CHAPTER 4
RATE ADJUSTMENT MECHANISM

This chapter describes the annual rate adjustment mechanism underlying the price cap plan. After a brief overview of price cap regulation, the chapter discusses the formula and components to be used to adjust prices annually including the input price index and the productivity factor. The extraordinary event adjustment factor is also briefly discussed. Further, the rate adjustment process is also discussed as well as the relation between a utility's chosen productivity factor and its ROE ceiling (i.e., its *potential* for earnings relative to its equity), which reflects the Board's approach to sharing. Finally, the role of price flexibility is discussed.

4.1 OVERVIEW

Among cap mechanisms, the price cap approach comes the closest to replicating the dynamics of competitive markets. In a competitive market, the price of a product reflects the cost of production and incorporates the influence of changes in the price of factors of production and in productivity gains. The individual firm takes the price as given and attempts to maximize profits by controlling costs through productivity improvements.

The price cap mechanism adjusts the ceiling for distribution service prices for changes in the unit costs of providing these services. The change in unit costs can be divided into (1) the change in the prices of inputs used in the distribution of electricity, and (minus) (2) the change in the utility's productivity (i.e., the efficiency of combining inputs into outputs).

The formula for the price adjustment mechanism is:

$$\%\Delta P_j^t = \%\Delta IPI_{LDC}^t - \%\Delta PF_K + \%\Delta Z_j^t \qquad [4\text{-}1]$$

where:

$\%\Delta P_j^t$ = the percentage change in the $j^{th's}$ distributor's price ceiling in year t;

$\%\Delta IPI_{LDC}^t$ = the percentage change in Ontario distributors' input prices from year *t-1* to year *t*;

$\%\Delta PF_K$ = the productivity factor or index expressed as a constant percent change each year for any given utility selecting the K^{th} combination of productivity factor and ROE ceiling; and

$\%\Delta Z_j^t$ = the extraordinary event adjustment factor expressed as a percent change from prices in year *t-1* to prices in year t for the j^{th} utility. See Section 4.4.

At the beginning of PBR, each utility will select one productivity factor from six possibilities ranging from 1.25 to 2.5 percent.[1] Utilities selecting higher productivity factors are allowed potentially higher earnings and higher ROE ceilings. As noted earlier, customers will also benefit when a utility chooses a higher productivity factor as this results in an immediate reduction in the change in rates. Each February within the term of the PBR plan, starting in 2001, the Board will publish the input price index adjustment for all electric distributors to apply to their annual PBR rate adjustment (e.g. for year 2 and year 3 of the first PBR plan). The combination of the change in the input price index published annually by the Board (applicable across all distributors) and the fixed productivity factor selected by the utility at the start of its PBR plan determine the new price ceiling in the absence of extraordinary costs. These components are discussed below.

4.2 THE INPUT PRICE INDEX[2]

The purpose of the input price index adjustment is to allow each utility the discretion to pass through changes in the prices of the inputs it purchases – at the rate determined by the *typical* distributor's experience with input prices during the previous year. A distributor whose own input prices rose less than the input prices of the typical distributor would increase its earnings if it chose to adjust its own price cap by the full amount allowed by the Board. On the other hand, a distributor whose own input prices rose more than those of the typical distributor would experience a reduction in earnings due to the allowed adjustment.

This input index is specific to the electric distributors in Ontario. The index comprehensively measures changes in the prices of inputs employed by the distributors including capital, labor and materials. The Input Price Index (IPI) is the index formed by the addition of sub-indices of input prices weighted by the cost share of each input. The reasons for choosing the IPI rather than the CPI are discussed in detail in the staff technical report. Research documented in the staff technical report notes that the input prices (excluding line losses) for Ontario distributors' rose approximately 1 percent per year below the Consumer Price Index (CPI) for the same period. Some variation across the distributors was evident with a few experiencing input price changes about 1 percent above and below the mean but most were relatively tightly clustered around the mean. Significantly, appreciable differences in the IPI by size of utility were not found.

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[1] Amalgamations among electricity distributors trigger a filing by the new entity and the opportunity for selecting a new PF.

[2] Board Staff report in preparation, "Productivity and Price Performance for Electric Distributors in Ontario," *OEB*, July 1999.

4.3 THE PRODUCTIVITY FACTOR AND SHARING

The purpose of the productivity factor is to account for the downward influence on the price of a utility's product from gains in efficiency broadly considered. That is, the productivity factor measures the potential for improvements in the physical relationship between outputs and inputs inherent in the production process of the distributor. A distributor whose actual productivity change exceeds its benchmark productivity factor could increase its earnings up to the ceiling on ROE. On the other hand, a distributor whose actual productivity change falls below its benchmark productivity factor could experience a reduction in earnings. The resulting ROE could be below the target, market-based ROE established in Table 3-1 presented in the previous chapter.

Due to biases in measuring productivity change based on any one input (e.g., labour) or even a subset of inputs (e.g., labour and materials), a measure of the distributors' productivity has been adopted that is based on a comprehensive assessment of the distributors' inputs. This measure (i.e., total factor productivity (TFP)) is designed to reflect the change in output that cannot be accounted for after controlling for changes in use across all inputs. Thus, while changes in TFP may be due to a number of factors, the interest is in establishing broad TFP benchmarks that reflect the experience of Ontario distributors without regulating the process or choices to achieve these benchmarks.[3]

TFP has been used extensively in the application of PBR in many regulated industries, including electric. The task forces and Board Staff reviewed many of these applications and the underlying approaches. The results of this review and analysis are reported in a staff technical report[4]. Significant effort has been made to standardize the measure of inputs across distributors, particularly capital, whose long life and varying age require a revaluation of a distributor's capital stock to place it on a consistent comparative basis. Of course, the proposed productivity factors and input price index are based both on empirical analysis of Ontario distributors as well as experience in other jurisdictions.

The results of these efforts to measure TFP for Ontario distributors are reported in the staff technical report on productivity. Research over the 1988 to 1997 time period as documented in the staff report finds that the average annual change in TFP across Ontario distributors was approximately 1 percent. Substantial variation exists across the distributors in their TFP performance – half of the distributors examined had productivity exceeding the average with many also exceeding 2.0 and 2.5 percent. Many of the utilities with above average TFP growth were also utilities found to have total costs per customer around or below the mean.

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[3] Here we are discussing economic choices and performance – not choices affecting service or reliability.

[4] Board Staff report in preparation, "Productivity and Price Performance for Electric Distributors in Ontario". OEB, July 1999.

Due to the varying circumstances facing utilities and differences across utilities in their potential for efficiency gains, the plan allows utilities to select the particular productivity factor from a set of six that it believes best reflects the combination of circumstances, opportunities, risks and rewards facing the utility. These productivity factors are presented in Table 4-1. Note that the default value for Option A is a productivity factor of 1.25 which is about 25 basis points above the distributors' average from 1988 to 1997. This means that, on average, ratepayers of distributors in the default option would experience a decline of 1.25 percent in real rates after which the distributor then has the opportunity for higher ROE above the target market-based rate of return. Associated with the 1.25 percent productivity factor (PF) is a ceiling of 10 percent on a distributor's ROE. Utilities selecting Option A whose actual productivity change falls below the target (i.e., 1.25 percent) would experience ROE below the target ROE (i.e., the market-based rate of return).

Table 4-1
THE RELATION BETWEEN PF AND ROE CEILING

Selection	Productivity Factor (percent change per year)	ROE Ceiling (percent)
A	1.25	10
B	1.50	11
C	1.75	12
D	2.00	13
E	2.25	14
F	2.50	15

As indicated in Table 4-1, the plan provides higher potential ROE (i.e., higher ceilings on ROE) for distributors selecting higher productivity factors at the start of their PBR plan. Thus, a utility selecting a productivity factor of 1.5 would have an ROE ceiling of 11 percent (i.e., in return for an additional 25 basis points reduction in its price cap per year, the utility would have the potential to increase its ROE by 100 basis points). Consequently, ratepayers would experience a reduction in their rates greater than if the utility had selected Option A and shareholders could potentially experience an increase in ROE relative to Option A if the utility's actual change in productivity *exceeds* the 1.5 PF.

If the utility's realized productivity change is sufficiently high enough to generate higher ROE, it would retain all earnings below the 10 percent ceiling. Failure to exceed its selected PF would result in actual ROE below the target, market-based return. For each option, the dead zone, where no sharing with the customers is required, is the range between the market-based rate of return and the ceiling. Thus, each utility has an incentive to find incremental efficiencies above the target. ROE is capped at 15 percent in Option F with a PF of 2.5.

Since the utilities are incented to exceed the target ROE in each option, each utility should do a careful assessment of its likely performance across several of the plan choices. Higher expected productivity change (e.g., 2.5) than that required in a given option (say, D) may still result in a utility selecting a lower PF option (say, 1.5) since the improved efficiencies associated with the TFP growth between 1.5 and 2.5 flow to the utility's bottom line.

Table 4-2 presents an analysis of a prototypical utility's choice. Presume that inflation is 2% per year and that the utility is able to realize 3% productivity per year. Since the productivity realized by the utility is greater than the PF selected by the utility, its ROE increases relative to the target (established at 9.5% in this case) Note that the ROE constraint for Option A limits the utility's return to 10 percent rather than the potential 10.2 and 10.9 percent in years 2 and 3 that the utility would otherwise earn in the absence of the constraint.

Table 4-2
ROE IMPACTS OF VARYING PRODUCTIVITY PERFORMANCE

	Option A PF=1.25	**Option B PF=1.5**	**Option C PF=1.75**	**Option D PF=2.0**
Year 1	9.5	9.5	9.5	9.5
Year 2	10.2[5]/10.0	10.0	9.9	9.8
Year 3	10.9[5]/10.0	10.6	10.3	10.1

Options at the higher end of the spectrum may be more appealing to utilities planning amalgamations or other significant restructuring of their operations. These options may likely require double-digit savings to meet the PF requirements and approach the upper range of the ROE ceilings. However, the correspondingly higher ROE ceilings have been structured – up to 15 percent – with these more demanding options. The plan also provides that ratepayers of such amalgamated or restructured utilities receive a corresponding portion of these "extraordinary" efficiencies by requiring utilities in these options to pass through larger reductions in prices.

The need to encourage utilities to continue to explore options for improved efficiencies, even after the selection of term option is also recognized. Therefore, for utilities undergoing amalgamation, during the term of the PBR plan, proposals by the new entity for increasing its PF and associated ROE ceilings will be considered.

[5] Utility's return before ROE constraint.

4.4 THE Z FACTOR

A Z factor has been incorporated into the PBR rate mechanism to address extraordinary events and transition costs. In order for costs to be included in the Z factor, the costs must satisfy four tests:

- Causation – the expense must be clearly outside of the base upon which rates were derived.
- Materiality – the cost must have a significant influence on the operation of the utility, otherwise they should be expensed in the normal course and addressed through organizational productivity improvements.
- Inability of Management to Control – to qualify for Z factor treatment, the cost must be attributable to some event outside of management's ability to control. Examples include a tax change or requirements of the IMO that result in expenditures by the distribution utility. On the other hand, an ice storm that causes extensive damage in a system with sub-par maintenance would not qualify for Z factor treatment.
- Prudence – the expense must have been prudently incurred. This means that the option selected must represent the most cost-effective option (not necessarily least initial cost) for ratepayers. For example, some utilities will need to upgrade their billing systems to deal with market opening. The prudence standard requires that the utility justify purchasing a new system versus outsourcing the function to a vendor, association, or utility.

The Z factor mechanism treats costs associated with extraordinary events differently than those associated with the transition to the new market. In this section, the eligibility of cost (both extraordinary and transition) is first addressed. In order to track both cost and revenue associated with qualifying costs, a balancing account will be established which is discussed in the second subsection. Finally, the calculation of the specific amount to be recovered in a specific year is then addressed.

4.4.1 Eligibility Criteria

As mentioned above, four criteria will be applied to determine the eligibility of costs for Z factor recovery. When a utility indicates wishes to apply for Z factor recovery, it must submit evidence that the costs/revenues which were incurred/received meet the four standards outlined below in its annual application.

Causation

The causation criteria differ for transition and extraordinary costs. Transition costs should be directly related to operational requirements created by the development of a competitive market.

A significant portion of the expenditure should be demonstrably linked to addressing new operational requirements, as opposed to upgrading current procedures and systems to gain efficiencies under the guise of addressing transition costs. To qualify as a transition cost, 75% of the costs should be directly and demonstrably linked to restructuring requirements.

For extraordinary event related costs, the revenue or expense must be clearly outside of the base upon which rates were derived (e.g. a computer systems upgrade that improves the billing system while addressing Y2K problems is partially a contingency and partially an operational expense and only the Y2K related portion of the costs is eligible for contingency treatment).

Materiality

Z factor treatment is reserved for costs which have a significant influence on the operation of the utility. An expense will be considered material if it involves 0.0025 percent of a utility's net assets. The definition of materiality will differ depending on the sign of the utility.

Inability of Management to Control

In some circumstances, an activity is not within management's control (e.g. a requirement to conform to a change in regulation, a tax change). Often many options are available to management to address a problem, each with various tradeoffs between cost and effectiveness. The utility will be required to supply the details of management's plans for addressing extraordinary event and transition costs in support of the utility's request for special cost recovery. The Board may limit the recovery of certain costs associated with activities.

For transition costs, management has a fair amount of discretion to determine its response to meeting the new operational environment facing distribution utilities. Utility management should actively consider the actions being proposed by other utilities and the associated costs in determining its plans to address industry restructuring requirements.

Prudence

The final standard is the prudence criteria. In supporting the prudence of the expense, the utility will need to justify the reasonableness of the cost relative to other options that the utility may have had. For example, if the utility must replace their billing system to deal with billing requirements for the new market, the cost incurred must be justified relative to other options that the utility may have such as outsourcing, purchase of a new system, or revision of the existing system.

4.4.2 Board Authority to Review

The Board reserves the right to review the amounts claimed under Z factor or transition cost treatment at any time during the term of the PBR plan.

4.4.3 Balancing Account

Those costs that pass the four-part test outlined above should be included in a balancing account(s). In submitting its annual data filing, the utility will then provide the amounts booked to the balancing account(s) in the previous year and will provide evidence that these amounts satisfy the four criteria listed above. Utilities will determine a disposition amount for the balancing account(s). The utility will then provide the basis upon which the disposition amount can be attributed to rate classes, including a discussion of the merits of alternative allocations considered. The disposition amounts allocated to each rate class from the deferral account should then be tallied, and a rate class specific prospective rate adjustment determined. The determinations above shall be filed with the Board in the annual data filing. The resulting revenue should be credited to the balancing account.

4.4.4 Disposition Amount

In determining the disposition amount, the utility must consider whether the expenses have benefits for future periods or not. If they do not have benefits for future periods, the disposition amount should be designed to recover all of the expense by the end of the next rate period. If the expense has future benefits, it should be capitalized and the amortization amount brought into the balancing account(s).

The size of the prospective rate adjustment will not be subject to a predefined limit. The absence of a predefined disposition limit will give individual utilities the flexibility to set the rate rider with due consideration to other rate related customer impacts.

The Board may adjust the class specific rate adjustments directly based on the information provided, may seek additional information from the utility and/or may request a review and report from the Board's Energy Returns Officer on the derivation of the rate rider.

4.5 PRICING FLEXIBILITY

Besides establishing an annual upper limit or cap to the prices charged by a distributor, the price cap mechanism allows a distributor some flexibility in adjusting prices below the cap and, in the case of amalgamations or mergers, around the cap.

4.5.1 Pricing Flexibility and Baskets

One overall price cap for the utility that imposes an average adjustment to all prices may prove unsatisfactory from several perspectives including limiting a distributor's ability to fine tune its cost allocation and its responsiveness to pricing pressures in particular sub-markets. With these considerations in mind, the PBR plan allows a utility to place customer classes into "baskets" with each basket having its own price cap.

For example, a utility could structure a price cap mechanism separately for baskets of residential, general service and large use customers subject to the following constraints:

(1) The results of the three price cap adjustments to the baskets do not produce an overall cap which exceeds the ceiling imposed on the utility's average price.

(2) None of the caps on individual baskets falls outside of a 5 % flexibility adjustment zone.

An example of the individual basket calculations and associated adjustment zones is illustrated in Table 4.3. To calculate individual basket caps and their associated adjustment zones, three steps are followed. The first step involves the proportional adjustment of the existing rates for the utility's overall price cap according to the current year class revenue requirement weighting. In the second step, the 5% flexibility zone around the adjusted rates is determined. The third step involves the selection of the flexibility adjustment and ensuring that the flexibility adjustments do not exceed the ceiling imposed on the utility's average price.

Table 4-3
Illustration of Pricing Flexibility Among Rate Baskets

	Residential Class	General Service Class	Utility Overall Rate Adjustment of ($3.00)
Existing Rates	$10.00	$35	
Step 1			
Class Revenue Weighting	30%	70%	
Adjusted Rate	$9.10	$32.90	($3.00)
Step 2			
Flexibility Range	$9.10 ± 5%	$32.90 ± 5%	
Max Adjusted Rates	$9.56	$34.55	$0.89
Min Adjusted Rates	$8.65	$31.21	($5.09)
Step 3			
Flexibility Option Taken	+4.5%	-1.2%	
Adjusted Rates	$9.50	$32.50	($3.00)

4.5.2 Pricing Flexibility and Amalgamations

In the event that utilities amalgamate, the PBR plan allows some pricing flexibility within the rate harmonization process. This process to harmonize overall rates between or among utilities following amalgamation should reduce the differences in rates by lowering those that are higher and raising those that are lower. However, the plan establishes a limit of $\pm$ 5% per year in the amount that an individual utility's pre-amalgamation average rate can change. Table 4-4 illustrates the calculation for two amalgamating utilities of equal size over a three-year process. Note that in year three, the full 5% adjustment is not necessary.

Table 4-4
Illustration Of Pricing Flexibility For Amalgamations

	Utility A	Utility B
Initial Rate	$30.00	$40.00
Year 1	$31.50	$38.10
Year 2	$33.08	$36.28
Year 3	$34.64	$34.64

Following harmonization adjustments to its average rate, an amalgamated utility may then apply the basket flexibility zone described in Section 4.5.1, subject to the imposed constraints introduced by the rate harmonization.

Some amalgamating utility may experience unique circumstances that require greater flexibility in harmonization or basket flexibility than is provided here. Utilities finding themselves in these circumstances may petition the Board in their annual filing for greater flexibility. Such petitions should clearly state the rationale and impact of the requested flexibility.

4.5.3 Pricing Flexibility and Contestable Services

At the commencement of the first generation PBR plan, the utility's distribution rate will be unbundled from the commodity rate. However, the distribution utility may still be providing other services that are bundled in with its monopoly regulated "wires" business. Over time, the Board may reexamine its policies on contestable services. These services are those for which the utilities still retain market power but which new entrants could contest for some of the customer base.

The Board may issue guidelines for rate treatment of contestable services offered by utilities.