

Price Cap Regulation and Cross Subsidization

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Introduction: Cross-subsidization is the support of one service by other services. Throughout the history of telephony there have been many claims that cross-subsidies are used to support universal service or suppress competition. Local Exchange Carriers (LECs) currently face the threat of loss of access markets to alternative access providers (ALTS).² The transport market is the first market that the ALTs enter. Clearly, the LECs have an incentive to cross-subsidize their transport access service in order to diminish or demolish this threat to their long term dominance of the industry. The purpose of this paper is to investigate if, under the regime of price cap regulation, LECs have the ability to cross-subsidize the transport market.

It is claimed that price cap regulation, because it allegedly eliminates the incentive to shift costs among services, reduces the possibility of cross subsidization. The FCC has also determined "that the adoption of price cap regulation for the LECs constitutes an effective complement to cost allocation, reporting and enforcement safeguards, to reduce BOC incentives to cross-subsidize."³

This paper will examine (1) whether the theoretical arguments in favor of price cap regulation for the purpose of limiting cross-subsidization are reasonable; (2) whether price cap regulation as it has been established by the FCC can eliminate cross-subsidization in practice; and (3) is price cap regulation useful once alternative firms are allowed to enter selective markets.

Price Caps and the Incentive to Cross-Subsidize: Under price cap regulation, individual service prices are no longer tied to cost of service studies. Instead, prices are allowed to rise with

¹ The views expressed in this paper are those of the author and do not necessarily represent the views of the Public Service Commission of the District of Columbia or its Staff.

² The term, ALTS, refers to alternative access providers. The term, CAPS refers to competitive access providers. The term, ALTS, is preferred to the term, CAPS, because it is not clear when or if the alternative providers will become effective competitors.

³ Computer III Remand Proceedings: Bell Operating Company Safeguards and Tier I Local Exchange Company Safeguards, Report and Order, CC Docket No. 90-623, released December 20, 1991, para. 13.

inflation and decline due to productivity offsets. Specific allowances are also made for extraordinary items that can affect utilities in a manner different from the rest of the economy. These items are referred to as exogenous factors.

The separation of price from cost eliminates the need to develop elaborate cost studies for rate making purposes. It is argued the utility no longer needs to artificially increase costs to support a desired price increase, and no longer needs to artificially reduce costs to support a desired price decrease. Under price cap regulation, a utility's request to increase a price because the cost study shows that price is below cost is irrelevant.

However, this separation does not eliminate the incentive to selectively alter prices. The desire to alter prices is a function of the desire to capture monopoly rents and to combat alternative providers. For example, in a market where demand is relatively price inelastic, the utility often desires to increase prices. To justify the higher price, the utility would shift costs to that service. Regulators who desire to set price according to cost would allow the price to rise. Of course, before authorizing the higher price, the regulator would examine the cost study to verify if it accurately represented the cost of service. In order to ensure that the regulator concludes that the study is accurate, the utility has the incentive to prepare elaborate studies to build an aura of authenticity around the resulting cost. What is important to remember is that the purpose of the elaborate cost study is not to win an intellectual debate similar to the debate over how many angels can dance on a pin head. Instead, the purpose of the cost study is to support a pricing strategy.

If price cap regulation allows for selective price changes then price caps will also allow utilities to develop cross-subsidizing pricing strategies. Moreover, without a cost study to use as a yardstick for reasonableness, the regulator has a more difficult task of determining if a cross-subsidy exists.

Price cap regulation allows for selective price change under two scenarios. First, if prices for services are not compelled to match the cap, then the utility has the incentive to set the price of service A at the cap and the price for service B below the cap. If the cap is above the cost of service, the utility would be able to earn monopoly rents in the market for service A which can be used to subsidize service B. In order for this scenario to be realized, the utility must have monopoly power in market A, and the price cap mechanism must allow price to exceed service cost.

In the second scenario, the price cap is applied to an average price of a group of services. If there is a large number of services within the group and the price of any individual service is not kept from fluctuating, it would be possible for one of the services within the group to subsidize another service in the group even if the average price for the group is reasonable. Therefore,

price cap regulation does not alter the ability to cross-subsidize. It simply changes the mechanism through which the subsidization is accomplished.

Cross-Subsidization: Scenario 1: The two basic assumptions that must be true for cross-subsidization to occur are: (1) the utility must have monopoly power in one market, and (2) the price cap must exceed service cost. This paper will not address the amount of monopoly power still retained by telephone utilities. It will be assumed that such power exists in a significant number of high revenue markets. If that power is not restrained by regulation, the utility could raise rates to generate excessive revenues.

This paper will also examine how the price cap mechanism can depart from the cost of service. This possibility will be shown by comparing the price cap mechanism to market prices, productivity trends, and input price trends.

Market prices can measure the departure of the price cap mechanism from cost of service where competitive markets exist. In such instances, the market price should follow the cost of service.

A market price that is below the price cap's maximum price represents a situation where the cap does not reflect the cost of service.

A recent example of the departure of the market price from the price cap mechanism occurred under the guideposts established by the Natural Gas Policy Act. This Act allowed the price of regulated gas to rise in accordance with an inflation factor and real cost factor. The Act separated natural gas by vintage, location and depth. A price cap mechanism was determined for each type of gas. The most common mechanism used was to set the price at \$1.75 on April 20, 1977 and allow the price increase by the change in the Gross National Product price deflator plus 0.2 percentage points.⁴

The history of the price cap mechanism and average well head prices is depicted in Chart 1. The Chart shows the price cap maximum price starting at \$1.75 and rising due to increases in the GNP deflator. The price of regulated gas rises following the cap until 1983. Then the price falls dramatically. The price of all gas, regulated and deregulated, rises until 1983 and falls faster than the price of regulated gas. If the price cap mechanism had been enforced through 1990, and the gas companies could have maintained the price at the cap, then the 1990 price would have

⁴ A summary of the price cap mechanisms is provided in Charles F. Phillips, Jr., The Regulation of Public Utilities, Public Utilities Reports, Inc., Arlington Va., 1984, pages 588-9.

been \$3.52 instead of \$1.71 per MCF.⁵ This example shows how a mechanical price cap mechanism can easily diverge from market realities. Moreover, if the gas companies had been operating in two markets, and could have sustained the price cap maximum in one market, it is clear that the gas companies could have easily subsidized the second market.

To determine if the price cap mechanism used to regulate telephone markets track telephone costs, it is necessary to examine those formulas and compare the variables in the formulas to telephone costs. The FCC price cap formulas allow prices to increase according to changes in the fixed weighted GNP deflator and to decrease according to a productivity offset. The productivity offset, in theory, measures the difference between the productivity of the telephone industry and the productivity of all industries in the United States.

The formulaic derivation of this relationship begins with the following three equations:⁶

$$1) \quad \Delta P_o^t = \Delta P_i^t - \Delta TFP^t$$

$$2) \quad \Delta P_o^{US} = \Delta P_i^{US} - \Delta TFP^{US}$$

$$3) \quad \Delta P_o^{US} = \Delta GNP_{PDF}$$

where: P_i = input prices, P_o = output prices, TFP = total factor productivity, GNP_{PDF} = the GNP deflator, t indicates the telephone industry, and us indicates the US economy.

By subtracting equation 2 from equation 1, substituting the GNP deflator for US output prices and rearranging, the following equation is derived.

$$4) \quad \Delta P_o^t = \Delta GNP_{PDF} + [\Delta P_i^t - \Delta P_i^{US}] - [\Delta TFP^t - \Delta TFP^{US}].$$

By assuming that the changes in telephone industry input prices equal the changes in US input prices, equation 4 is transformed into the price cap equation:

$$5) \quad \text{price cap} = \text{GNP deflator} - \text{the productivity offset}.$$

⁵ Table 24. Projected Volumes and Prices of Wellhead Purchases by NGPA Category, Natural Gas Monthly, Energy Information Administration, U.S. Department of Energy, Washington D.C., Selected Issues.

⁶ This formal presentation was first suggested by William Taylor. See William Taylor, "Productivity Measurements in the Price Cap Docket," Opposition of the United States Telephone Association to Petitions for Reconsideration, CC Docket 87-313, Attachment A, filed December 21, 1990.

Several observations can be made from these transformations. First, the reasonableness of the price cap formula is dependent on the understanding that the formula includes one factor that represents cost increases and another factor that represents expected cost decrease. That understanding is wrong. The factor that represents cost increases, the GNP deflator, is really an output price measure, not a measure of input costs. However, since the GNP deflator has been interpreted as a measure of cost, it is useful to compare it to telephone industry cost changes.

Second, the realism of the price cap formula depends on the assumption that changes in the input prices of the telephone industry match changes in input prices for the entire economy. A measure of US input price change is the difference between changes in the GNP deflator and the total factor productivity. Thus, it is necessary to compare changes in telephone industry input prices to changes in the difference between the changes in the GNP Deflator and the total factor productivity.

The best available measure of telephone industry input prices are the New York Telephone Company's Telephone Plant Indices. These indices are developed for different plant purchases such as fiber cable and digital switches, and labor prices. The individual indices are combined to form a composite total company Telephone Plant Index. In Chart 2, the total company index is compared to the GNP Deflator, and the GNP Deflator - TFP. This comparison shows that telephone industry's input price changes are less than the changes in the other variables for every year under observation.

If the transformation of equation 4 into equation 5 had used the correct assumption, that telephone industry price changes are less than US input price changes, then the allowed price changes under a price cap regime would be reduced. This result indicates that the price cap mechanism contains a bias towards excessive price increases. Therefore, the conditions for cross-subsidization under price caps have been incorporated into the FCC approved price cap formula.

The other piece of the price cap formula is the productivity offset. The FCC uses either a 3.3% or 4.3% offset, depending on LEC commitment to particular price changes.⁷ This range is based on judgment and consideration of various conflicting estimates of the productivity offset. For example, the Bell Companies asserted that their average offset is 0.74%. The range across companies

⁷ In the Matter of Policy and Rules Concerning Rates for Dominant Carriers, CC Docket 87-313, Second Report and Order, Released October 4, 1990, at 125-26.

starts from a low of -2.61% to a high of 6.59%.⁸ A negative offset indicates that the companies experienced a lower productivity growth rate than the entire nation. AT&T asserted that the LEC productivity offset should be 7.1% or 9.9%.⁹ Other parties examined these estimates and found numerous errors and biases. Many of these problems result from the methods used to measure productivity. These results indicate that there is a pressing need for the FCC to collect and compile information that would allow for more accurate measures of telephone industry productivity.

Cross-Subsidization: Scenario 2:

Price cap mechanisms can allow cross-subsidization within baskets of services. A price cap basket is a group of services subject to the same price cap formula. The subsidy can take place within a basket when the price of one good increases and the price of another good decreases, even though the set of prices for the entire basket remains in compliance with the price formula.

Under the FCC LEC price cap rules, the service baskets are: (1) common line, (2) traffic sensitive, (3) special access, and (4) interexchange. The traffic sensitive basket includes: local switching, equal access, information, and transport.¹⁰ In an effort to prevent service cross-subsidy within a basket, the FCC established an elaborate set of rules that limit annual rate changes for individual services. The most important aspect of this rule is the limitation of service band indices annual price to 5% plus and minus the change in service basket price cap index.¹¹

The first step in determining the effectiveness of the FCC rules to prevent cross-subsidies is to examine the current price indices for the RBOCs. Chart 3 compares the service band indices for local switching and local transport for Bell Atlantic, Bell South, and Pacific Bell. In each instance, the index for local switching is at the upper limit, while the index for local transport is at the lower limit. Also note that the band limits for switching are higher than the band limits for transport. This difference cannot be explained by differences in productivity, inflation or exogenous factors because transport and switching

⁸ In the Matter of Policy and Rules Concerning Rates for Dominant Carriers, CC Docket 87-313, Report and Order and Second Further Notice of Proposed Rulemaking, Released April 17, 1989, at 702.

⁹ Id., at 672.

¹⁰ CC Docket No. 87-313, Second Report and Order, Appendix B at 3.

¹¹ 47 CFR 61.47.

services are in the same basket. Instead, the differences are the result of the cumulative nature of the pricing strategy. That is, if the price is set at the low end of the service price band in year one, then service price bands in year two will be lower than the bands associated with a price set at the upper end of the service band in year one. Over time this effect will allow the prices in the two markets to steadily diverge. Therefore, the FCC rules for preventing of cross-subsidization did not prevent the RBOCS from instituting a cross-subsidizing pricing strategy. The strategy lowered price in the transport market, the market that alternative providers are entering. Without additional information pertaining to the cost of service, it not possible to determine if a cross-subsidy is occurring. However, compliance with the FCC rules does not appear to prevent cross-subsidization.

Price Caps and the Entry of Alternative Providers: The entry of alternative providers has caused many industry participants to question the viability of price cap regulation. The National of Regulatory Utility Commissioners' (NARUC) Committee on Communications established an Access Issues Working Group (AWIG) to investigate current problems with the Part 69 rules. A common complaint with the current prices is that they are too high. Major users do not want to pay the high price. LECs realize that the high price is an incentive for users to shift to alternative providers.

The reasons given for the high price are that (1) the price caps started from inappropriate prices established under the Part 69 rules; (2) the prices reflect obsolete technologies; (3) the prices are averaged across a study area; and (4) the price cap rules do not allow for major shifts in prices. Each of these problems will be discussed below.

First, it is asserted that the Part 69 rules allocate excessive amounts of revenue requirement to transport services and away from common line service. The primary causes of this misallocation are the rules associated with general support facilities and central office equipment expenses. If these rules were changed, it would be possible to significantly reduce transport rates.¹² These reductions would benefit the LECs and discourage entry.

Second, the current prices allow the LECs an opportunity to recover the investments in obsolete technologies. However, if the entrants only have the newer technologies which are cheaper on a per unit basis, a competitive market will not allow the LECs to recover the costs of the old technology, regardless of the regulatory intent. Therefore, if effective competition arrives in the transport market, LECs must either write-off the investment in the obsolete technologies, or recover their costs in alternative

¹² Southwestern Bell Telephone Company, CC Docket No. 91-213, Ex-Parte: Analysis of the Residual Interconnect Charge.

markets. Currently, there is no method for either writing-off the investment or transferring their costs to other markets.

Third, prices are currently averaged across a LEC study area. However, if costs are sensitive to customer density, and customer density is not even across a study area, then there will be subdivisions of the study area with lower than average costs and other subdivisions with higher than average costs. An entrant that does not have the responsibility to provide ubiquitous service in the study area will opt to serve only the low cost area. The entrant can attract customers as long as his rate is beneath the LEC study area wide rate. The situation could occur where the entrant has higher costs but lower rates than the LEC in the more dense subdivision of the study area. In this case, entry would be inefficient, but profitable.

Fourth, price caps restrict the annual change in prices to remain within the limits set by the service band indexes. While these restriction, as noted above, do not prevent LECs from adopting a gradual cross-subsidizing pricing strategy, they do prevent massive changes in the price. The only way to achieve a massive price change is through the exogenous factor. However, realignments in prices caused by exogenous factor changes are time consuming and the results are unpredictable.

This review of the problems of price cap regulation in light of the entry of alternative providers should not be interpreted as an endorsement of any alternatives presented by participants in the AWIG process. Instead, the review stresses the failure of price cap regulation to meet the challenge of current events.

Price Caps and Efficiency: One of the main reasons for turning to price cap regulation is the desire to provide LECs with the incentive to provide services in a more efficient manner. It is believed that because LECs could pass through all of their expenses under rate of return regulation, LECs would purchase excessive resources. Under price cap regulation, LECs cannot automatically pass through expense increases, and thereby, have an incentive to purchase in a relatively more efficient manner.¹³

Recent RBOC employment policies suggest that telephone companies are responding to a host of different incentives that are not captured by the simple logic of the price cap mechanism. The RBOCs, under rate of return regulation, have instituted massive reductions in force. Chart 4 shows that between 1984 and 1990 the RBOCs reduced their workforce by 111,003 workers, representing 20% of the 1984 workforce. However, if a company knows that price cap regulation is to be adopted in the near future, then its profit maximizing strategy would be to retain the workers until regulation switched from rate of return to price cap regulation, and then

¹³ CC Docket No. 87-313, Report and Order, at 14.

reduce its workforce. This review of labor policy does not prove that price cap regulation is superior or inferior to rate of return regulation. The RBOC efficiency effort could have been the result of a multitude of other factors. However, these events shows that rate of return regulation, in practice, has not prevented the RBOCs from achieving their efficiency goals.

Price Caps and Consumer Benefits: Price cap regulation, because it provides incentives for firms to become more efficient should lead to consumer benefits. One measure of consumer benefits is price reduction. Chart 5 shows the percentage change in prices for interstate and state toll services as measured by changes in the Consumer Price Index (CPI). Following divestiture, interstate toll rates decreased in every year from 1984 through 1990, the years associated with rate of return regulation. Rates increased in 1991 and the first half of 1992, the years associated with price cap regulation.

Conclusions: It is alleged that price cap regulation would prevent cross-subsidization. This paper has shown that cross-subsidization can occur under price cap regulation as long the telephone company retains monopoly power in at least one market. If that conditions is true, then the telephone company can engage in a pricing strategy that will lead to cross-subsidization within a price cap regime.

In addition, it is alleged that price cap regulation would provide incentives for telephone companies to become more efficient, and share the efficiency gains with consumers. The post divestiture history appears to conflict with these assertions. Telephone companies significantly reduced their work forces prior to the adoption of price cap regulation, and long distance rates have increased since the adoption of price cap regulation. Finally, the long term viability of price caps has been challenged due to price caps' inability to provide a framework that addresses the question of entry in era of technological change.

Chart 1: Natural Gas Price Caps

NGPA Guidelines

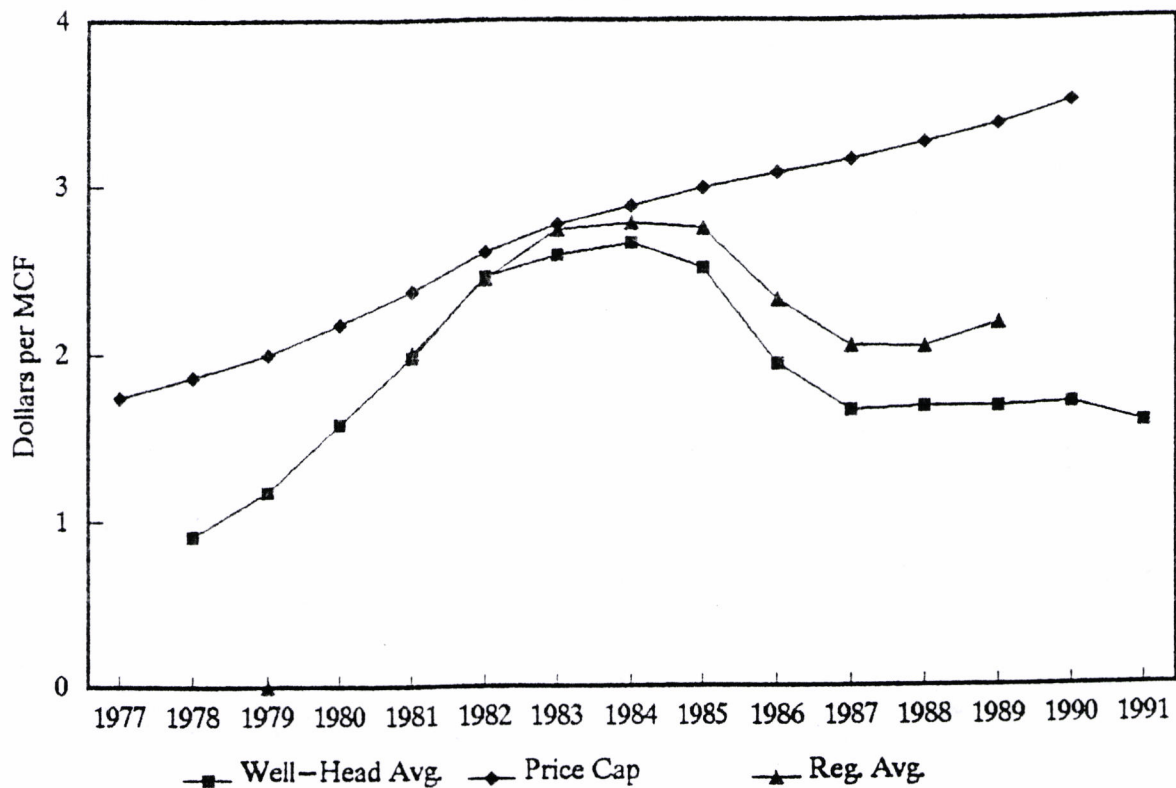


Chart 2: Inflation Rates

Company vs. National Indexes

