

# Agenda

Advancing economics in business

## Regulatory foresight: input prices and the RPI – X approach

**A contentious issue in utility regulation is the treatment of input price inflation in price control reviews. Input prices have risen and become more volatile for some sectors in recent years, and regulators have employed various assumptions and methods in estimating their effects. How does input price inflation fit into the regulatory building block approach, and what are the ways in which regulators have dealt with the issue?**

Recent price control reviews have highlighted the challenge of input prices. For example, GB gas distribution networks (GDNs) and the industry regulator, Ofgem, put significant effort into determining how input prices would evolve over the next price control period, and found that rising input costs, above the Retail Price Index (RPI), would have an impact of over £200m per annum on the firms' costs.<sup>1</sup>

The impact of input prices on cost may be estimated using the following formula:

$$\text{Costs} = \text{sum of (input prices)} \times (\text{inputs})$$

where input prices are defined as the price per unit of input—eg, the wage rate per unit of labour or the price of 1KWh of electricity.

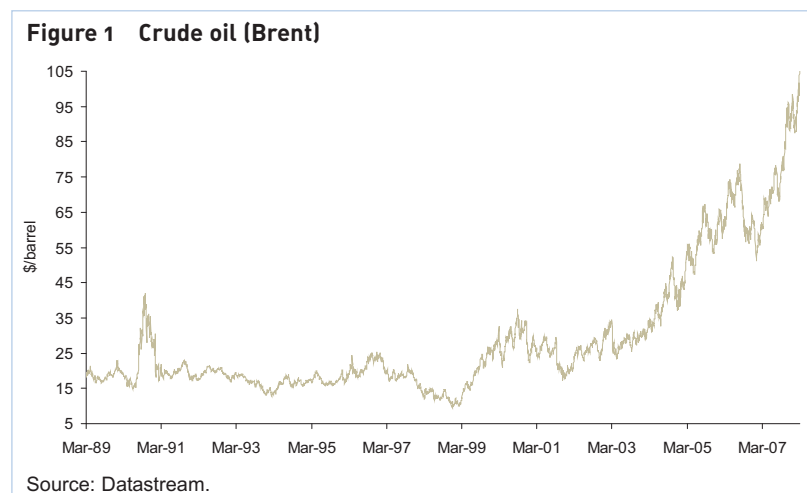
An example of the rising trend of input prices can be seen in Figure 1, which shows that the price of oil has increased by 500% in the past decade. This has

contributed to an increase in the prices of other inputs, impacting regulated companies, which cannot easily pass on the costs to consumers due to price regulation.

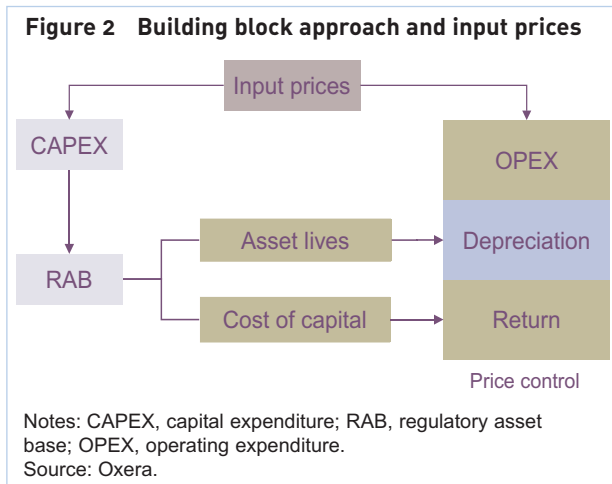
In competitive markets an increase in input prices would tend to be reflected in the price of outputs. Consumers will therefore ultimately pay for any adverse market fluctuations. In the case of regulated companies, increases in costs arising from input price inflation may be not recovered if they were not accounted for in the price control. On the other hand, in the event of *decreasing* input prices, companies may derive higher profits by charging consumers prices that are significantly above their costs.

The input price assumptions made in company business plans are therefore an important element of the regulatory assessment, and feed into two aspects of the RPI – X 'building block' approach (see Figure 2):

- determining allowed revenue;
- efficiency assessment.



Ultimately, the cost allowance for regulated companies should adequately reflect the potential impact of future changes in input costs. It is often assumed that input costs are exogenous to the firm, and determined in a wider market (such as that for particular types of skilled labour). Companies may have some influence over specific input costs (including at least some influence over wage rates), although they may have a greater influence on the quantity and mix of inputs used to produce goods and services.



## Setting reasonable allowances

Input prices are usually assessed by regulators prior to price controls as part of the consultation process. However, there will inevitably be an element of uncertainty about the evolution of input prices in the coming price control period for both regulators and companies.

There are a number of generic mechanisms that regulators could employ to take input cost pressures into account. For example, they could:

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

However, in addition to specific approaches to assessing input prices, some regulators use a contingency uplift mechanism to capture several factors that affect future costs. This mechanism consists of an uplift to allowed costs that reflects increases in prices beyond those forecast by the regulator. The contingency uplift could help to mitigate the negative effects of unanticipated price fluctuations; it could also cover other types of risk that a regulated company 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 risks, which include input prices as well as other factors. The approach may be used in conjunction with other mechanisms.

These approaches differ in terms of materiality thresholds, the degree to which the issue needs to be identified up front in the regulatory review, and the level of cost protection afforded to companies.

In practice, inflation in energy, labour and raw materials costs may be estimated as follows.

- Taking the futures price, since this represents what market experts consider to be the price going forward. This approach is primarily used in forecasting raw materials and energy costs.
- An indirect approach is usually taken when predicting labour costs. Following the methodology employed by the Bank of England and HM Treasury, drivers of labour costs are used for forecasting, instead of the direct price of labour.
- To determine future energy prices, forecast marginal costs of power stations are compared against forecast demand level.
- Finally, all of the above categories of input prices may be forecast by using econometric techniques (eg, reduced form equation models such as ARIMA or GARCH) to explain the pattern in prices based on historical data.

Recent UK price control determinations provide several practical examples of how regulators have taken account of input prices.

- In its 2004 periodic review of water charges for 2005–10, Ofwat assumed that all cost movements will be captured by RPI.<sup>2</sup> The regulator increased the cost allowances as a result of an anticipated 40% rise in power prices. At the same time, it decreased the allowed revenue by 0.5% due to the RPI effect of increasing energy prices.
- In the 2004 electricity distribution price control review, Ofgem did not make any explicit assumptions about input prices, except that they will be captured within RPI.<sup>3</sup> However, it allowed cost pass-through of any deviations from the anticipated level for certain elements such as business rates.
- For the 2007 gas distribution price control review (GDPCR), Ofgem undertook a bottom-up analysis of all input price categories.<sup>4</sup> Historical data was used as a basis for forecasting cost growth for different cost categories. After several iterations, Ofgem explicitly included allowances for three cost categories: contractual labour, direct labour and raw materials. The GDPCR is reviewed in greater detail in the box below.
- In its recent proposals for the price control for BAA’s two London airports (Heathrow and Gatwick), the CAA assumed that the effect of increasing prices for most inputs would be included in RPI movements.<sup>5</sup>

However, BAA's significant capital expenditure programme might be affected by rapidly increasing construction prices. Therefore, a specific allowance for the construction cost was proposed, allowing an increase in construction costs by RPI + 2. The CAA also allowed a 25% cost contingency, reflecting inflation risk.

## Dealing with uncertainty

Regulators not only have to deal with forecasting input price inflation, but also with errors around forecasts of other inputs of the price control. There are several options available to help to determine the degree to which the risk is allocated between company and consumers. The choice depends on the extent to which companies can mitigate the risk.

The outlined approaches to setting allowances do not guarantee that a company will be in a 'safe harbour' during a price control period. Due to unforeseeable events, input prices may exceed the forecast level and, in some cases, the increase may impact on the financeability of the regulated company. In this situation, regulators may apply an additional set of mechanisms to

deal with such uncertainty: cost pass-through, adjustments at the next price control, and interim determinations.

Regulators may mitigate the risk of changing input prices by allowing companies to pass through increases in certain cost categories. The degree of pass-through can vary, and it is usually applied in conjunction with other mechanisms that account for increases in input prices. For example, when pass-through is applied in combination with a contingency uplift, the cost excess beyond the contingency uplift is either full or partial pass-through. Ofgem allows full pass-through of the costs associated with adverse weather conditions in excess of a 2% contingency uplift to base price control revenue.

Another way of dealing with uncertainty is to allow companies to recover additional costs above those assumed in the next price control. Where input prices increase costs significantly, however, there may be a case for an adjustment mechanism to enable companies to recover costs in the period after these costs had been incurred. This mechanism is usually applied in respect to

### Case study: 2007 GDPCR

Ofgem's assessment of the likely impact of input price growth on the GDNs was a topic of debate throughout the price control. In its initial proposals, it forecast the real price growth for a number of GDNs' inputs (contract labour, direct labour and materials), based on forward-looking price indices, such as the UK Office of National Statistics' Annual Survey of Hourly Earnings and HM Treasury forecasts, as well as an examination of historical price movements. The GDNs proposed an alternative methodology, which assumed that it is difficult and unnecessary to separately estimate the impact of input price growth and the scope for future productivity improvements, and that, instead, both effects can be accounted for by examining the price movements of a sub-sample of the RPI. In their view, the RPI already accounts for the productivity improvement in the economy, so the scope for real cost reductions for the GDNs could be derived by looking at the part of the RPI that produces an input mix similar to that used by the GDNs. The average price movement of this sub-sample of the RPI in the 1998–2006 period could be thought to represent the long-term trend in the GDNs' total operating expenditure.

Ofgem did not adopt this approach, considering that not all of the items in the sub-sample of the RPI were appropriate (such as domestic and personal services and entertainment and recreation). It also noted that RPI is a measure of consumer prices, and that it is therefore likely

to capture changes in profits and capital employed, as well as productivity. In addition, Ofgem stated that RPI reflects changes in the price of final products and services, whereas the GDNs provide intermediate services.

The GDNs disputed Ofgem's estimates of real input price growth and updated their alternative methodology. They maintained that Ofgem's estimates of input price inflation did not place sufficient weight on long-term trends in input prices, and suggested a number of alternative estimates. In defending their alternative methodology, the GDNs maintained that changes in profits and capital employed were likely to have minimal impact on the estimates, since profit margins in the period of the analysis were likely to have fallen and, although the GDNs provide intermediate services, they suggested that this does not have a material impact on their findings.

In its final proposals, Ofgem updated its estimates for future input price growth, but retained its methodology. For contracted and direct labour, recent evidence put forward by the Competition Commission as regards the price determination of BAA suggests that real price growth could be greater than Ofgem's previous forecasts. Ofgem therefore increased its estimates by 0.5%. It also acknowledged that the GDNs made a strong case that its previous assumption for real growth in materials underestimated likely growth, and increased its estimates from 1% to 3%.

Sources: Ofgem (2007), 'Gas Distribution Price Control Review: Initial Proposals Document', May; Ofgem (2004), 'Electricity Distribution Price Control Review', Final Proposals, November; and Competition Commission (2007), 'BAA Ltd: A Report on the Economic Regulation of the London Airports Companies (Heathrow Airport Ltd and Gatwick Airport Ltd)', September.

capital expenditure costs, when rising input prices are foreseen to deviate from expected costs.

In other situations regulators have used interim reviews to mitigate an adverse effect of changing market conditions. Interim reviews could be used not only in the case of increased input prices, but also in a much broader context. For example, according to Ofwat, interim determinations may be triggered by an increase in costs of 20% of a company's turnover in circumstances that are beyond prudent management efforts.<sup>6</sup> Such increases in costs are exogenous shocks rather than a source of internal inefficiency.

However, it is not only regulators that are responsible for mitigating the adverse effects of increasing input prices. In the regulatory environment in the UK, companies are provided with incentives to become more efficient. Cost efficiency may be achieved not only by employing better technology, but also by allocating resources in a more efficient way in response to changing input costs.

The assumption that input prices are beyond a company's control may not always be accurate. In the short term, firms may have no control over input prices, while, in the mid-term, companies may change their mix of inputs in order to minimise cost incurred. Therefore, firms may shift to cheaper inputs during periods of rapid

price increases. In the longer term, there are a number of ways in which a company can minimise input costs—for example, contracting out, as contractors may face lower costs due to specialisation and scale effects.

Hence, regulators may expect firms to mitigate the adverse impact of rising input prices through capital/labour substitution.

## Conclusion

The mechanisms employed by regulators may not guarantee mitigation of all possible risks related to input prices. Therefore, companies may sometimes bear a significant risk of being exposed to input price inflation and not being compensated for it. However, in the event of decreasing input prices, they may be over-compensated.

Assessment of the impact of input price inflation requires a degree of judgment, especially when there is no single agreed methodology. Therefore, regulators and companies should work towards deriving a robust estimate of input price inflation. The existing technique of assessing historical data as well as forecasting future prices may facilitate the process. Hence, the more accurate the estimates of input prices, the less uncertainty and risk there is likely to be, which is in the interests of both consumers and companies.

<sup>1</sup> Ofgem (2007), 'Gas Distribution Price Control Review: Initial Proposals Document', May.

<sup>2</sup> Ofwat (2004), 'Future Water and Sewerage Charges 2005–10', Final Determinations, December.

<sup>3</sup> Ofgem (2004), 'Electricity Distribution Price Control Review', Final Proposals, November 28th.

<sup>4</sup> Ofgem (2007), 'Gas Distribution Price Control Review', Final Proposals, December 3rd.

<sup>5</sup> CAA (2008), 'Economic Regulation of Heathrow and Gatwick Airports 2008–2013', CAA decision, March 11th.

<sup>6</sup> This threshold is 10% for Notified Items. Notified Items are 'items not allowed for, in full or at all, in price limits because the uncertainty surrounding them is too great'. Ofwat (2004), *op. cit.*, p. 241.

If you have any questions regarding the issues raised in this article, please contact the editor, Derek Holt: tel +44 (0) 1865 253 000 or email [d\\_holt@oxera.com](mailto:d_holt@oxera.com)

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