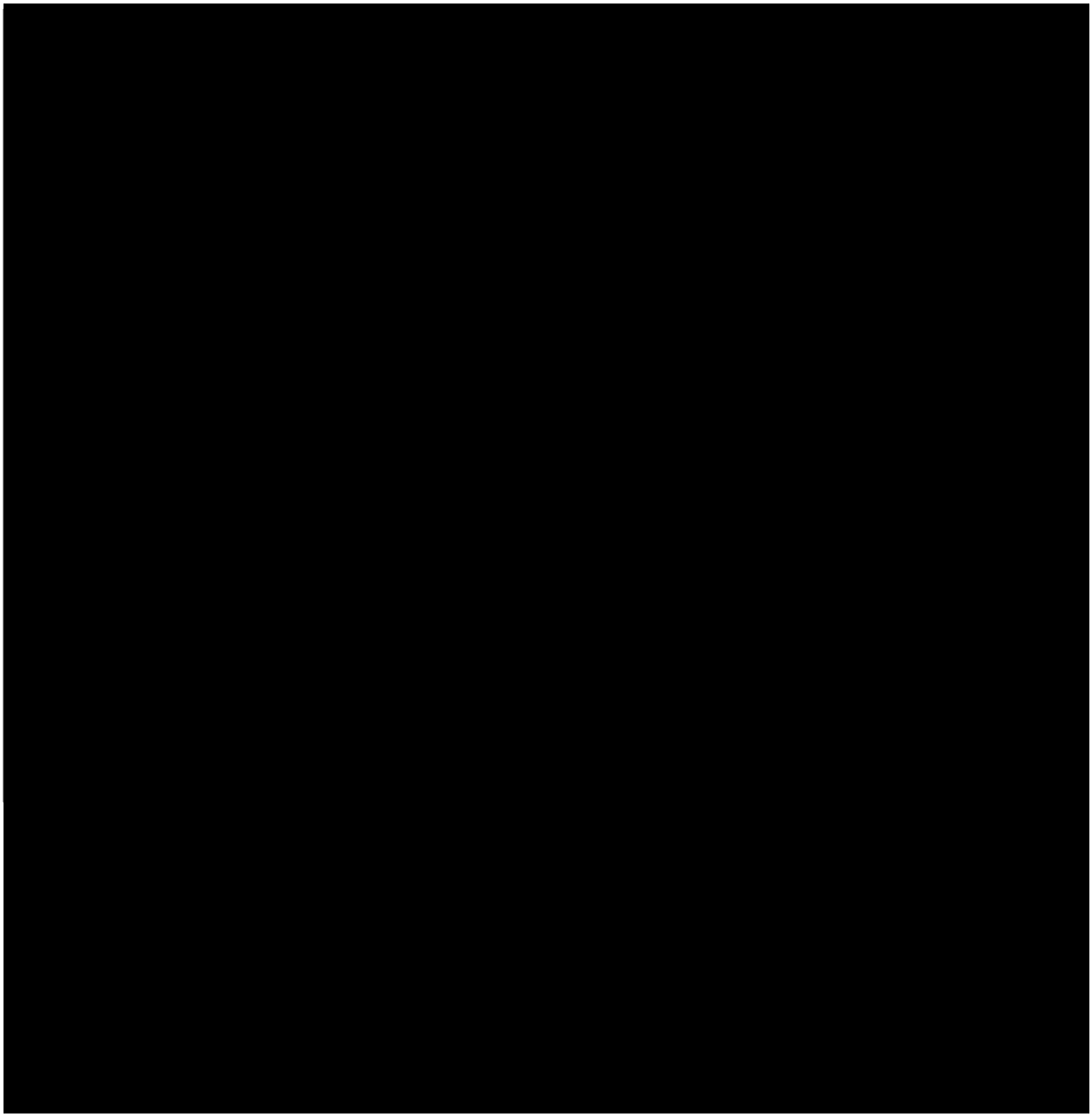
While the InnoCaption's and ClearCaptions' proposed rate structures are conceptually similar, they differ in at least one practical way, which is the speed at which rates decrease relative to a provider's volume. That is, as a provider's monthly volume of minutes increases, the average reimbursement rate per minute decreases much faster under InnoCaption's proposal relative to ClearCaptions' proposal. This is illustrated by Figure 7 below which demonstrates how the average reimbursement rate (on the vertical axis) under each proposal changes as a provider's monthly volume of minutes (on the horizontal axis) increases.

---

[105] MezmoCorp (dba InnoCaption) Ex Parte Filing, CG Docket Nos. 03-123 and 13-24, at 8 (filed March 8, 2019).

{{BEGIN HIGHLY CONFIDENTIAL

Figure 7: InnoCaption's Proposed Rate Compared to ClearCaptions' Proposed Rate



END HIGHLY CONFIDENTIAL}}

To put these rates in context, we denote the average monthly volume of each provider (based on reported volume in the 2017/2018 rate year) with a vertical line. This provides a measure of the average reimbursement rate for each provider under each of the two proposals. Note that the margin of each provider, which can be positive (denoted in green) or negative (denoted in red) is the vertical distance between the average reimbursement rate of a provider and the per minute cost of a provider. It is instructive to note that under the InnoCaption's proposal, **{{BEGIN HIGHLY CONFIDENTIAL** [redacted] **END HIGHLY CONFIDENTIAL}}** while under the ClearCaptions' proposal, **{{BEGIN HIGHLY CONFIDENTIAL** [redacted] **END HIGHLY CONFIDENTIAL}}** Hence, each proposal appears to be constructed **{{BEGIN HIGHLY CONFIDENTIAL** [redacted] **END HIGHLY CONFIDENTIAL}}**

Ultimately, InnoCaption's proposed rate structure would **{{BEGIN HIGHLY CONFIDENTIAL** [redacted] **END HIGHLY CONFIDENTIAL}}**

VI. Shortcomings of CaptionCall's Proposed Auction Methodology

CaptionCall has proposed a reverse auction method for determining reimbursement rates. The auction would in essence sell the right to acquire new customers and be reimbursed for the usage of those customers from the TRS fund. A significant shortcoming of this approach is that the volume sold by providers is not determined in the auction. Nonetheless, a provider's willingness to accept a rate and hence its bidding decisions are linked to the volume the provider expects to provide.[106] The FCC and economic experts in the VRS proceeding have correctly recognized that decoupling rates from volume in an auction setting will likely lead to a reimbursement rate "that is either well above the average cost of providing service, or so low as to keep currently higher cost providers from continuing or new entrants from joining the market."[107]

Moreover, the specific auction structure proposed by CaptionCall coupled with ASR as a potentially disruptive emerging technology also presents a substantial challenge. Several potential market entrants have applied for certification to provide ASR-only service. If the provision cost of that service is substantially lower than costs associated with CA-assisted calls, then there is realistic potential for the auction to be won by ASR-only providers. This would make CA-assisted calls economically untenable, effectively ending such service. However, it remains to be shown that ASR-only service can meet the functional equivalence mandate. Moreover, ASR is not appropriate for all IP CTS calls. Nonetheless, there will be no alternative for such calls if the auction methodology effectively eliminates CA-assisted service.

Additionally, an auction that reduces the number of competitors, such as that proposed by CaptionCall, sets current efficiency in opposition to long-run efficiency. That is, getting the lowest possible rate now risks creating an anticompetitive market in the (near) future, which will drive future rates up. This is because CaptionCall's proposal will effectively prevent some providers from being reimbursed. Providers are critically dependent on new users. Hence, the inability to acquire new users will effectively put a provider out of business. This will lead to market consolidation, which will dampen competition on several fronts. Providers will have less pressure to bid low in subsequent auctions, and there will be less quality based competition for users.

---

106 While, as previously discussed, there appears to be little linking costs to volumes across different providers, there will still likely be some relationship between costs and volume within individual providers over time.

107 *Structure and Practices of the Video Relay Service Program, Telecommunications Relay Services and Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities,* Report and Order, 32 FCC Rcd 5891, ¶ 46 and n.133 (2017).

VII. Conclusion

Although MARS, or some variation of MARS, is likely the most economically efficient rate methodology for IP CTS, continuing with or revising the MARS methodology appears to be outside the Commission's current consideration. Of the remaining alternative rate methodologies, price cap is the most likely to be consistent with the Commission's mandate with respect to IP CTS for the reasons discussed in Section II. Relatedly, it is also the most likely to achieve long run cost efficiency in the IP CTS market.

For the reasons discussed in Section IV, cost-based rate methodologies result in provider incentives that are inconsistent with Commission's goal of minimizing the burden on the TRS Fund while still providing a functionally equivalent service. This is because cost-based rates incentivize providers to maximize provision costs in order to maximize their earnings, which are a flat percentage of costs.

Similarly, for the reasons discussed in Section VI, the auction method proposed by CaptionCall is likely inappropriate for the IP CTS market. Nevertheless, even if that were not the case, such a proposal is not a near term solution, as an enormous amount of time and planning would be required to safely implement any auction methodology.

Additionally, it would be inappropriate to impose a tiered structure. This is because such a structure is likely an ineffective approach for lowering costs in the long term, inefficient from a practical regulatory standpoint, and not necessary to spur market entry or competition. Moreover, it should be noted that several providers have recently entered the market and two additional providers are currently applying for certification, all without the promise of a tiered structure or an emergent provider rate.

BOSTON
NEW YORK
SAN FRANCISCO

WASHINGTON
TORONTO
LONDON

MADRID
ROME
SYDNEY

THE Brattle GROUP