Incentive Regulation in Practice: A Massachusetts Case Study

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Abstract

The Massachusetts public utility commission has pursued policies to promote competition and efficient pricing in telecommunications since the divestiture of AT&T in 1984. As part of this effort, the Massachusetts Commission approved incentive regulation for AT&T and Verizon – the only two companies for which prices were regulated in the state. This article is a case study of what preceded the incentive plans, how the plans themselves were decided, and what came after.

1 Introduction

The Massachusetts Department of Telecommunications and Energy (Massachusetts Commission or Department, known as the Department of Public Utilities prior to November 1997) approved incentive regulation plans in the 1990s for the two telecommunications carriers for which it regulated prices – AT&T and Verizon.¹ This paper is a case study of the adoption of these plans, including a description of what led up to these plans, how they were decided, and what came after.

The decisions made by the Massachusetts commission were largely driven by good economic principles and the experience gained in other states, the federal government, and other countries with incentive regulation plans. However, some decisions were driven by the practical realities of what was politically feasible and what decisions were being made by other states. The case study that follows is not an exhaustive review of all issues that were faced and decided, but covers most of the more contentious and interesting issues that one state utility commission faced before, during, and after ten years' experience with incentive-based regulation for telecommunications companies. It is not possible to assess the success of the incentive plans that the Department instituted for AT&T and Verizon,

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¹ In the early 1990's Verizon was New England Telephone and Telegraph Company or NET in Massachusetts. In 1994, NET chose to brand its services with the name of its parent company, NYNEX. NYNEX was then merged into Bell Atlantic, which became Verizon when it merged with GTE. Because this case study covers this entire period, all of these names may be used in this paper, as well as referring to Verizon as the "Company."

compared to previous performance under cost-of-service regulation because the level of competition faced by both firms during this time was significant and growing. Therefore, any improvements in performance and efficiency could well have been a function more of competitive pressure than of regulatory mechanisms.

1.1 Background and history of telephone regulation in Massachusetts

Just after the divestiture of AT&T in 1984, the Massachusetts Attorney General – the consumer advocate in Massachusetts – petitioned the commission to investigate intrastate competition, and, after a two-year investigation, the Massachusetts Commission issued a decision that set the policy direction and framework for regulating telecommunications in the state that continues to this day (Massachusetts Department of Public Utilities 1731, 1985)².

In that Order, the Department established telecommunications policy goals and adopted an overall regulatory framework and pricing approach flexible enough to react to marketplace changes.³ The Department determined that while simulation of the results of a competitive market is a principal goal of regulation, actual competitive telecommunications markets are preferable to regulation as a surrogate for competition. The Department endorsed competitive markets over regulation as the best way to achieve its policy goals for telecommunications, because competitive markets promote economic efficiency, technological innovations, and a greater sensitivity to customer demands.

In that Order, the Department also created a regulatory classification of carriers as “dominant” or “non-dominant,” in order to determine the level of price regulation that would be applied to all common carriers. Under this classification, dominant carriers were subject to traditional regulatory requirements, and non-dominant carriers were presumed to be disciplined by market forces and to have no ability to exercise market power. Dominant carriers were allowed to petition for a change in classification in response to marketplace changes. While retaining traditional rate of return regulation for New England Telephone and Telegraph (“NET,” now Verizon) and for AT&T as dominant carriers, the Department stated, “[I]f an entire service class is determined to be fully competitive by the Department, we may find that the prices set by the market are fair and reasonable, and we will regulate such service class in accordance with the minimum statutory requirements. Such a determination may be made only upon a showing by [the carrier] that such a service is fully competitive.” Thus, the Department anticipated that markets could reach a point where competition, rather than regulation, would govern the prices for some of a dominant carrier’s retail telecommunications services.

With the endorsement of competition as the best way to achieve its policy goals of efficiency and fairness, it became necessary for the Massachusetts Commission to confront the problems associated with the traditional regulatory policy of pricing services without reference to cost-causation. The Massachusetts Commission addressed the pricing issue in D.P.U. 1731, 1985, when it determined that “properly defined incremental costs should be used as the primary basis for pricing all services, including local exchange service,” and also found that “to the extent that current rates do not reflect an appropriate allocation of

² Hereafter referred to as D.P.U.

³ The three public policy goals adopted by the Department in D.P.U. 1731, 1985, were economic efficiency, fairness, and universal service. The Department later adopted the additional policy goals of simplicity, earnings stability, and continuity (D.P.U. 86-33-C, 1987).

costs, the Department will, consistent with the need to avoid major discontinuities in rate levels, move toward that goal.”

Beginning in 1986, the Department conducted a multi-phase investigation into the costs and rates of NET, including approval of a marginal cost study (D.P.U. 86-33-0, 1990). The Department then began a series of annual, revenue-neutral “rate re-balancings” to bring NET’s retail rates more in line with the underlying cost structure (D.P.U. 89-300, 1990; D.P.U. 91-30, 1991; D.P.U. 92-100, 1992; D.P.U. 93-125, 1994). Those rate-rebalancings took place from 1989 to 1994. In that process, the Department significantly reduced rates for business customers and toll, local usage, and switched access services, as well as eliminated message units and different rate groups for local unlimited service. The Department also increased rates for some basic residential services, including the fixed rate for a dial-tone line, and for analog private line services.

In early 1994, the Department opened an investigation “to determine and put in place the structural components necessary to ensure continued development of open markets in Massachusetts, relying on competitive forces wherever possible, in order that the benefits associated with competition will be realized by all telecommunications customers in the Commonwealth.”⁴ That investigation focused on many of the issues that were subsequently addressed in the federal Telecommunications Act of 1996 (Act). The Act became law prior to completion of the Department’s local competition investigation, so the Department ended most of its investigation and shifted its focus to implementation of the federal requirements. Since that time, the agency’s time and resources have been devoted to implementation of the Act in terms of wholesale services, and to the cases described in the following sections of this paper for retail regulation.

2 Incentive regulation for telecommunications in Massachusetts

2.1 Incentive regulation for AT&T’s interexchange services

In 1992, the Massachusetts Commission investigated and adopted an alternative form of regulation for AT&T’s provision of interexchange services. This investigation came about as a result of a failed petition by AT&T in 1990 to be reclassified as a non-dominant carrier. In denying AT&T’s petition for reclassification, the Massachusetts Commission noted that AT&T had not been in for a full, cost-of-service rate case for several years and directed AT&T to make such a filing.⁵

As an alternative to filing a rate case, AT&T filed a petition requesting that the Department adopt an alternative form of regulation for AT&T’s Massachusetts intrastate services (D.P.U. 91-79, 1992). AT&T proposed that certain of its services be classified as “Category M” (that is, sufficiently competitive) services, with prices set by competitive market forces, and its remaining services classified as “Category D” services, with prices regulated according to a price cap. Category D consisted only of basic toll services, and the price cap was set at 17.6 cents per minute. In classifying the majority of AT&T’s services

⁴ D.P.U. 94-185, 1995.

⁵ In D.P.U. 90-133, 1991, the Department directed AT&T to make two separate filings. The first filing would have included general tariff revisions reflecting a revenue requirement determination. The second filing would have included a fully distributed cost study and a marginal cost study for all of AT&T’s intrastate services.

as Category M, and thus subjecting those services to reduced regulatory scrutiny, the Department stated that “sufficient market forces are in place to ensure that rates charged by AT&T for its proposed Category M services are just and reasonable.” The Department based its decision on an analysis of market share, supply elasticity, and demand characteristics, and concluded that AT&T did not have market power in Massachusetts with regard to Category M services. In making this decision, the commission stated:

A high output-based market share reflects significant market power only when the supply elasticity of other firms is relatively low. Therefore, a comprehensive analysis of AT&T’s market power must consider the market’s dynamic conditions. The evidence presented in this case strongly suggests that the supply elasticity and demand characteristics of the relevant market are such that should AT&T increase prices to levels significantly in excess of marginal cost, Category M customers will have the incentive and ability to purchase telecommunications services from carriers other than AT&T, and AT&T’s competitors (current and potential) will be able to meet this added customer demand by expanding their service availability.⁶

Regarding AT&T’s Category D services, the Department found that, although there was not as much competition as with Category M services, there was some competition since Basic (low volume) long distance customers had alternatives to AT&T for long distance service. The Department determined that any market power that AT&T had was the result of demand inertia and not bottleneck control of the market. Thus, the Department found that rate of return regulation would not be necessary. The Department determined that the weighted-average price cap mechanism it approved for AT&T contained sufficient regulatory safeguards which, coupled with market forces, would result in just and reasonable rates for AT&T’s Basic long distance customers. Except for Basic long distance and operator services, prices for AT&T’s services were regulated according to market-based pricing principles, in the same way that the Department regulated prices of services offered by non-dominant carriers.

In 1996, the Massachusetts Commission approved a request by AT&T to be reclassified as a non-dominant carrier for all intrastate services, thus ending the alternative form of regulation and deregulating, but not detariffing, AT&T’s intrastate services.⁷

2.2 Price cap regulation for Verizon

2.2.1 Introduction

In the fall of 1993, at a meeting with the Massachusetts commissioners, NET was asked why it had not yet proposed any form of replacement for traditional cost-of-service regulation in Massachusetts. The company representatives replied that they had been focused on implementing the rate-rebalancing requirements, but that they were in favor of considering an alternative form of regulation, and would be willing to make a proposal if the commissioners were inclined to consider it. The commissioners indicated that they would welcome such a proposal, so the stage was set for investigation of a proposed alternative form of regulation.

On April 14, 1994, Verizon filed with the Massachusetts Commission an Alternative Regulatory Plan for its Massachusetts intrastate operations. Instead of continuing to regulate the Company’s expenses, revenues, and earnings, the Company proposed that the

⁶ D.P.U. 91-79, 1992.

⁷ Massachusetts General Laws, c. 159, § 19 requires tariffing of rates, terms, and conditions for all intrastate common carrier services. The Massachusetts Commission has no ability to forbear from this statutory requirement.

Department regulate its prices, in accordance with a “price cap” form of alternative regulation. The “price cap” mechanism would allow the Company to change prices each year based on an index that accounts for inflation, a pre-determined productivity offset, and exogenous cost changes. The investigation was docketed as D.P.U. 94-50. Under Verizon’s proposal, there would also be regular measurements of service quality with penalties for sub-par performance, and there would be no earnings review or earnings sharing.

The commission, after a year-long investigation, approved a price cap for Verizon for a six-year term using the standard “Inflation – X” price cap index, with adjustments for exogenous costs and service quality, and no provisions for earnings measurements or sharing. The mechanics of the price cap were that the weighted average of rates at the start of the plan was indexed at 100, and each annual filing would cap the weighted average of rates at the previous years index plus or minus the changes required by that year’s price cap formula. For example, in the first year, the index of 100 was reduced because the price cap formula resulted in a negative number. Because the X factor exceeded the rate of inflation in each year of the Plan, Verizon was required to reduce its aggregate rates in each of the six years of the plan.

The investigation of Verizon’s filing resulted in a 500-page order on May 12, 1995 (D.P.U. 94-50, 1995). This paper does not review the findings on each and every item – only the more significant or interesting items.⁸

2.2.2 Cast-off rates

The first significant issue that the Massachusetts Commission faced in its investigation was whether it was necessary to conduct a full rate case to determine whether the “cast off” rates for the price cap were reasonable--in other words, to determine whether Verizon was over-earning. In an early procedural order, the Commission decided:

[T]he scope of inquiry into the reasonableness of NYNEX’s current earnings as an appropriate starting point for the Plan will be as follows: (1) any matter concerning the reasonableness of the current level of earnings, including the Company’s study period expenses, revenues, and investment, may appropriately be the subject of inquiry by parties in this proceeding either through cross-examination or by presentation of direct testimony by intervenors, jointly or severally; and (2) any party may seek to rebut the presumption that the Company’s currently adjudicated and authorized rate of return is *prima facie* reasonable. Although the Department recognizes that intervenors may examine the Company’s earnings, it hereby confirms that cost allocation and rate structure issues are beyond the scope of the present proceeding.⁹

The Commission’s intent in setting out this scope of earnings review was to conduct a limited review of earnings for the purpose of generally assessing the reasonableness of then-current rates. In practice, however, the review ended up being tantamount to a rate case, with a full investigation of the prudence of expenses and investments, establishment of a reasonable return on equity and capital structure, and investigation of affiliate transactions. This part of the investigation of Verizon’s proposal ended up being so demanding that the commission was forced to bring its rate case team from another staff division (supplementing the Telecommunications Division staff) to conduct the review. The result was that the Commission found that Verizon’s revenues exceeded its cost of service by \$216,000, which was 0.0001 percent of the company’s then-current intrastate

⁸ The actual order can be found at <http://www.state.ma.us/dpu/catalog/3081.htm>.

⁹ D.P.U. 94-50, July 14, 1994 Interlocutory Order.

revenues, so the Commission found that the then-current rates were appropriate as cast-off rates for the plan.

Another threshold issue was what to do with certain “investment commitments” that Verizon included in its proposal. Verizon committed that, if its plan was approved, it would make certain investments to extend its fiber-based broadband network and digital switching system, among other things. The commission determined that it would not investigate the reasonableness of these investments, nor would it base its review of the price cap on the investment commitments – rather, the proposal would be evaluated on its merits alone.

2.2.3 Productivity offset (X factor)

The components of the price cap index of course were another significant area of the investigation. Verizon’s proposed inflation measure, Gross Domestic Product-Price Index, was non-controversial, but the company’s proposed productivity offset was, as expected, a matter of great contention. Verizon proposed a productivity offset of 2.5 percent, reflecting a two percent “total factor productivity” or “TFP” differential, plus a 0.5 percent consumer productivity dividend. The TFP differential is the difference between the TFP of the economy as a whole and the TFP of the industry or firm in question over a chosen time period. This differential could be a positive or negative number, but, since the telecommunications industry has been more productive than the economy, the TFP differential has always been a positive number. The Attorney General advocated a productivity offset of 6.2 percent, consisting of the following components: 2.6 percent TFP factor; 2.6 percent input price differential; and 1.0 percent consumer productivity dividend.

The Commission decided on a 4.1 percent productivity offset, which consisted of a 2.0 percent TFP factor, a 1.0 percent consumer productivity dividend, a 1.0 percent “accumulated inefficiencies” factor, and a 0.1 percent input price differential. In terms of TFP and input prices, the most significant point of contention between Verizon and the Attorney General was the relevant time period. Verizon advocated using as much historical data as are available (60 years), and the Attorney General argued for using only post-divestiture data. The Commission found that TFP fluctuates significantly over time, and that it would not be appropriate to use just one relatively short time period – post-divestiture – when TFP was above its historic average. Therefore, the Commission approved Verizon’s proposed 2.0 percent TFP component. The Commission also used historic data for setting an input price differential component of 0.1 percent.

While the TFP and input price components of the productivity offset are based on studies of actual data, the consumer productivity dividend and other factors are subjective. There are no data to support a projection of how much more productive a regulated company will be under price cap regulation than it was under cost-of-service regulation. But, if one accepts the premise that firms under “cost plus” regulation have a diminished incentive to operate efficiently, as the Massachusetts Commission did, then it is reasonable to conclude that the historic TFP differential between the industry and the economy as a whole understates the expected productivity differential under incentive-based regulation. The problem is in guessing by how much forward-looking productivity will improve. The Attorney General estimated 1.0 percent, and Verizon estimated 0.5 percent. The Commission concluded that 1.0 percent was the appropriate estimate based on its judgment. And if that were not subjective enough, the Commission stretched further in creating the “accumulated inefficiencies” component of an additional 1.0 percent.

The rationale for including the accumulated inefficiencies component is best expressed with an excerpt from the decision:

We agree that it is likely that inefficiencies have accumulated and are contained in NYNEX's current rates. If the telecommunications industry has been operating less efficiently during the long-term period that is the foundation of the productivity offset than it would have under price cap regulation (a notion that must be acknowledged in order to accept price cap regulation as superior to ROR regulation in maximizing economic efficiency), then there must be accumulated inefficiencies that should be accounted for in the first term of a price cap plan. Since these inefficiencies have accumulated over time under the current ROR method of regulation, it is unlikely that these inefficiencies could be identified and removed from the Company's rates by conducting a full rate case. On the basis of the earnings review conducted in this case, the Department has concluded in Section VII, *infra*, that the Company's current earnings are reasonable, and, consequently, that the Company's current rates are the appropriate starting rates for the Plan. However, we find that our acceptance of the underlying rationale for approving price cap regulation, i.e., that the average firm under price cap regulation will be more efficient than the average firm under ROR regulation, requires us also to find that there are accumulated inefficiencies in the Company's current operations that the Department was unable to discover in its earnings review and would be unable to discover in a traditional rate case. These inefficiencies nevertheless should be accounted for in the price cap formula. Accordingly, the Department finds that it is necessary to add an additional one percent to the productivity offset, in order to account for accumulated inefficiencies.¹⁰

The accumulated inefficiencies factor was added also to bring the productivity offset in line with what other states had recently adopted in their own price cap plans. Most price cap plans for telephone companies in early 1995 had productivity offsets of around 4.0 percent. Since the TFP component of the productivity offset was based on actual studies and sound reasoning, it could not be adjusted, and a consumer productivity dividend of greater than 1.0 percent was not reasonable, there was a perceived need by some decision-makers to include some other component to bring the productivity offset in line with other states. That being said, there was and is a supportable rationale for including an accumulated inefficiencies component, which was later recognized by the Massachusetts Supreme Judicial Court (SJC) in a decision that overturned the use of the component in a price cap for a natural gas distribution company. The SJC overturned the accumulated inefficiencies factor in that case, but the court's decision was not a rejection of the rationale for an accumulated inefficiencies factor – in fact, the court endorsed the rationale – the court struck down the factor based on the Commission's inability to back-up its estimate with sufficient evidence.¹¹ Practically speaking, requiring evidentiary support for the estimate of accumulated inefficiencies is tantamount to rejecting it in concept for the simple reason that if there were evidence of inefficiencies, they would not have

¹⁰ D.P.U. 94-50, 1995.

¹¹ The SJC said:

The department's conclusion that inefficiencies are embedded in the company's cost of service as a result of [cost-of-service/rate-of-return] COS/ROR regulation is supported by substantial evidence. If one accepts the proposition that PBR is superior to COS/ROR because it encourages greater efficiency, the logical conclusion is that there must be inefficiencies embedded in the cost structure of [COS/ROR] regulated firms . . . If the underlying rationale of adopting PBR is that it drives a company to greater efficiency, the department can conclude, as a matter of common sense, that the company has built up inefficiencies under COS/ROR, and that the consumer should share in the gains as these inefficiencies are discovered and eliminated . . . we hold that the imposition of the accumulated inefficiencies factor was within the department's discretion and is supported by substantial evidence . . . [however] we find that the department's quantification of the accumulated inefficiencies factor is not supported by substantial evidence . . . the department has stated that it lacks information accurately to determine the correct amount of accumulated inefficiencies, and has offered no indication that its decision ever can be supported by substantial evidence. Therefore, a remand to the department would be futile . . . a judgment shall enter vacating those portions of the department's order that imposed an accumulated inefficiencies factor at 0.5 percent.

763 N.E.2d 1045, 436 Mass. 233, *Boston Gas Co. v. Department of Telecommunications and Energy*, (Mass. 2002).

accumulated in the first place – they would have been disallowed in previous rate case reviews.

2.2.4 Service quality

Recognizing that incentive regulation introduces incentives for cost savings that were not present under cost-plus regulation, the Commission informed Verizon that it must include a mechanism to ensure that Verizon does not reduce service quality as one way to achieve cost savings. Verizon proposed a set of service quality measurements and standards called the Service Quality Index (SQI). Under Verizon's proposal, if the company did not meet the SQI standards, it would not be allowed to increase any price for the number of months that it missed the standards. The Attorney General criticized this proposal on the ground that the price cap index may not allow price increases, depending on inflation and exogenous cost factors, and, under those circumstances, there would be no service quality penalty for sub-par performance. The commission agreed with the Attorney General's criticism of Verizon's proposal and replaced it with a "Q" component to the price cap index.

The "Q" component worked by increasing the productivity offset by one-twelfth of one percent in the subsequent annual filing for each month that Verizon missed the service quality standard. The commission also increased the standard that the company would have to meet. Under the company's proposal, the standard level of service was lower than the level the company had achieved in the twelve months prior to making its proposal. The commission found that this would permit a reduction in service quality from the then-current levels, and instead used the company's service quality in the twelve months from April 1993 to April 1994 as the standard.

Verizon did not propose, and the commission did not include, any type of reward for above-average performance in service quality. Therefore, under the terms of the plan, Verizon had a financial incentive to meet, but not beat, the service quality standards. Including a service quality reward mechanism was not considered or analysed in the investigation because no party raised it as an issue, but it has been considered by the Massachusetts commission in later years in the context of service quality plans for energy utilities. Initially, the commission rejected inclusion of a reward component because the legislature did not authorize it and because it was thought that companies should not be rewarded for meeting their public service obligations. Since that time, the Massachusetts commission has approved a service quality reward mechanism in an electric company's service quality plan in recognition of the incentives it creates for above-average performance.

2.2.5 Earnings sharing

Verizon proposed no earnings measurements or earnings sharing as part of its incentive plan. This was significant because, at the time, many states had included some form of earnings sharing in their approved price cap plans for telephone companies. A number of intervenors argued that the plan should include earnings sharing, and some even insisted that the plan must include some link to cost-of-service based earnings under state law.

As an initial matter, the commission undertook significant research into the legal question of whether it could consider a plan that determined the reasonableness of rates without reference to cost-of-service based earnings measurements. On February 2, 1995, the commission issued a 67-page interlocutory decision on a Motion to Dismiss filed by

the New England Cable Television Association (NECTA).¹² NECTA had argued that Massachusetts law requires a “nexus” between the regulated company’s revenue requirement and allowable rates and that Verizon’s proposal thus was illegal because it severed this nexus. The commission found that, under state law and judicial precedent, it was not limited to a specific regulatory scheme for determining that regulated rates were just and reasonable.

Having decided that it was allowed to consider an incentive plan without earnings sharing or an earnings measurement, the question in the main order was whether it should adopt such a plan. The commission decided that earnings sharing was not appropriate because it introduces many of the cost-of-service disincentives for efficiency that price cap regulation is designed to eliminate. The commission also did not want to have to rule on the prudence of investments in an increasingly risky and speculative industry, which would have been required for an earnings calculation. Also, earnings sharing would require an annual review of earnings, which the commission thought would be a significant administrative burden. Some parties suggested that the calculation of earnings in each annual filing could be a pro-forma exercise, but, as noted earlier, the commission’s own experience in the investigation of cast-off rates showed the difficulty, if not impossibility, of limiting the scope or depth of a review of earnings in an administrative proceeding. The commission decided that it did not even want to see a calculation of the company’s earnings, and, to this day, such a calculation has not been filed with the Massachusetts commission by Verizon.

The primary reason for not even calculating earnings was to avoid the temptation to recontract the plan. There was evidence that productivity could vary significantly on an annual basis, so the commission recognized that there could be significant variations in earnings from year to year. If earnings were calculated, there could be more temptation or political pressure to conclude that the plan had failed, based on reported earnings that were either above or below the level that the commission had deemed to be reasonable in evaluating the cast-off rates. Having concluded that reported earnings were largely irrelevant to an evaluation of the plan, the commission did not want to see them calculated during the duration of the plan.

2.2.6 Annual filings

The term of Verizon’s price cap plan was six years, starting in June 1995, with annual filings each June until June 2000. Each year, the company would calculate inflation, service quality, and any exogenous costs to determine the outcome of that year’s price cap formula. Then the company was free to propose any price increases or decreases, as long as its weighted average prices were below the indexed cap. The only limitations on specific price changes were that basic residential rates (dial-tone line and local usage) were frozen for the six-year term, and no price could increase any year by more than that year’s change in the Consumer Price Index (CPI). After the amount of time and effort that went into creating the incentive plan and defining the specific requirements, it was hoped that review of the annual filings would be relatively simple. Over the six-year term, the annual filings were more difficult than expected with some more controversial than others, with the second-to-last filing being the most contentious. With inflation less than 4.1 percent throughout the term of the plan, each annual filing resulted in an overall rate decrease.

¹² D.P.U. 94-50, February 2, 1995 Interlocutory Order.

The biggest issue in the first two annual filings was service quality, with Verizon having missed its SQI standards each of these years. Because Verizon missed its service quality standard, the productivity offset was increased in 1995 and 1996 by 0.83 and 0.33, respectively. After the first two years, the company met its service quality standards throughout the rest of the plan. Some within the commission wanted to conclude in the first two years that the service quality problems were evidence that the plan had failed or was not designed correctly, but the decision-makers instead viewed the service quality penalties as incentive for correction. In other words, the real test was whether the penalties would result in improved performance going-forward, which they did. However, it is fair to ask whether service quality improvements were driven more by competitive pressure than by the components of the price cap plan. There is strong anecdotal evidence that the service quality component did have an impact: it was reported to commission staff that Verizon senior management received service quality reports as part of their daily briefing after the penalties were levied.

In the third annual filing, there was a significant exogenous cost adjustment resulting in additional rate decreases. This exogenous cost adjustment was due to the deregulation of payphone rates as a result of the Telecommunications Act of 1996. Because payphone rates were deregulated, the price for a local payphone call increased from 10 cents to 25 cents, resulting in additional revenues for Verizon. The controversy here was that Verizon passed through the rate reductions to business and residential customers, but not to carrier access rates. MCI insisted that Verizon was required to pass some of the additional payphone revenues to access rates. The commission found that “neither [the Act] nor the FCC’s Payphone Orders require that LECs identify and quantify payphone subsidies by specific rate element or that subsidies be removed by reductions in specific rate elements, including switched access rates.”¹³ MCI then appealed the decision to the Massachusetts Supreme Judicial Court, which upheld the Commission, stating: “The statutory language contains no suggestion that the precise dollars comprising the subsidies must be traced back to the exact inflated rate(s) from which they sprang . . . we see no arbitrariness or capriciousness in the department’s approval of Bell Atlantic’s choice of which rates to reduce . . . judgment should be entered affirming the department’s order . . .”¹⁴

In the fourth annual filing, the most controversial item was Verizon’s aborted attempt to recover as an exogenous cost the revenues it was losing via reciprocal compensation. This request was opposed by the Attorney General and competitive local exchange carriers. The FCC’s orders on reciprocal compensation in February 1999 and subsequent decisions by the Massachusetts commission to end reciprocal compensation for Internet-bound traffic resulted in Verizon’s withdrawal of its request.

As noted, the fifth annual filing was the most controversial due to Verizon’s attempt to remedy what it considered the injustice of how it was continuing to be penalized for missing the service quality standard in the first two years of the plan. Because each year’s calculation began with the index cap from the previous year, any change to the price cap formula in one year flows through indirectly in every subsequent year. For example, the first annual filing started with a base of 100 for the price index. Inflation in the first year was 2.7 percent, the productivity offset was 4.1 percent, and Verizon was assessed a

¹³ Massachusetts Department of Telecommunications and Energy (hereafter referred to as D.T.E.) 97-67, 1998.

¹⁴ 755 N.E.2d 730, 435 Mass. 144, *MCI Telecommunications Corp. v. Department of Telecommunications and Energy*, (Mass. 2001).

service quality penalty of an additional 0.83 percent offset. Therefore, the new, weighted-average price cap was $100 - (2.7 - [4.1 + 0.83])$ or 97.77 percent. The following year, the base was 97.77 percent. In the fifth annual filing, Verizon argued that the second year base should have been $100 - (2.7 - 4.1)$ or 98.6 percent. In this way, Verizon argued, it was penalized in every subsequent year for sub-par performance in only two years.

Verizon discovered this “flaw” in the formula and attempted to correct for it in the fifth annual filing, arguing that it should not be penalized in subsequent years for service quality problems that it had corrected. Verizon proposed to lower the productivity offset for the fifth and sixth annual filings in order to “correct” for the “flaw.” The commission rejected Verizon’s request in a 4-1 vote on the ground that “Verizon’s proposed adjustment to the productivity factor [is] an attempt to change the price cap formula and pricing rules . . . There is no provision in the pricing rules for adjusting . . . the productivity factor to remove the indirect service quality penalty.”¹⁵

While there was some concern that it was not the Commission’s intent to punish the company for the whole term of the plan for service quality problems that occurred at the start but were subsequently corrected, a simple analogy (not cited in the decision itself) showed that this type of compounding was not uncommon.

Assume that two employees of a company each start with an hourly pay of \$10.00. Employee A meets her objectives for the year, but Employee B does not. If the company is giving out raises of ten percent to employees who meet their objectives, but no raises to employees who do not, then Employee A’s hourly wage in year two will be \$11.00, while Employee B continues to make \$10.00 per hour. If both employees meet their objectives in year two, then they each receive the ten percent raise, and Employee A’s hourly wage in year three will be \$12.10, and Employee B’s hourly wage will be \$11.00. Assuming that both employees meet their objectives in every subsequent year, Employee B’s salary will never catch up to Employee A’s. Therefore, Employee B will continue to be punished for missing his objectives in his first year of employment in every subsequent year. This analogy helped the majority of commissioners see that what Verizon considered to be a flaw in the price cap plan was actually just a common effect of compounding. This is not a perfect analogy since the price cap plan did not include any reward for superior performance, whereas an employee usually has an opportunity to make up for sub-par performance with above-average performance in later years.

The sixth and last annual filing was the only one in which there were no serious controversies.

2.3 Replacement for Verizon’s price cap plan

On February 27, 2001, after Verizon made its sixth annual price cap filing, the commission directed Verizon to file a proposal for regulation of its retail telecommunications services in Massachusetts.¹⁶ On April 12, 2001, Verizon filed its proposed Alternative Regulation Plan, which included, among other things, a rate freeze for basic residential services, deregulation of prices for business services, and continuation of the service quality plan with penalty mechanisms. The commission’s investigation of the Plan was docketed as D.T.E. 01-31. The commission concluded that, in Verizon’s proposed Plan, Verizon was,

¹⁵ D.T.E. 99-102, 2000.

¹⁶ D.T.E. 01-31, February 27, 2001 Vote and Order to Open Investigation. The Department directed Verizon to file a proposal that included, at a minimum, a component for regulating or deregulating retail prices, regulating service quality, and intrastate access charge reform.

in effect, requesting classification of a large portion of its services (i.e., business services) as sufficiently competitive to permit market-based pricing of such services, and was proposing an alternative to traditional cost-of-service or indexed price cap regulation for the remaining services. After receiving comments on the appropriate scope of the proceeding, the commission bifurcated its investigation, determining that the first phase of the proceeding would investigate whether there was sufficient competition for the services for which Verizon sought pricing flexibility in its proposed Alternative Regulation Plan (i.e., Verizon's retail business services).¹⁷ Following an investigation into the state of competition in Massachusetts, on May 8, 2002, the Department issued its Order in Phase I of this proceeding (D.T.E. 01-31, Phase I, 2002).

2.3.1 Phase I order

In D.T.E. 01-31, Phase I, 2002, the Department employed a three-pronged market power analysis of supply elasticity, market share, and demand elasticity, to find that Verizon had successfully demonstrated the existence of sufficient competition to warrant pricing flexibility for most of Verizon's retail business services.¹⁸ In making this determination, the commission said:

Of the three components examined in a market power study, supply elasticity of the competing firms is the most significant because, despite a high market share and a low market demand elasticity, a high supply elasticity can eliminate market power. The Department concluded that, with very few exceptions, CLEC supply elasticity is high, and the market is contestable. High supply elasticity will enable suppliers to discipline one another's conduct, and the resultant market behavior among competitors will protect buyers from market power abuse.¹⁹

The commission's findings on the contestability of the retail business market were primarily based on the availability of UNEs at forward-looking prices. Therefore, the commission granted Verizon's request for pricing flexibility for those retail business services whose components are available on a wholesale basis as unbundled network elements (UNEs). The Department concluded, however, that unlimited downward pricing flexibility for Verizon's retail business services could enable Verizon to engage in a "price squeeze" with respect to UNE-based competitors. Consequently, the Department implemented an enhanced price floor for Verizon's retail business services, equal to the density zone-specific UNE rates for the elements that make up the service, plus a mark-up for Verizon's retailing costs as reflected in the wholesale discount.

With respect to Verizon's basic residential services, which would remain a regulated, dominant carrier offering, the Department offered tentative guidance that prices would be judged to be just and reasonable as long as they were between a range of incremental cost as a floor and stand-alone cost as a ceiling. Wholesale services, such as UNEs, interconnection, and resale, would continue to be regulated as monopoly services, pursuant to the requirements of the Telecommunications Act of 1996. The Department directed Verizon to submit to the Department a plan for regulatory treatment of its retail services consistent with the requirements set forth in D.T.E. 01-31, Phase I, 2002.

On June 5, 2002, Verizon submitted its Phase I compliance filing incorporating both the Department's directives regarding Verizon's retail business services and the

¹⁷ D.T.E. 01-31, June 21, 2001 Interlocutory Order on Scope.

¹⁸ Consistent with Department precedent, a finding of sufficient competition for a telecommunications service permits the Department to allow pricing flexibility for that service. See, D.P.U. 91-79, 1992; D.P.U. 88-18-A, 1988; D.P.U. 85-275/276/277, 1985.

¹⁹ D.T.E. 01-31, Phase I, 2002.

Department's tentative guidance regarding Verizon's retail residential services. The Department determined that Phase II of D.T.E. 01-31 would consist of an evaluation of Verizon's compliance with D.T.E. 01-31, Phase I, 2002, as well as an investigation into proposals for regulatory treatment of Verizon's retail residential services and service quality plan.

2.3.2 Phase II order

On April 11, 2003, the Massachusetts commission issued its order in Phase II (D.T.E. 01-31, Phase II, 2003). In that decision, the commission found that it would not be consistent with the Department's goal of rate continuity to establish a floor of imputed incremental costs plus retailing costs for basic residential services. Establishing such a price floor would require over a \$6.00 per month increase in the residential dial-tone line rate. However, in order to move basic exchange rates closer to economically efficient levels and improve conditions for local exchange competition, while meeting the statutory obligation to ensure just and reasonable rates, the commission determined that a one-time increase of \$2.44 in Verizon's dial-tone line charge was appropriate, with no further pricing flexibility absent a Verizon demonstration of sufficient competition.

The Attorney General had urged the commission to conduct a traditional cost-of-service assessment to determine whether Verizon's rates for basic residential services were just and reasonable. The Commission rejected this approach, saying:

[G]iven that business services have already been granted upward pricing flexibility in our *Phase I Order*, and non-basic residential services have been subject to market-based pricing since the Department's first rate re-balancing order (D.P.U. 89-300 (1990)), the Department recognizes that conducting an embedded cost-of-service study today for only one set of Verizon customers would be difficult and, more importantly, would not produce an economically rational result. This is because the allocation of joint and common costs shared between business and residential services, as well as basic and non-basic residential services, would be unacceptably arbitrary. Moreover, we agree with AT&T that the allocation methodologies of a cost-of-service study often result in rates and costs that are inconsistent with cost-causation principles. In addition, unlike forward-looking economic costs, embedded costs focus on historic accounting costs instead of the costs that an efficient firm would face going forward. We also remain concerned that cost-of-service regulation may facilitate a regulated company's ability to cross-subsidize competitive services with revenues from regulated services. *Phase I Order* at 99.²⁰

The commission also rejected use of an "inflation minus productivity" price cap index for regulation of basic residential services. The reason for this decision was that an "inflation minus productivity" price cap is designed to control the aggregate prices and earnings of a regulated company, and not to determine just and reasonable rates for any particular rate element. The commission also noted that application of a price cap index to prices for services that are below incremental cost would require movement away from efficient pricing. The commission instead decided to use total-element, long-run incremental cost as the standard for judging the reasonableness of basic residential rates. The commission offered the following rationale for this decision:

[W]e conclude that TELRIC is the appropriate cost standard to meet [our] goals. AT&T argues that, because Verizon charges competitors more for the network elements necessary to provide a competing service than the marginal cost it incurs to provide the service itself, UNE-based competitors that require inputs from Verizon will not be able to compete unless Verizon's basic residential rates equal or exceed the sum of the TELRIC-based UNE rates of the UNEs that comprise basic residential service plus Verizon's retailing costs. Whereas Verizon may argue that

²⁰ D.T.E. 01-31, Phase II, 2003 (exhibit citations omitted).

its prices should be based on marginal cost or TSLRIC data, approval of such prices might enable Verizon to engage in an anticompetitive “price squeeze” by decreasing its retail rates until the margin between its price for basic residential service and the cost of the underlying UNEs is reduced to the point where UNE-based residential service competitors cannot efficiently compete with Verizon. Another factor weighing in favor of using TELRIC as the appropriate cost standard is that TELRIC already includes an allocation of joint and common costs. The allocation of joint and common costs in the TELRIC model is a fixed percentage, and thus is not consistent with Ramsey pricing principles. But, with the difficulties associated with setting Ramsey-based prices discussed above, it is an acceptable alternative to rely on a fixed percentage allocation, which at least moves in the direction of a more efficient allocation of joint and common costs. In effect, the Department concludes that our standard for judging the reasonableness of regulated rates for telecommunications services – whether wholesale or retail – should be harmonized by using the same cost standards [], and that this “bottom-up” approach is more compatible with determining individual rate elements, rather than the “top-down” cost analyses used in cost-of-service or price cap regulation, which are relevant only to aggregate determinations of revenue requirements.²¹

The commission said that ideally, Verizon’s basic residential rates should be set at least equal to the cost it imposes on its competitors to provide a competing service -- that is, the UNE rates underlying the competing services (averaged across the state for UNE prices that differentiate by zone), plus a mark-up equal to the resale discount percentage – but found that requiring this change would necessitate such a large increase in the price of basic residential service that it would be incompatible with the goal of rate continuity and would be politically infeasible.²² The commission instead found that a one-time increase of \$2.44 in Verizon’s dial-tone line charge represented a substantial movement in the direction of aligning local telephone rates with their underlying costs without burdening consumers with rate shock or potentially affecting the overall rate of telephone subscription in Massachusetts. The \$2.44 figure was chosen because it was proportionate with reductions to switched access and some other wholesale rates that the commission also ordered. Switched access rates were lowered to the interstate level so that it would not cost more to call across the state than it did to call across the country.

3 Conclusion

Regulation of AT&T and Verizon in Massachusetts has evolved from the traditional cost-of-service model, to incentive-based price caps, and now to deregulation. Whether the price cap plans were superior to the traditional model for regulating monopoly services cannot truly be evaluated from the Massachusetts experience due to the increasing levels of competitive pressures that were experienced during the duration of the plans. The plans certainly were more consistent with and less disruptive of the development of competition. Under the price cap plans, arbitrary cost allocations did not impact competitive prices, and the regulated companies had increased flexibility to change their prices in response to competitive conditions. Also, the companies could increase their productivity with no fear that all of the resultant savings would be extracted by the regulators for the benefit of customers. Certainly, customers saw greater rate reductions under incentive-based regulation than they had under cost-of-service regulation, but, again, this could have been more the result of competitive pressures in the early and mid-1990s.

²¹ D.T.E. 01-31, Phase II, 2003 (footnote and citations omitted).

²² Using the new UNE rates under review by the commission, this approach would require an increase of \$6.58 over Verizon’s current dial-tone line charge of \$9.91 (an increase of over 66 percent).

There will be no more incentive-based plans for regulation of telephone companies in Massachusetts, given the level of competition already present. But the lessons learned in the telephone industry are being applied to incentive plans for the energy industries. Mistakes that were made in the Verizon plan include the creation of an accumulated inefficiencies factor in part to bring the productivity offset in line with other states, a price freeze locking in inefficient rates for residential services, the lack of a reward for above-average service quality, and the lack of a tighter definition of exogenous costs, which would have avoided some of the controversies in the annual filings.

This case study offers a glimpse into the experience of one state with incentive regulation for telephone companies, highlighting some of the issues faced and some of the factors that went into the analysis on these issues. Based on the experience in Massachusetts, it is clear that any form of regulation introduces an inherent degree of subjectivity and distortion on the part of regulators, which is why competition and deregulation are the ultimate policy goals. However, the level of subjectivity present in a traditional “cost plus” rate case is greater than that in incentive-based regulation, and the incentives for company performance in incentive-based regulation are more like those found in competitive markets. For these reasons, incentive-based regulation is preferable to cost-of-service regulation for monopoly utility companies, and the Massachusetts Commission to date has been committed to extending incentive regulation to the energy industries. Meeting that challenge successfully will be easier due to the lessons learned in telecommunications, as recounted in this article.