

**Price Cap Policies in the Transition
from Monopoly to Competitive Markets**

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Abstract

Price cap regulation is replacing traditional rate of return regulation in a number of jurisdictions. This development can be viewed as a regulatory mechanism facilitating the transition from monopoly to competitive markets. However, multiple goals cannot be achieved via a single instrument. Pure price caps have been modified to better meet the mix of regulatory objectives. These modifications further constrain incumbent telcos.

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Price cap regulation represents a possible regulatory mechanism for bridging the transition from monopoly to competitive markets. However, multiple goals cannot be achieved via a single instrument. Pure price caps have been modified to better address a range of regulatory objectives. The experiences of British Telecom (BT) and AT&T under price cap regulation, since 1984 and 1989, respectively, are used to illustrate the evolution of this regulatory strategy.¹ This paper concludes with some observations regarding price cap implementation.

1. Price Cap Policies and Regulatory Objectives

The basic rationale for abandoning rate of return regulation (ROR) in favor of incentive regulation is twofold: to provide more powerful incentives for cost containment and to facilitate the transition to competitive markets. The advantages of moving from cost-based to price-based regulation seemed clear in principle. Theory suggested a number of performance improvements that were obtainable from a change in regulatory regime. Braeutigam and Panzar (1989) concluded that price cap regulation

" . . . can induce the firm to minimize costs, produce efficiently in noncore markets, undertake cost-reducing innovation as an unregulated firm would, and diversify into a noncore market if and only if diversification is efficient. Incentives to misreport cost allocations and choose an inefficient technology simply disappear, since cost allocation is not required under this regulatory scheme."

Of course, even as the theory was being fleshed out, we were beginning to observe the actual design of plans and their implementation in practice.

As experience accumulates, we ought to be able to draw conclusions about the shift to price caps and other forms of incentive regulation. For example, are government administrative costs

¹See Beesley and Littlechild (1989) regarding the British experience; and see the US FCC (1993) for a recent performance review of the AT&T plan. BellSouth Telecommunications (1993) reports that RI, CA, MI, ND, NJ, OR, (Rochester) NY, and WV have forms of effective price regulation plans, and AR, AZ, DE, IL, IN, OH, PA, VT, and WI have proposed plans.

reduced under new regulatory regimes? Is undue rate discrimination avoided by price caps? Has greater production, allocative, and innovative efficiency been fostered? These questions represent a subset of those associated with Bonbright's (1961) listing of eight rate-making objectives. So we turn to those fundamental regulatory goals and consider how price caps have fared in terms of each objective.

Simplicity and Public Acceptability

The simplicity of price caps seemed to promise real resource savings--both to regulators and firms. Advocates argued that regulation with a "light hand" would utilize competitive pressures where possible, while protecting customers who faced few supply options. A formula offered the possibility of reducing regulatory debates to a few key parameters: plan duration and adjustments for changes in input prices, technology, and key developments outside the firm's control, such as a change in tax rates or depreciation policy. In addition, Kwoka (1993) pointed out that the design of price caps required that attention be given to baskets, bands, floors, and ceilings. In some regulatory applications, simplicity has been sacrificed for the achievement of greater public acceptance. These features of price cap plans have emerged to increase the comfort level of key stakeholders--but they add more points for debate and bickering. It is doubtful that substantial administrative savings have been realized, partly because conditions of interconnection remain such a thorny issue.

Freedom from Controversy

All the terms of the price cap are controversial. The cost of capital was the lightning rod under rate of return regulation. Customers and the firm played a zero-sum game. More for one party meant less for the other. The degree of success for ROR in promoting cost containment is open to question, but additional regulatory instruments complicate comparisons between ROR and

price cap regulation.² Any form of regulation is likely to involve additional instruments as behavioral abuses are identified or concerns regarding performance are made manifest.

The complexity of ROR regulation, with attendant cost allocations and highly choreographed hearings, has parallels in price cap regulation. Numerous issues need to be resolved besides the duration of the cap. For example, how is service quality to be addressed? Similarly, what if "excessive" returns are realized? The regulator's score on the newspaper headline test will depend on perceptions regarding the "deal" and the associated values of formula components.

Thus, the FCC price cap plan for RBOC access charges to AT&T, MCI, Sprint, and other interexchange carriers effective in 1991 utilized a sharing mechanism. This plan overlaid the price cap with an earnings sharing plan so that the IXCs would receive some of the benefits of productivity advances exceeding the 3.3% offset. Kwoka (1993, p. 741) argued that since the productivity growth ranged from -2.6 to +6.6 percent per year, there was a great deal of uncertainty about opportunities for cost reductions across companies and geographic areas. To avoid excessive returns on interstate access, the FCC viewed it necessary to place a cap on realized returns on investment. Of course, there are still arbitrary cost allocations in determining investment serving interstate calls.

In settings where the firm has superior information about its technological capabilities, there are generally gains to affording firms a choice from a carefully designed menu of possible regulatory alternatives. To improve incentives for cost reduction, the LECs were also given a choice between

²Doug Jones (1992, p. 127) has provided a catalogue of institutional features which discouraged inefficient behavior, ". . . disallowance of imprudently incurred expenses, prudence reviews and application of the used-and-useful test, yardstick performance comparisons, not only with public power but among similarly situated investor-owned utilities, commission-ordered management audits of both the reconnaissance and focused type, judicious employment of regulatory lag, altering the allowed rate of return to induce appropriate utility behavior, [and] occasional and selective jawboning by regulators."

sharing plans--both of which set 11.25% as a reasonable return.³ One involved a 3.3% productivity offset, with 50/50 sharing between 12.26 and 16.25% return on investment, where the latter represented a maximum allowed return. The second option involved a 4.3% productivity offset, with 50/50 sharing from 13.26 to a higher cap of 17.25% ROI. All seven RBOCs selected the lower productivity offset and lower potential returns, perhaps because their planned additions to capacity and modernization programs were going to keep return on investment lower over this period.

Another factor complicating the picture is the role of recent entrants and potential suppliers in the regulatory arena. Since these are key participants in the transition to more competitive markets, regulators must address their concerns in the context of the cap. Trade-offs exist between the rate of entry and revenue sufficiency for incumbent firms.

Revenue Sufficiency

The financial viability objective remains unchanged, but competition places new pressures on the partially regulated firm. To some extent, regulatory control over entry conditions strongly influences the incumbent's ability to maintain revenue sufficiency. Dennis Weisman (1994) has shown that considering price caps in the absence of other regulatory policies is problematic. He concludes that incumbents may not adequately understand, or at least appreciate, the complementary role of entry policy: "There is a tendency for the firm to confuse the regulator's commitment not to lower the price cap with the regulator's commitment not to lower market price."(p. 350) This observation regarding regulatory control of entry conditions suggests that once the price cap "deal" has been

³Sappington (1994, p.p. 258-261) ably summarizes the rationale behind the "revelation principle" and the use of a menu of incentive plan options. "When residual uncertainty exists for the firm, targets, rather than exact performance levels, can be specified, along with reward schedules for deviations from the selected target. Generally, low performance targets are optimally coupled with low rewards, and very modest compensation for exceeding the low target....The key is to make it unattractive for the firm to implicitly understate its capabilities by selecting a very modest performance target and subsequently earn large rewards for exceeding the target." (p. 261)

struck, regulators have little vested interest in the financial performance of the incumbent. They may attend more to the pleas of entrants once core customers are protected from rapid increases in prices.

Are firms being irrational when they press for price caps without sharing rules? One explanation for the preference for no sharing might be that the strategic plans of RBOCs call for substantial network modernization in order to be positioned to combat future competitive threats and facilitate their entry into video and long distance. Thus, they will not be in a position to "share" much anyway in the near term. Over the long term, the no sharing rule may be preferred since regulatory policy could be perceived as less important a determinant of incumbent success than in the past.

Revenue Stability

The revenue stability objective applies to net revenue rather than gross revenue. Dramatic fluctuations in net revenues would cause high variability in the realized rate of return. Developing an alternative way to support universal service would create an important instrument for this objective. But this is not addressed directly by price caps. To the extent that arrangements accompanying caps enable incumbents greater freedom to enter new markets, the new revenue sources may promote this objective of revenue stability--while keeping basic residential rates down.

Price Stability

The number and composition of baskets constrain prices. Thus, stability of a price index is promoted. In addition, further constraints are often introduced, such as a 5% up or down movement per year, establishing floors or ceilings that promote short run price stability for particular services. The cumulative effect over several years can be substantial, however. Blase and Harris (1994) point out that Local Exchange Carrier (LEC) access revenues are \$564 million below what the index would allow for 1991-1993, suggesting that competitive pressures from competitive access providers (CAPs) and cable systems are holding down interexchange carrier (IXC) access rates.

Fairness in Apportionment of Total Costs

Standards for fairness have always been troublesome. Inputs shared by several services could be paid for by a variety of allocation schemes--all of them arbitrary. One could argue that while historical telecommunications cost allocations served politically useful purposes, the advent of new technologies and new entrants exposes incumbent LECs to serious threats. Urban-rural rate averaging is not likely to be sustainable, nor are current levels of access payments from IXCs. Hence, price caps have as one advantage the elimination of regulation-driven cost allocation schemes. However, the basic problem of sharing the savings from jointly-used resources does not disappear.

To some extent, the initial conditions for the cap will be part of a political compromise that compromises the mix of baskets and side-constraints. Since price caps are adopted partly because we better appreciate how costs are dependent on the regulatory regime itself, to what extent should future cost reductions be flowed back to consumers? Those exogenous reductions that would have occurred regardless of the regulatory regime get captured by consumers via an "X" adjustment. For example, the "X" for the LEC access charge is 3.3%, while the "X" for BT increased from 3% in 1984 to 7.5% today. Determining the appropriate productivity offset is just one of the tasks facing regulators who would move towards price caps.

It is interesting to note that Brian Carsberg, the first Director General of OFTEL, stated in his 1985 Annual Report that fairness was not in his domain, "I do not believe, for example that I could properly put forward a proposal for a rule that all people on low incomes should be given telephones free of rentals; such a proposal would involve arbitrary judgements about matters of income redistribution and my making it would involve the usurping of the proper role of Government, exercised through the Department of Health and Social Security." (para 1.12) However, in 1989 he prodded BT to implement a low user program to promote affordable rates to low income subscribers.

Avoidance of Undue Rate Discrimination

Side constraints such as floors and ceilings on annual price movements address the issue of undue rate discrimination in the near term. The evolution of the BT constraint provides an example of how price cap regulation has evolved over an extended period. Since the UK experience heavily influenced subsequent adaptations in the US, it is instructive to consider how the design of the price cap mechanism has changed over time. Burns (1993) describes three developments in the UK regime. First, the X-factor has increased over time. This tightening of the constraint has been viewed by many as an approximation of rate of return regulation: the slow emergence of rivalry in a number of markets implies that BT would have earned excessive returns without modification of the offset.

Furthermore, other constraints have been added to the plan over time. Initially, the maximum residential exchange line rental was constrained to RPI+2; the constraint remains the same through 1997. Furthermore, additional constraints have been added to the plan -- limiting increases in connection and installation charges, private circuits, and other items. In 1989, a low usage plan was mandated, with the usage level doubling in 1993. In the 1991 plan, the median residential bill was constrained to increase at the rate of the RPI (Retail Price Index).

Individual caps are excellent for maintaining the status quo, and the prices of some services may still fall. When services are capped individually, however, the firm is limited in its ability to undo cross-subsidies over time. In essence, the firm is over-constrained; this is one justification for price-cap regulation of baskets. Rate bands and side constraints accentuate the problem by limiting the firm's price changes each year.

In addition to side-constraints, additional services were brought into the basket. Only 48% of BT's revenue was under price caps in 1984, but 71% was capped by 1993, including operator assisted calls and international calls. Burns (1993) maintains that the additions were because vigorous competition had not occurred in these markets, so the regulator wanted to limit the exercise of

market power. In addition, core residential customers have been given special attention, with a low use scheme adopted as a mechanism for promoting universal service.

Encouragement of Efficiency

Is price cap regulation essentially rate of return regulation with a long lag? Weyman-Jones (1990) argues that "...where rates of technical innovation are highest, minimum efficient scale of a subset of product services is low, and comparative performance can be evaluated, the RPI-X framework becomes in effect a method for stimulating competitive pressures, and differs significantly from rate of return regulation." (p. 76) Price cap regulation in the UK has been associated with general price reductions for services (due to innovation and cost containment) and with relative price changes--so-called re-balancing. Attenborough, Foster, and Sandbach (1993) analyzed four services, exchange line rentals, and local, national and international calls. The basic rebalancing of local vs. long distance prices has been substantial, with the latter almost halving in real terms. Using reasonable estimates of demand elasticities, they show what prices would have been without rebalancing. They estimate the total welfare gain to be roughly two billion pounds per year in 1990/91 prices. About 70% of this improvement came from general price reductions--reflecting improvements in production efficiency, with 30% of the welfare gain arising from movements towards Ramsey pricing. Taking into account an access externality effect, they estimate that an additional 20% welfare gain could be obtained by further movement towards Ramsey pricing, where equal weights are applied to the gains of all parties.

The fundamental characteristic of price caps is the decoupling of price from costs. While this technique violates conditions for allocative efficiency, the induced cost savings have been substantial. When prices are decoupled from a firm's own costs, the firm is rewarded for superior performance, and penalized for lackluster outcomes. Clearly, generalized mechanisms, as opposed to targeted reward systems, provide firms with a broad-based incentive to control costs and to introduce new services. Another main benefit from price caps may come from flexibility--encouraging the incumbent

to develop new rate designs that better reflect incremental costs. However, pure price caps have their own limitations. The practicalities of limited competitive pressure, politically powerful customer groups, and meeting other regulatory objectives has led to modifications in pure price caps.

Asymmetric regulation has characterized most jurisdictions where price caps have been utilized to promote efficiency. That is, incumbent firms have been constrained in a variety of ways to provide an opportunity for potential entrants to "test the water". Oftel's policies in the UK have assisted Mercury and other entrants in four ways: controlled rebalancing of prices--slowing the fall in long distance charges; low interconnection charges which helped Mercury; permitting entrants freedom, while forcing BT to have uniform charges over all geographic areas; excluding BT from some markets, including transmission of entertainment services, facilitating cable entry into local telephony (Attenborough, 1993).

The static and allocative efficiency implications of such constraints are all negative. The expectation is that the dynamic gains from having multiple centers of initiative in the future will outweigh the short term inefficiencies. The "infant firm" justification for protection has its detractors--but policy-makers seem to view managed competition as a good response to a what could be characterized as a Problem of Second or even Third Best. Neri and Bernard (1994) conclude that the difference between the U.S. and U.K. experience is in the competitive pressures faced by incumbent dominant firms. BT's pre-tax return on investment was roughly 20% from 1984-1993, so that increases in the productivity adjustment were in fact responses to high returns. Thus, the British experience resembles this aspect of ROR regulation. During the transitional period, competition complements price cap policy. Without competition, regulators introduce sharing rules or tighter "X" adjustments.

2. Concluding Observations

The fundamental tension between regulation and competition is widely recognized. Reliance on the competitive marketplace to set prices and determine new service introductions is inconsistent with an agency setting prices for an incumbent. Continued command and control regulation creates opportunities for corporate gaming of the political system. When government intervention, rather than actual market performance, determines which firms are winners and which are losers, corporate executives have an incentive to devote resources to lawyers and consultants rather than to scientists and engineers. Similarly, when regulators exercise substantial discretion (without clearly defined objectives articulated in the law), cohesive customer and supplier groups are encouraged to plead for special treatment. The hearing room rather than the industrial laboratory becomes the focus of attention. This tendency is most unfortunate, though nearly irresistible since such stakeholders have political power. Elected officials are tempted to continue to micromanage the industry. Policy initiatives such as price caps should not wait until all uncertainties about their consequences are resolved. Technologies and demand patterns do not stand still. In telecommunications, industry performance will be affected by how regulators adapt to changes in basic conditions facing private decision-makers. We know that regulatory rules from previous eras are unlikely to ensure that emerging industry structures will provide services at least cost. The real debate surrounds the types of transitional regulation suitable for this period of disruptive changes. Traditionally, U.S. regulators have served as buffers--delaying structural adjustments, but protecting some consumer groups and some suppliers from market dislocations. The operative term is *some*, since protectionism for some means that other customers and suppliers cannot take advantage of new commercial and technological opportunities.

The tendency towards traditional regulation and protectionism arises not only because the stakeholders who benefit from the status quo understand and communicate their interest. There is

another factor: no one likes to make mistakes, where mistakes are defined as outcomes that are regretted in retrospect. Yet, mistakes are inevitable in a world of uncertainty; for example, an investment might have a high payoff during a business expansion, but would be regretted in a downturn. Making what turns out to be a mistake, such as investing and then discovering that a downturn is occurring, is not a "bad" decision if the firm is not unduly risk averse and if the probabilities of failure were correctly calculated at the project analysis stage.

Each of us, whether analysts, regulators, politicians, or business executives, will try to camouflage our mistakes. This tendency can be restated as *Berg's Law*: "Given that mistakes will be made, decision-makers will try to make mistakes that are difficult to detect." Since a clear and decisive act may turn out, in retrospect, to have unintended consequences or be inconsistent with future economic developments, policy-makers will tend to avoid the explicit prioritization of outcomes. Most decisions to change a policy have multiple impacts, so detection of a mistake is less likely if policy-makers can point to the outcome and identify its positive features as reflecting their intended objectives!

The elevation of the status quo is understandable, if misguided, for another reason. Maintaining the status quo is relatively safe. If the decision to continue current policies is incorrect, the costs are not readily visible. An example of placing different weights on sins of commission versus sins of omission is the FDA rejecting a beneficial drug. It is far more costly to the bureaucracy to accept what turns out to be a harmful drug than to reject a very beneficial one. The political penalties for the two types of errors differ. In the case of regulatory agencies, a greater burden of proof is required for a policy modification in the face of technological changes, making it more likely that the status quo will be maintained. For example, regulators might consider permitting greater downward price flexibility by an incumbent firm and allowing it to make some new service offerings. Since recent entrants will oppose such policies, regulators may delay a decision allowing greater

flexibility until uncertainties are reduced. The costs of deciding to maintain the status quo are difficult to detect unless a firm's financial viability is threatened.

The shift to price caps and incentive regulation in the late 1980s has a number of explanations. Regulators have asked how risk-taking investment activity can be encouraged for the creation of telecommunications infrastructure and for the development of ancillary services. Thus, international and cross-state comparisons have begun to assume greater significance in the evaluation of policy alternatives. Regulators in many jurisdictions have concluded that adherence to the status quo via traditional regulation and protectionism is unlikely to encourage entrepreneurial activity by incumbent LECs.⁴ Technological developments have stimulated the ATT-McCaw partnership and cable TV company partnerships with competitive access providers (CAPs). These new strategic alliances will ultimately encroach onto LEC markets, regardless of state policies. The regulatory issue has become one of how to give the incumbent LECs the flexibility needed to respond to competition--while ensuring that predatory activity does not occur and while protecting residential customers.

What happens if policy-makers reject a new policy initiative such as price caps when the change would represent an improvement over the status quo? Some policy-makers are more willing to tolerate these types of errors given their risk aversion and their concern that some negative outcomes might occur. For example, telecommunications regulators might hesitate to implement pure price caps which could boost corporate profits, thereby causing negative public reaction. But the end result for consumers also can be better telecommunications systems and easier access to new services. Often, policy-makers treat the policy choice as a zero-sum game instead of a win-win situation. Many industry analysts argue that taking a more comprehensive approach toward deregulation, despite the risk of mistakes, would lead to greater innovation. Consumers as a whole would be better off. Creative policy-making involves identifying these win-win policy options.

⁴Greenstein, McMaster, and Spiller (1994) present empirical tests which indicate that incentive regulation, and especially price caps, promote LEC network modernization.

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