



The Treatment of Input Price Inflation in Price Control Reviews

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1. BACKGROUND

An important issue faced by all regulators is the treatment of input price inflation in price control reviews. Where input prices are rising, or becoming more volatile, regulators employ various assumptions and methods in estimating their effects. In the case of regulated entities, increases in costs arising from input price inflation may not be recovered if they were not initially accounted for in the price control. On the other hand, in the event of decreasing input prices, the regulated entity may benefit through lower costs. Therefore, the cost allowances for regulated entities should adequately reflect the potential impact of future changes in input costs.

1.1 Purpose of the Document

The purpose of this document is to examine how input price inflation fits into the regulatory building block-approach and the ways in which the RIC will deal with the issue in price reviews. The paper focuses on those short-term inflation adjustments in the determination of price limits, which are generally set for five years.

1.2 Responding to this Document

All persons wishing to comment on this document are invited to submit their responses by mail, fax or e-mail to:

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Responses will normally be published on the RIC's website unless there are good reasons why they must remain confidential. Requests for confidentiality should be submitted along with the comments. A copy of this document is available from the RIC's website at **www.ric.org.tt**.

2. INTRODUCTION

The Regulated Industries Commission (RIC) Act No. 26 of 1998 establishes the RIC as the economic regulator of the electricity transmission and distribution sector in Trinidad and Tobago. Five years have passed since the RIC released its First Determination of rates and charges for the electricity transmission and distribution sector. As the RIC looks at its second price determination for the electricity provider, the Trinidad and Tobago Electricity Commission (T&TEC), it wishes to examine the effectiveness of its regulatory measures and the relevance of their applicability in the future.

The overarching regulatory approach adopted by the RIC to regulate prices/revenue is an incentive-based approach, commonly referred to as RPI-X approach. In its most general form, the RPI-X approach involves limiting price changes to the general inflation level less a specified “X” factor. The aim of the “X” factor is to reflect the expected change in productivity of the service provider. RPI-X regulation is intended to provide strong incentives for efficiency, as any savings above the predicted rate “X” can be kept by the service provider.

Over time, this simple model has evolved and now takes on a number of different forms. However, two main common approaches have evolved to establish the “X” factor. The first approach relies heavily on Total Factor Productivity. The second approach is known as the “building-block” approach. This is the approach utilized by the RIC. This approach entails assessing the maximum levels of charges which an efficiently operated and financed service provider might be expected to recover from customers over a five-year period, taking into consideration projected operating and maintenance costs (Opex) and projected investment (Capex) in the service provider’s asset base. In contrast to the traditional RPI-X model, the X-factor is simply a profiling factor for charges.

At five year intervals, the RIC sets the amount of revenue that the service provider can collect from customer. This five-year approach is international best practice, and is used by most regulators. It offers the service provider a clear and stable environment to make necessary

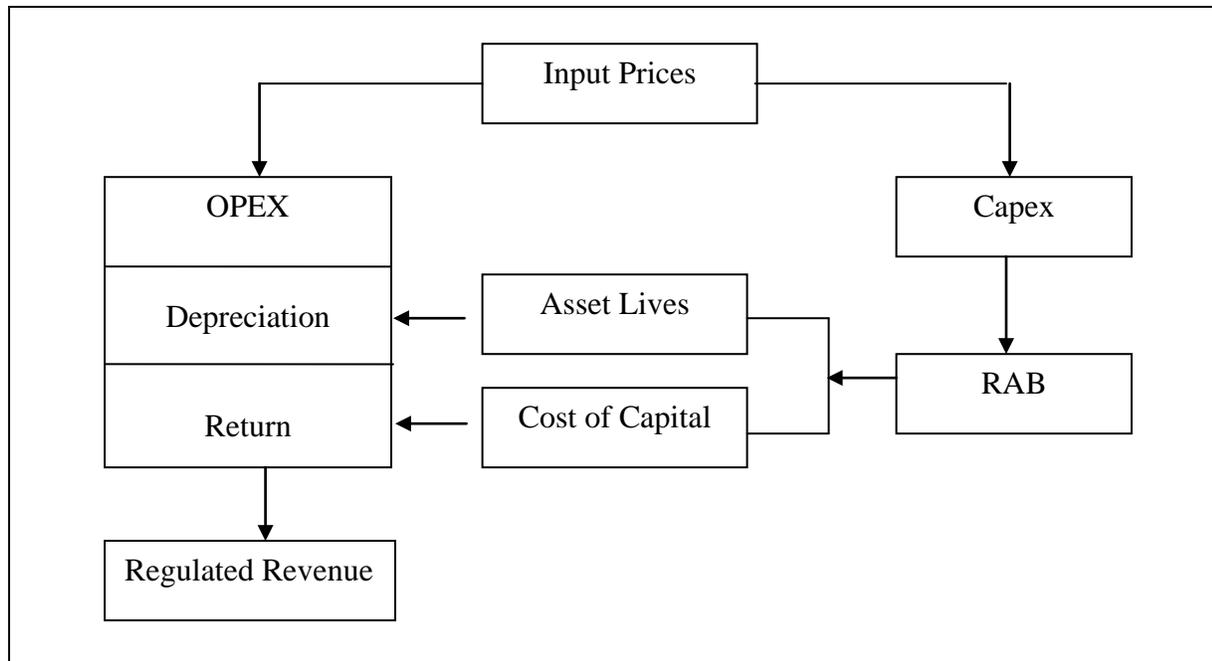
investments. The building-block approach is consistent with the RIC Act, Section 67 (4) which requires the RIC to have regard to, *inter alia*:

- Replacement capital cost expended;
- Least-cost operating expenses which must be incurred;
- Annual depreciation; and
- Return on the rate base.

In the case of regulated entities, increases in costs arising from input price inflation may not be recovered if they were not accounted for in the revenue requirements of the service provider. The input price assumptions made in the revenue requirement are therefore an important element of the regulatory assessment and feed into two key aspects of the RPI-X building-block approach (**Figure 1**):

- Determination of the allowed revenue; and
- efficiency assessment.

Figure 1 – Building-block Approach and Input Prices



3. SETTING REVENUE ALLOWANCES

As indicated above, in a simple RPI-X model base allowable revenue is indexed to take into account price inflation. The index used should be the best reflection of the increases in prices to be faced by the service provider. Also, the index needs to be practical to implement, robust and transparent.

In the determination of allowed revenue, the movement in the overall level of prices is an important consideration, as measures of general inflation are required for a number of purposes. Adjustments for inflation are required to determine the real cost of capital, to adjust the Regulatory Asset Base and other costs and to set the annual escalation factor for price limits during the control period.

As input prices are assessed prior to finalization of price controls for the forthcoming price control period, there will inevitably be an element of uncertainty about the evolution of input prices. There are a number of generic mechanisms that regulators normally employ to take input cost pressures into account. These include:

- allowing for separate “cost items” in the revenue allowance, with specific indicators of input cost trends. This may be practical for a small number of major activities, say, for labour inputs, but may not be so for more general cost elements; and
- building a “weighted” cost index, reflecting different cost pressures across activities and weighting these by the proportion of costs accounted for by each activity.

In addition to these specific approaches to assessing input prices, some regulators have used a “**contingency uplift**” mechanism to capture several factors that affect future costs. This mechanism consists of an “uplift” that reflects increases in prices beyond those forecast by the regulator. For example, British Airports Authority used RPI+2 to reflect increasing construction prices. The contingency uplift can help to mitigate the negative effects of unanticipated price fluctuations and it could also cover other types of risk that a service provider may face during a

price control. A contingency uplift is typically applied to cost allowances and is based on the ability of the regulator to forecast future movements in risk, which include input prices as well as other factors. This approach may also be used in conjunction with other mechanisms.

In practice, increases in labour, energy and raw material costs have been estimated differently by different regulators. For example:

- **taking the futures price**, since this represents what market experts consider to be the price going forward. This approach has been used primarily in forecasting raw materials.
- **taking an indirect approach** – for example, drivers of labour costs may be used for forecasting labour costs, instead of the direct price of labour.
- **econometric techniques** – here input prices may be forecast by using this technique to explain the pattern in prices based on historical data.

As it is often difficult to obtain specific deflators, most regulators traditionally use an exogenous index such as the Consumer Price Index (CPI), or the Retail Price Index (RPI) and to a lesser extent the GDP deflator, as an overall deflator. While no individual inflation measure satisfies all the criteria of an ideal inflation factor, the CPI possesses many of the characteristics that are desired in the index to be used for cost inflation in the rate determination. It is often published by independent government institutions which will eliminate any claims relating to price manipulation as neither the electricity company nor the regulator have any influence or control over the index and therefore cannot subject it to manipulation or significant revisions. It is also noteworthy that the CPI is published at regular intervals, as the availability of an inflation index on a timely and regular basis, is critical for price determination purposes. It is also generally recommended that regulators use a broad-based government published index that is free of interpretation such as the CPI, as a broad based inflation index would reflect changes of a large bundle of goods and services. The general question is whether a consumer focused index is relevant for the electricity sector as the majority of the costs of this sector relates to wages, materials and purchased power/fuel.

Despite limitations, the CPI/RPI remain well recognised and understood measures of inflation for macroeconomic policy management and are widely used for general indexation of public and private sector contracts and charges. While the bundle of domestic products and services used in determining the RPI may not bear a strong resemblance to the inputs of the electricity industry, the RPI provides a useful surrogate for the input price indexes in the absence of an electricity specific cost index in Trinidad and Tobago. In any case, while an industry-specific index has the potential to more accurately reflect the particular costs of an industry, there are important conceptual and measurement difficulties. Additionally, there is a risk that an industry specific index can easily equate to the pass-through of actual costs without sufficient regard to efficiency and productivity considerations.

A number of regulators worldwide have adopted the use of the Consumer Price Index, or some variant, as the index used for cost inflation in rate determinations. The Queensland Competition Authority in Australia used an 8 capital city weighted average all groups CPI to index for cost inflation in its final determination of electricity distribution. Cost variables were adjusted for inflation using the Producer Price Index for utilities under the Performance Based Regulation approach for electricity distribution in Ontario, Canada. In the Uganda Electricity Sector Determination of 2006, cost elements were adjusted in response to inflation, with the local currency denominated element of operating and maintenance expenses indexed to local inflation.

4. RIC'S APPROACH IN DETERMINING THE REVENUE REQUIREMENT

As the majority of T&TEC's revenue as determined by the RIC comes under a few notable or sizeable cost activities, the RIC applied the under-mentioned approach to account for input prices and their increases for the first control period:

- Conversion and fuel costs, which constitute for about 70% of T&TEC's total costs, were treated largely as pass-through items as these are considered non-controllable input costs for T&TEC and are subject to contractual arrangements;

- Labour costs, which accounts for 50% of T&TEC's Transmission and Distribution costs, were escalated by factors used in ongoing wage negotiations in other similar sectors in Trinidad and Tobago;
- For depreciation and the return on capital, the Retail Price Index was used for conversion to real terms. The application of the RPI reflects the changing value of money and it can be argued that a consumer index reflects this best; and
- For the remainder of T&TEC's Transmission and Distribution Costs, the Retail Price Index (specifically the Core Index, which removes the effects of food inflation) was used for indexation.

5. DEALING WITH UNCERTAINTY

Indexation is not the only way in which the regulatory model takes into account the changes in input prices. As indicated above, some costs are treated as pass-through items. The degree of pass-through can vary, and it is usually applied in conjunction with other mechanisms that account for increases in input prices. Regulators not only have to deal with forecasting input price inflation, but also with the errors associated with forecasts of other inputs. Due to unforeseeable events, input prices may exceed the forecast level and, in some cases, the increase may impact on the financeability of the service provider. In this situation, regulators generally apply an additional set of mechanisms to deal with such uncertainty.

Fuel adjustment clauses have been in widespread use, where changes in fuel prices are automatically passed on to consumers through bills.

Another way of dealing with this uncertainty is to allow the service provider to recover additional costs (**ad hoc allowances**) above those assumed in the price control. This mechanism is usually applied in respect to capital expenditure.

Some utilities in the USA were permitted to be reimbursed for inflation fairly rapidly. This technique permits a utility to pass on to the consumer immediately all legitimate costs. If the costs are subsequently disallowed as being unjustified, they must be refunded to customers with 10% interest.

Some regulators have employed the use of **cost drivers**. These are allowances that are built into a regulatory control that adjust as non-controllable elements change. These can be for fairly mundane aspects. Mechanisms for larger items tend to be referred to as **triggers** since they take a zero or one value, effectively a binary choice, where a value is either included or excluded, whereas mechanisms for smaller items tend to be based on a forecast value with the deviation being captured by the mechanism.

Another technique which has been used is the tying of major parts of rate levels to automatic price escalators. The escalators are programmed to grant the routine increases necessitated by inflation.

Finally, the service provider has the option to apply for a **re-opener** (interim determination) in order to mitigate an adverse effect of changing market conditions. The increases in costs here have to be as a result of exogenous shocks.

It must be pointed out that input prices are not always beyond the service provider's control. In the short-term, the service provider may have no control over input prices, but, in the medium-term, the service provider may change its mix of inputs in order to minimize costs incurred, as it may shift to cheaper inputs during a period of rapid price increases. In the longer term, the service provider may be expected to mitigate the adverse impact of rising input prices through capital labour substitution or even contracting out.

6. CONCLUSION

The assessment of the impact of input price inflation requires a degree of judgment, especially when there is no simple agreed upon methodology. The RIC proposes to continue to use its approach, as described in section 4 above.

The RIC would like to receive comments on the above-mentioned proposals. The submissions it receives in relation to this document will play an important role in its eventual decision related to how it treats with input price inflation.