IPART New South Wales

Independent Pricing and Regulatory Tribunal

Incentives for cost saving in CPI-X regimes

By Dennis Mahoney, Cato Jorgensen & Thomas Clay

IPART Working Paper
July 2011

ISBN 978-1-921628-97-9 WP%

The views expressed in this paper are those of the authors and should not be regarded as representing the views of the Tribunal.

Eric Groom provided intellectual and supervisory leadership throughout the research and writing of this paper.

Inquiries regarding this paper should be directed to:

Dennis Mahoney	(02) 9290 8494
Cato Jorgensen	(02) 9113 7724
Thomas Clay	(02) 9290 8425

Independent Pricing and Regulatory Tribunal of New South Wales
PO Box Q290, QVB Post Office NSW 1230
Level 8, 1 Market Street, Sydney NSW 2000

T (02) 9290 8400 F (02) 9290 2061

www.ipart.nsw.gov.au

Contents

1 Introduction and Executive Summary

1.1 Background

Certain incentive properties are inherent in the way IPART currently applies the building block approach in CPI-X pricing reviews.

This paper defines the inherent incentives for cost or efficiency savings in the standard CPI-X regime. They arise principally because the regime disconnects prices from cost movements after the price path has been set in relation to forecast costs for the period in question.

This delinking of costs from prices creates an incentive for the regulated firm to cut costs early in a determination period because it retains those cost savings until they are passed through to consumers in lower prices. The delinking also creates a counter-incentive to delay until the start of the next determination period any cost savings that would have been done later in the current determination period.

This paper considers how the counter-incentive, and other undesirable incentives within the CPI-X framework, might be overcome. In particular, we state the problem and then show how 3 regulators – Ofwat and Ofgem in the UK and the AER in Australia – have sought to create mechanisms that reward utilities for making cost savings.

1.2 Key Findings

To preserve the strength of the incentive throughout a determination or control period, both Ofwat and the AER use a carryover mechanism.[1] This mechanism allows utilities to retain, for a period of time at least equal to the length of the control period, the cost-savings that result from improvements in efficiency.[2] In both cases, the regulators in question only apply their carryover mechanisms to operating expenditure (opex) savings.

Although we have been unable to find a formal demonstration of the success of the Ofwat opex carryover mechanism, Ofwat has used it since its 1999 Determination. In 2004 it asserted that:

> …the incentive mechanisms amended in 1999 to reward capital expenditure outperformance and incremental outperformance on operating expenditure have worked well. We therefore propose to build on those systems rather than amend them fundamentally.

---

1 In 2009, Ofwat switched to a menu of choices for capital spending only. The menu, called the Capital Incentive Scheme (CIS), is similar to Ofgem's approach (which is discussed later).

2 Ofwat also uses other efficiency incentive mechanisms to reward the best performing of the 23 private water companies it regulates. These incentives appear to require the existence of a significant number of companies. They are not discussed in this paper.

And again in 2008:

> Our approach to operating expenditure and efficiency has worked well for consumers. It is highly transparent and offers clear incentives for each company to outperform by improving efficiency, all to the benefit of consumers.[3]

By contrast, Ofgem attempts to counter the efficiency disincentives by setting an ex ante incentive rate and making an ex-post adjustment in present value (PV) terms to revenue to ensure that the utility receives a preset percentage of savings.

To explain this as Ofgem applies it, we first treat all expenditure as 'totex' rather than maintaining the distinction between opex and capital expenditures (capex) and then show how Ogfem matches ex-post and ex-ante incentive rates.

A separate but related incentive employed by Ofgem is to offer a menu of choices for the totex path. The menu rewards the utility in 2 ways. First, it is rewarded if it chooses a path that it believes it will actually achieve (that is, it is rewarded for forecasting truthfully) and, second, it is rewarded for making efficiency gains relative to the forecast path.

A disadvantage of the Ofgem approach is its complexity. Further, it does not appear to overcome the counter-incentive to defer efficiency gains that is inherent in the standard CPI-X regime.

This paper is organised as follows:

- Section 2 defines and measures the incentive for cost efficiency in a standard CPI-X regulatory regime.
- Section 3 demonstrates how a diminishing incentive may be overcome by preserving it using an explicit carry-over mechanism.
- Section 4 shows how to equalise the incentive for both opex and capex and how to set and achieve an ex-ante incentive rate.
- Section 5 considers how to incentivise firms to forecast their spending at a level that best reflects their view of their future spending (ie, incentivising them to be honest).
- Section 6 sets out our conclusions and raises issues for discussion.

We would like to acknowledge the helpful feedback we received on an earlier draft of this paper from members of the IPART Tribunal, Mr Eric Groom at IPART, Mr Ian Alexander of CEPA in the UK, from Mr Adrian Kemp from NERA and from Mr Jeff Balchin of PwC.

3 Ofwat, *Managing Director letter MD191*, 25 March 2004 and *Setting price limits for 2010-15: Framework and approach*, March 2008, section 4.4, p 40.

2 CPI-X regulation and its role in IPART

CPI-X regulation involves setting a price-path (price-cap regulation) for a utility, allowing for changes in inflation (the CPI factor) and expected efficiency improvements (the "X" factor[4]). The "X" factor may incorporate other aspects in addition to the expected improvement in efficiency, such as rewards for improvements in output quality, service levels or demand management actions.[5]

Regulators generally aim to set prices/revenues along a path that will generate sufficient revenue to recover the efficient levels of opex and capex, with a reasonable after-tax return on capital. The price path is set for a specified number of years, commonly referred to as the 'regulatory control period' or the 'determination period'.

The traditional approach to CPI-X regulation involves resetting the price path towards the end of the determination period, with the new prices based on forecasts of efficient costs expected to be incurred in the next control period. These costs may differ significantly from those on which the previous price path was based.

IPART has employed this approach in its energy and water pricing determinations and extended it to urban rail and bus fare regulation in its most recent determinations.

In 2009, IPART adopted 'NPV neutrality' as a central characteristic of its water pricing decisions. It therefore sets price paths that ensure that the net present value (NPV) of expected revenues equals the NPV of forecast efficient costs, usually within the current determination period.

The switch to NPV neutrality eliminates any efficiency carryover mechanism that may have been implicit in the glide path approach. However, the incentive offered by the glide path approach was not well defined and therefore may not have been consistent between determinations.

2.1 Cost saving incentive properties in CPI-X regulation

One desirable quality of the standard approach is that it provides an incentive for utilities to make efficiency improvements above and beyond those incorporated in forecast costs. It does this by setting prices based on forecast costs at the time of the determination and so delinking the price path from the course of actual costs.

4 These efficiency improvements are separate from the economy-wide efficiency improvements already reflected in the change in the CPI.

5 CPI-X regulation may also be applied to total required revenue under revenue-cap regulation. For simplicity, only price-cap regulation will be considered in the text. Issues relevant to price-cap regulation apply equally to revenue-cap regulation.

A key determinant of the shape and strength of the incentive created is the time period over which the delinking occurs.

NPV-neutrality in the next control period ensures that prices are reset to fully reflect costs that are expected to be incurred in that control period, including, of course, any past cost savings that flow through to the control period. Thus, the savings are passed on to consumers via lower prices from the start of the next control period.

A less desirable feature of traditional CPI-X regulation is that the incentive for efficiency savings diminishes as the regulatory period proceeds. The size of the incentive depends on 2 things. First, it depends on the absolute value of the NPV of the cost savings. Second, it depends on the proportion of the NPV of the cost savings that are retained by the company as opposed to being passed onto the customers in the form of lower prices.

Under traditional CPI-X regulation, the NPV of the benefits from an improvement made in a particular year will depend on the size of the savings, the time value of money and the number of years left in the control period.[6]

Does this incentive cause changes in behaviour in practice? The Distribution Network Service Providers (DNSPs) in the UK reportedly made the most significant cuts in their real unit opex in the first year of 2 consecutive determinations.[7] Similarly, the DNSPs did least to curtail real unit opex growth in the penultimate year of determinations.

2.1.1 Incentives and counter-incentives to save on opex

To illustrate the size of the incentive in relation to opex, assume that a company can make a one-off permanent opex efficiency gain of $1m a year in a year of its choosing[8]. Further assume that there is a fixed control period of 5 years, after which prices are reset to reflect the new, lower costs, and that the cost of capital is 7%.[9]

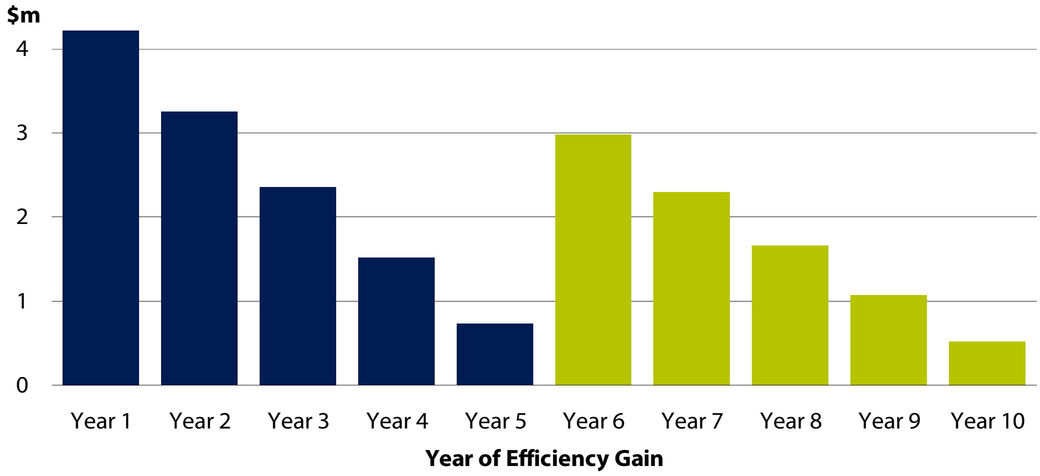
6 The time value of money recognises that a dollar saved today is worth more than that dollar saved tomorrow, ie, the sooner the saving is incurred, the more valuable it is. The change in the value of money over time is represented by the discount rate, which in this case is assumed to be 7%.

7 Burns, Jenkins and Weyman-Jones "Information revelation and incentives" in Crew, Michael and Parker, David (eds) *International Handbook on Economic Regulation* (2006), Figure 8.3.

8 To keep the calculations simple, assume that the opex savings occur at the end of the year.

9 It is reasonable to assume that prices at the start of the next control period are based on (estimated) actual costs at the end of the previous period. If the regulator could improve its cost benchmarking (as Ofgem does with gas networks), another set of costs might be more relevant to price setting, thereby strengthening incentives by increasing the time prices could be delinked from costs.

Figure 2.1 PV of a $1m cost saving in any one year in a standard CPI-X framework



Source: Authors' example. The PV of the cost saving is measured as at the end of Year 0.

Figure 2.1 shows the NPV of the benefits retained by the company from a $1m opex saving ("efficiency gain") made in any one of the years of 2 regulatory control periods, Years 1 to 5 and Years 6 to 10. A $1m permanent saving made in Year 1 is worth $4.1m to the utility in the current control period. If made in Year 2, the $1m is worth $3.2m, and so on.

The value of the gain to the utility diminishes over time, for 2 reasons.

First, the time value of money causes the gain to be smaller in NPV terms the further into the future it occurs. Thus, the gain in the first control period in a particular year in Figure 2.1 is always larger than the gain in the same year in the second control period (eg, Year 1 compared to Year 6, Year 2 compared to Year 7, and so on). This is why there is always an incentive for the utility to make efficiency gains as soon as possible.

Second, the retention period shortens as time passes, expiring altogether at the end of Years 5 and 10.

The shortening of the retention period generates a counter-incentive for the utility to defer efficiency gains. In our arithmetic example, the counter-incentive becomes dominant after Year 2 because the NPV of the gain if made in Years 3, 4 or 5 is less than its NPV if made in Year 6. On the assumptions made, the NPV in Year 3 is only 78% of the NPV of the same gain made in Year 6.

The time value of money determines just when the counter-incentive becomes dominant. For example, if the cost of capital were 14% or above, the company would benefit from making the efficiency gain in Year 3 rather than deferring it until Year 6.

If the cost of capital were 5% or lower, not even the NPV of the gain made in Year 2 would exceed the NPV of the gain made in Year 6.

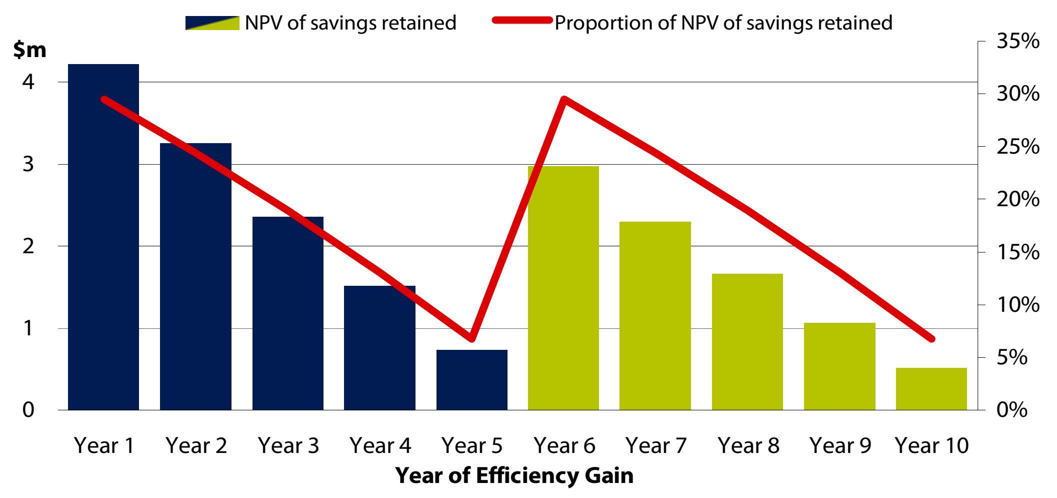
2.1.2 Measuring Incentive Strength or 'the Sharing Factor'

As an aid to analysing the counter-incentive properties in pricing regimes, the incentive strength of a regime can be defined as the proportion of the NPV of efficiency savings that is retained by the company. The efficiency gain that accrues to consumers commences when it is passed on to the consumer via lower prices. The incentive strength can also be called 'the sharing factor'.

In our example, a permanent opex saving of $1m made in Year 1 is worth $14.3m into perpetuity (discounting at 7%). If regulators compelled the company to pass on the gain immediately to consumers in the form of lower prices, none of the gain would be shared with the utility and the incentive strength would be zero. If prices were never lowered in response to the $1m gain the company would retain the gain into perpetuity and the incentive strength would be 100%.

If the company retained the gain for 5 years, the NPV of the gain retained would be $4.1m (or 28.7% of the total gain of $14.3m).[10] Retention for shorter periods reduces the proportion of the gain into perpetuity that is retained by the utility, as shown by the solid line in Figure 2.2 (measured on the right hand scale).[11]

Figure 2.2 Changing proportion of NPV of savings retained in CPI-X framework



10 This is the same arithmetic example as used to derive the first year shown in Figure 2.1, so that the first column of that figure is the same as the $4.1 million mentioned here.

11 Measured in NPV terms as at the end of Year 0, the gain into perpetuity is, of course, worth less the further into the future the gain is made. This does not affect the general point made in the text that a diminishing proportion of the gain is retained by the utility because of the shortening of the retention period.

The $1m gain made in Year 1, retained for 5 years, is worth 28.7% of the NPV of that gain into perpetuity. In Year 2, the gain retained for 4 years is worth 23.7% of the gain into perpetuity. By Year 5 the gain is only retained until the end of that year so that the utility's share of the gain into perpetuity is only 6.5%.[12]

In short, the share of the efficiency gain retained by the company changes each year within a given control period. Thus, the incentive strength of any year within a determination can be measured, but not the incentive strength of the pricing regime as a whole.

2.1.3 Incentive to save on opex greater than incentive to save on capex

Because the recovery of opex and capex is treated differently in the standard CPI-X regime, the incentive for a utility to make savings in opex is greater than the incentive to make savings in capex.[13]

The difference arises because the utility gets the full value of the opex saving from the moment that it occurs until it is taken back (*if* it is taken back) by the regulator at the next reset. But the utility only gets the depreciation and return on capital associated with the capex saving until the regulator takes back the capex saving via a reduction in the RAB at the next reset.

Table 2.1 compares the savings a utility makes from a once-only $100 saving in opex with a $100 capex saving. We assume that both savings are made in the middle of Year 3 and that the cost of capital is 7%.[14]

The first 2 lines show the 2 savings and the present value of the opex saving of $81.63. The remaining lines show why the capex saving of $100 is only worth $21.77 to the utility. The gain to the utility reflects the sum of the present value of the depreciation saved and the return on capital saved. It is these savings which have been built into the price path that rules in the current control period.

Any ongoing opex savings and the adjustment to the RAB required from the capex savings are assumed to be taken back by the regulator at the start of the next control period.[15,16]

---

12 The shares are unaffected by the time value of money so, in comparable years of the 2 control periods, they are the same because they are retained by the utility for the same length of time.

13 It might be thought that the incentives would be the same because the effect on cash flows is the same. But this reasoning ignores the different ways opex and capex are treated, and the utility paid, in a standard CPI-X regime.

14 Of course, if the opex saving were permanent, it would be worth much more to the utility even if it were taken back at the next reset. We assume the once-only opex saving in the table is not taken back in Year 6; if it were it would be worth only $15.00 (in Year 0 dollars) to the utility.

15 It is sometimes alleged that the effect of a permanent saving $100 in opex must be greater than the effect of saving $100 in capex because the former runs into perpetuity whereas the latter only lasts for the life of the asset. We reply: what asset? If the saving on capex means the asset is not needed, could it be that it is not needed into perpetuity as well? What matters is not the duration of the savings but the value retained by the utility before the next reset.

Table 2.1 Present values of $100 once-only saving in opex and $1 saving in capex

	PV in Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Opex saving	$81.63	0	0	100	0	0
Capex saving		0	0	100	0	0
Dep'n on Year 3 capex saving				2.5	5.0	5.0
Reduction in opening RAB					97.5	92.5
Reduction in closing RAB				97.5	92.5	87.5
Return earned on Year 3 saving				3.41	6.65	6.30
Depreciation + return earned on capex saving	$21.77	0.00	0.00	5.91	11.65	11.30

Source: IPART calculations. We have not used the Excel formula for NPV because it assumes observations occur at the end of the year. In this table the savings occur at mid-year.

The different incentives to save on opex and capex may be magnified if the regulated WACC is significantly higher than the utility's actual cost of capital. This occurs because the utility then has an incentive overinvest, and does so (the so-called Averch-Johnson effect). This effect would further distort the relative incentives to save opex and capex and encourage the substitution of capex for opex.

3 Carryover mechanisms

To avoid the counter-incentive to defer efficiency improvements, some regulators, including Ofwat in the UK and the AER in Australia, have added a 'carryover mechanism' to their CPI-X frameworks.

By contrast to Ofwat and the AER, Ofgem has chosen to explicitly fix an ex-ante incentive rate and then to compensate the utility at the end of the control period if the ex-post incentive rate differs from it. It turns out, however, that Ofgem's approach does *not* remove the counter-incentive to defer efficiency improvements.

3.1 Carryover mechanism and its incentive rate

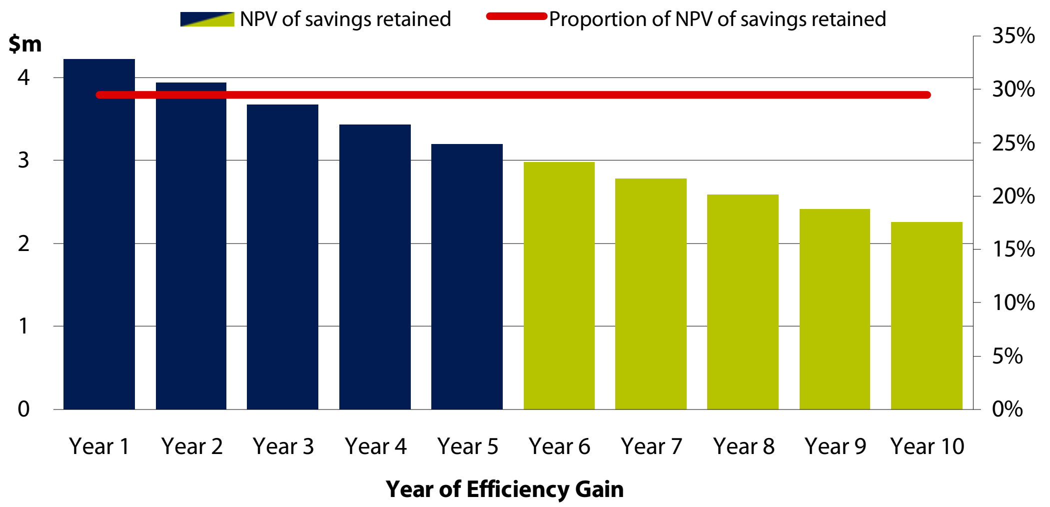
A 'carryover mechanism' allows the company to retain, for a fixed period, the financial benefits from making an efficiency improvement, regardless of when the improvement occurs in the control period.

16 Even if the incentives to save were the same, NERA has pointed out that the utility might still game the regulator by generating a *temporary* saving in opex and then capitalising it in the hope that the regulator will ignore the former but include the latter in the RAB at the reset.

With a 5-year carryover mechanism in the context of a five-year pricing determination, a saving incurred in Year 3 would be retained by the company until Year 8 (Year 3 of the next determination period). Since all savings are retained for the same amount of time, the only difference between a dollar saved in Year 1 and subsequent years is the time value of money. The counter-incentive has been eliminated.

The carryover mechanism therefore ensures that the share of the gain into perpetuity that is retained by the company remains the same regardless of the timing of the initial saving. We can illustrate the effect of a carryover mechanism by grafting one onto the arithmetic example we have been using. A 5-year carryover mechanism for any gain made in any year keeps the share of the total gain retained at 28.7% for every year of the control period (Figure 3.1).

Figure 3.1 NPV of savings retained with a 5-year carryover mechanism



The absolute dollar value of the NPV of retained savings incurred in different years in this regime still falls, because of the effect of the time value of money. But since the *share* of each gain retained by the company remains the same in every year of the control period, the incentive power (or rate) is measurable. It corresponds to the share of benefits retained by the company, and which, in this particular example, is 28.7%.

Apart from the absolute size of the saving itself, one factor dominates the size of the incentive - the length of the retention period in the carryover mechanism. The regulator can adjust the strength of the efficiency incentive, that is, alter the incentive rate, by choosing a longer retention period. In our arithmetic example, increasing the carryover from 5 to 6 years would increase the incentive rate to 33.4%.

The size of the incentive rate may also be different if out-performance and under-performance are not treated symmetrically. But its size does not depend directly either on the length of the determination period or the cost of capital (although the present value of the size of the cost saving does depend on the cost of capital).

We have not attempted to illustrate a carryover mechanism for capex savings. This is more complex and is no longer used by Ofwat and was not adopted by the AER. PwC pointed out to us that the ESC in Victoria has also stopped using one.

4 Equalising incentives and setting an ex-ante incentive rate

We noted earlier that the incentive to save on capex is less than the incentive to save on opex in a standard CPI-X regime. To overcome the different incentive effects Ofgem has combined opex and capex into a single aggregate called 'totex'.

We repeat Ofgem's argument below and consider what it has done in order to treat opex and capex identically in its 2009 Review. Ofgem has pointed out that this treatment and the other 2 mechanisms it employs - setting an ex ante incentive rate and adopting menu regulation – can be implemented separately because they are independent of each other.

4.1 Merging opex and capex into a single 'totex' aggregate

In its *Final Proposals* for the 2009 Review, Ofgem asserts that:

> …the [utility] can currently keep a much higher proportion of underspend against the regulatory operating cost allowance [than it can against its capital cost allowance] …. The same incentive arrangements mean that [the utilities] may invest in high cost "fix and forget" assets that do not require much in the way of maintenance even where there are alternative solutions with lower whole life costs or which bring other benefits. These arrangements also provide [them] with an incentive to reclassify costs from operating expenditure to network investment where the associated incentives are lower. A significant amount of our time in running the annual cost reporting process is spent on policing the boundaries between these categories.[17]

To overcome the distortions it perceives, Ofgem decided to no longer distinguish between opex and capex for the purpose of calculating required revenue. Instead, in the 2009 Review, it treats all expenditure as 'totex' and allocates 85% of it to be recouped from depreciation and a return on capital. Further, it assumes that the average asset life of this 85% of totex is 20 years.

---

17 Ofgem, *Electricity Distribution Price Control Review Final Proposals*, 7 December 2009, para 2.34, p 27. In like manner, in its *Initial Proposals Incentives and Obligations* paper, para 19.1, p 114, Ofgem asserted that "[Utilities] currently bear the full cost of each additional £1 classified as opex but only 29p to 40p for each additional £1 that is capitalised."

> Our methodology is to treat all network investment, network operating costs and closely associated indirect costs in the same way. This means that a fixed proportion of costs across all these activities will be funded through a return on the company's [RAB] and depreciation….
>
> Our decision is that 85% of all costs (other than business support costs) will be capitalised, and that customers will fund [utilities] for this proportion of the [current determination] investments over a 20 year period. This is our estimate of the proportion of costs that would have been funded through this route under the [previous determination] arrangements.[18]

Ofgem considers that the approach reduces the incentive to misreport between opex and capex but, instead of arguing about what is opex and capex, do participants now argue about the proportion of totex to be allocated for immediate recoupment? Despite the name change, Ofgem is still recognising 2 things:

1. that the length of life of the assets on which the totex is expended differs widely, and
2. that a utility ought not to be paid upfront for every dollar of that expenditure.

Ofgem asserts that this procedure effectively converts the RAB into a financial construct relevant to cash flow and delinks it from the balance sheet and asset registers. The RAB becomes a way of sharing costs between current and future customers. It is not apparent whether the 15-85 split is inter-generationally equitable or simply reflects average historical capitalisation.

The 85% returned over the life of the RAB is termed "slow money". The 15% not allocated to the RAB is returned in prices set for the current control period so that it is termed "fast money".[19]

The drawback in this approach is that it jettisons long-standing accounting conventions and disconnects the asset register with all its detail about specific capital items and their estimated (accounting and economic) asset lives from the RAB. Presumably the RAB should now be called something like the Regulatory Slow Money Stock (RSMS) for it is no longer identifiable with certain capital assets. And if it is not, the question of how the remaining "asset" life of the RSMS is determined is an open question. By Ofgem fiat perhaps?[20]

---

18 Ofgem, *Electricity Distribution Price Control Review Final Proposals*, 7 December 2009, pp 28-29.

19 Costs outside the 100% are also returned as fast money.

20 Seems so. "We would decide the range of efficiency incentive rates for companies. There is no exact science to determining "optimal" rates, as evidenced by all regulators adopting similar approaches, and there are a number of issues to consider when determining the appropriate rates. … For simplicity, we talk about factors affecting the appropriate level of the efficiency incentive rate, although in practice we would be deciding on a range (eg, 40 to 50%), with the exact rate for each company determined through the IQI mechanism." Source: Ofgem Regulating energy networks … 26 July 2010, para 10.9, p 99.

In response to an earlier draft of this paper, CEPA advised us that Ofgem has recognised that its fast money/slow money approach breaks the relationship between the RAB and the assets it (formerly) represented. The financability work done for its RPI-X@20 review suggested that the 15/85 split reflected neither the reality of company accounts nor the economic life of the assets involved.[21]

4.2 Fixing an ex-ante incentive rate

Ofgem has 15 incentive mechanisms in its current control for network operators; 6 are related to the environment, 5 related to customers and 4 related to network operations. Here we consider only 1 – that which relates to the incentives for cost saving. The mechanism is called the Information Quality Incentive or IQI for short.

The Ofgem IQI has 3 separate components. First, the distinction between opex and capex is abolished, as discussed above. Second, an ex-ante incentive rate is set. Third, the ex-ante incentive rate is converted to a sliding scale, with suitable income adjustments, to induce utilities to forecast honestly.

Here we deal with the setting of the ex-ante incentive rate. It involves 2 steps.

First, Ofgem decides which categories of cost are inside and which are outside the incentive mechanism. A range of costs are excluded from the equalised incentive but the bulk of costs are included.[22] For the 2009 Review costs excluded were £2.4bn of total expenditure of £13.8bn.[23]

21 Ofgem, *Regulating energy networks for the future: RPI-X@20, Financeability,* 19 May 2010, paras 3.19-3.29. In para 3.29 Ofgem seems to come almost full circle back to an opex-capex distinction, "The [15/85 split] percentage - which could vary by company – would be determined ex-ante and would be based on the amount of *cap-ex* like costs submitted in a company's business plan." [our emphasis]. Also on the Ofgem website see CEPA, *Providing Financeability in a Future Regulatory Framework (a report for Ofgem's RPI-X@20 review)* May 2010, section 6.

22 Some costs, mostly corporate overheads, continue to be treated separately as under the standard CPI-X regime. The utility bears all the risk for cost overruns and retains all the savings until the next reset. Source: Ofgem *Electricity Distribution Price Control Review – Final Proposals - Incentives and Obligations*, 7 December 2009, Table 21.1, p 109. They include business support costs, non-operational capex, discretionary investment, traffic management costs, sole-use connection costs, pensions, worst served customer costs and undergrounding costs. Ofgem, *Electricity Distribution Price Control Review Final Proposals*, 7 December 2009, para 2.41, p 29.

23 Ofgem, *Electricity Distribution Price Control Review Final Proposals – Allowed revenue – Cost assessment,* 7 December 2009, Table 8.3 and Table 8.4, p 104.

Second, Ofgem sets the incentive rate. Initially it was set at 20% to 40% to reflect the same degree of capitalisation of costs that had applied in the previous review. Later Ofgem increased:

> …the incentive strength to range from 30% to 50% which moves the incentive strength much closer to the [previous control period's] weighted average incentive strength on network-related costs. We believe this is appropriate so that there is not such a weakening of incentives on opex and so that capex efficiency is more strongly incentivised during a period of increased investment.[24]

In its *Final Proposals* the rate was set between 30% and 52.5% (as shown later) but the basis for the choice is no clearer than in the paragraph quoted above.[25]

4.2.1 How is the ex-ante incentive rate set?

But what does an incentive rate of, say, 45% mean? One would have expected that an incentive rate of 45% would mean that a utility will retain 45% of the present value of any cost saving it makes where the full value of the gain is its value into perpetuity (a term not used in the Ofgem documents).

This is not the meaning of 'incentive rate' as used by Ofgem because Ofgem's derivation values the cost savings that are to be shared in the first year of the next control period and not into perpetuity.

Ofgem defines the incentive rate in terms of 2 components. The first is expenditure that should be recouped within the control period, that is, fast money. The second is expenditure that should be recouped over many control periods, that is, slow money. We note that in IPART's determinations, in effect, opex is recouped as fast money and capex as slow money.

In Ofgem's IQI mechanism, fast money carries a 100% incentive rate – because any savings in fast money are fully retained by the utility (they are never 'clawed back' in lower prices[26]). When the weighted average incentive rate is a predetermined 45%, slow money therefore, by definition, carries a 35.3% incentive rate.[27]

---

24 Ofgem, *Electricity Distribution Price Control Review Initial Proposals - Incentives and Obligations,* 3 August 2009, p 116.

25 It mentions 13 "issues to consider when setting the efficiency incentive rate" in its *RPI-x@20 Review Implementing Sustainable Network Regulation,* 26 July 2010, p.101. It notes that the importance of each consideration reflects "other aspects of the price control. For instance, the need to provide stronger efficiency incentives through the efficiency incentive rate depends, in part, on the length of the price control period. Similarly, the required allowed return depends, in part, on the uncertainty mechanisms to be included in the price control."

26 How this is to be guaranteed in practice is not obvious since discussions between utility and regulator over pricing in the next control period will presumably rely to some extent on the utility's actual expenditures (that include the effects of the fast money cost saving) incurred in the current control period.

27 That is, 85% x 0.353 + 15% x 1.00 = 0.45. There is a menu of predetermined incentive rates in the IQI mechanism, as discussed shortly.

4.2.2 How is the ex-ante incentive rate achieved?

Ofgem adjusts revenue in the first year of the next control period to ensure that the ex-ante 45% incentive rate applies to the current control period. It calls this adjustment a "true-up". We show how it does this by working through some arithmetic examples.

The simplest case is a once-only saving of $100 in the first year of the current control period. [28] The workings are shown in Table 4.1 with the key assumptions at the top of the table. The key assumptions also apply to Tables 4.2 to 4.4 but are not shown).

Table 4.1 Example #1 of a true-up of ex-ante and ex-post incentive rate

		2010/11	2011/12	2012/13	2013/14	2014/15	PV in 2015/16
1	Allowance	1000	1000	1000	1000	1000	
2	Actual expenditure	900	1000	1000	1000	1000	
3	Cost saving	100	0	0	0	0	**125.76**
4	Saving funded as fast money	15	0	0	0	0	18.86
5	Saving funded as slow money	85	0	0	0	0	106.89
6	Dep'n on the saving (assume 20 yr life)	0.00	4.25	4.25	4.25	4.25	
7	Addition to opening RAB (from the saving)	0.00	85.00	80.75	76.50	72.25	
8	Addition to closing RAB (from the saving)	85.00	80.75	76.50	72.25	68.00	
9	Return earned on saving	1.99	3.89	3.69	3.49	3.29	
10	Dep'n plus return earned on saving	1.99	8.14	7.94	7.74	7.54	
	PV of $1 in 2015/16	*1.258*	*1.201*	*1.147*	*1.096*	*1.047*	
11	**Slow pot gain in 2015/16 dollars**	**2.51**	**9.77**	**9.11**	**8.48**	**7.89**	
12	**Total slow pot gain from saving NPVed to 2015/16**	**37.76**					FM + SM gain to utility
13	**Desired slow pot gain x incentive strength**	**37.72**					56.58
14	**Fast pot adjt to revenues in 2015/16 to achieve target incentive rate**	**-0.04**					45%

Source: Ofgem, *Final proposals – Financial Methodologies*, 7 December 2009, p 19. Small differences due to rounding.

The example makes explicit the $100 saving (lines 1 to 3) and its apportionment between fast and slow money (lines 4 and 5). The utility saves 15% or $15 into the fast money pot and 85% or $85 in the slow money pot.

But the value of the saving to the utility in the slow money pot is not $85. Rather, it is the value of the depreciation and return on capital that is not incurred by the utility but which is still being recovered through the revenue requirement. Calculating the depreciation saved is straightforward. Ofgem assumes that there is no depreciation saved in the first year but after that depreciation is $1/20^{th}$ each year of the reduction in the RAB associated with the saving (line 6).

28 Source: Ofgem *Electricity Distribution Price Control Review Final proposals – Financial Methodologies,* 7 Dec 2009 pp18-19. Table 4.1 attempts to replicate the example Ofgem presents.

The saving causes the actual RAB to be lower than it otherwise would have been but Ofgem expresses this somewhat differently. It expresses the effect of the saving on the RAB in terms of the "addition to the RAB" - the amount the saving would have added to the RAB had it not been made (line 7). Depreciation is then deducted from the opening addition to the RAB to calculate the addition to the closing RAB associated with the saving (line 8).

The return on capital that is saved is the average addition to the RAB associated with the saving multiplied by the WACC.[29] In the first year this is $42.5 multiplied by 4.6%, ie, $1.99. It is higher in subsequent years because the average addition to the RAB associated with the saving is higher (line 9).

Combining both depreciation and the return on capital saved (line 10) gives the value of the saving to the utility in the slow pot. Expressed in 2015/16 dollars, the slow pot gain is a cumulative $37.76 (line 11, explicitly summed in line 12).

What gain should the utility get from the slow pot? In 2015/16 prices, the $85 gain is worth $106.89 (being $85 x 1.258). Given the incentive strength in the slow money pot, the utility should only retain 35.3% of this gain, or $37.72 in 2015/16 dollars.

To ensure that the utility's ex-post gain from the period to 2014/15 equals the ex-ante incentive rate, its allowed expenditure in 2015/16 is reduced by $0.04.

The $15 fast pot gain is already in the utility's 'pocket' as it should be because it is allowed to retain all those savings. In 2015/16 dollars it is worth $18.86. This fast money gain plus the slow money gain adds to $56.58 (box at bottom right of table) which, apart from rounding, is 45% of the total value of the gain of $125.76.

In summary, the utility has received 45% of the gain made from the $100 once-only saving as required by the 45% ex-ante incentive rate. The consumer benefit comes through the RAB in 2015/16 because it is lower by $68. This is the addition to the RAB that would have occurred if the saving had not been made.

4.2.3 Size of gain varies with timing but incentive rate remains unchanged

The example can now be varied to show what happens when we vary the pattern of the savings, specifically when the saving occurs later in the control period. This is important because it demonstrates that the size of the saving is reduced, although the utility retains the same share in that saving.

For example, suppose the once-only saving of $100 had occurred in the third rather than the first year. The calculations are shown in Table 4.2.

29 The simple averaging of the opening and closing additions to the RAB seems inconsistent with the assumption that the cost savings occur at the end of the year (which is the assumption underpinning the fact that the savings in Year 1 do not affect depreciation until Year 2). The average RAB over the year should actually be dominated by its opening value since this does not change until the end of the year. We ignore this complication in what follows.

Table 4.2 Example #2 of a true-up of ex-ante and ex-post incentive rate

		2010/11	2011/12	2012/13	2013/14	2014/15	PV in 2015/16
1	Allowance	1000	1000	1000	1000	1000	
2	Actual expenditure	1000	1000	900	1000	1000	
3	Cost saving	0	0	100	0	0	**114.74**
4	Saving funded as fast money	0	0	15	0	0	17.21
5	Saving funded as slow money	0	0	85	0	0	97.53
6	Dep'n on the saving (assume 20 yr life)	0	0	4.25	4.25	4.25	
7	Addition to opening RAB (for the saving)	0	0	0.00	85.00	80.75	
8	Addition to closing RAB (for the saving)	0	0	85.00	80.75	76.50	
9	Return earned on saving	0	0	1.99	3.89	3.69	
10	Dep'n plus return earned on saving	0	0	6.2	8.1	7.9	
	PV of $1 in 2015/16	*1.258*	*1.201*	*1.147*	*1.096*	*1.047*	
11	**Slow pot gain in 2015/16 dollars**	**0**	**0**	**7.16**	**8.92**	**8.31**	
12	**Total slow pot gain from saving NPVed to 2015/16**	**24.39**					FM + SM gain to utility
13	**Desired slow pot gain x incentive strength**	**34.42**					51.63
14	**Fast pot adjt to revenues in 2015/16 to achieve target incentive rate**	**10.03**					45%

The value of the gain in 2015/16 dollars is lower at $114.74 (compared to $125.76 in Table 4.1) and the utility retains $51.63 of it (compared to retaining $56.58 in the previous case).

The utility's retention of $51.63 in 2015/16 dollars is 45% of the gain. The retention comes via:

- the fast money gain of $15, worth $17.21 in 2015/16 dollars
- some of the 35.3% of the slow money gain of $97.53 as gain in the current period, worth $24.39, and some as a true-up in 2015/16, worth $10.03.

Together the 3 components are $51.63 or 45% of the total gain of $114.74 (box at bottom right of table).

4.2.4 Multiple under- and over-spends and permanent efficiency gains

Examples with multiple under- and over-spends are messy to tabulate because multiple lines are required for depreciation and return on capital that are related to each under- or over-spend. The same is true for permanent cost savings because they affect every year in the analysis.

But a permanent cost saving is worth illustrating because it can then be compared with the arithmetic example we used in sections 2 and 3 for the standard CPI-X regime and the carryover mechanism.

Table 4.3 illustrates how a $100 permanent cost saving in 2010-11 is shared between the utility and the community under the Ofgem assumptions already used.

Table 4.3 Example #3 - True-up with permanent one-off cost saving

		2010/11	2011/12	2012/13	2013/14	2014/15	PV in 2015/16
1	Allowance	1000	1000	1000	1000	1000	
2	Actual expenditure	900	900	900	900	900	
3	Cost saving	100	100	100	100	100	574.91
4	Saving funded as fast money	15	15	15	15	15	86.24
5	Saving funded as slow money	85	85	85	85	85	488.67
	*Dep'n on **FY11** saving*		*4.25*	*4.25*	*4.25*	*4.25*	
	Addition to opening RAB (for FY11 saving)	*0*	*85*	*80.75*	*76.5*	*72.25*	
	Addition to closing RAB (for FY11 saving)	*85*	*80.75*	*76.5*	*72.25*	*68*	
	Return earned on FY11 saving	*1.99*	*3.89*	*3.69*	*3.49*	*3.29*	
	Dep'n on **FY12** saving		0	4.25	4.25	4.25	
	Addition to opening RAB (for FY12 saving)		0	85.00	80.75	76.50	
	Addition to closing RAB (for FY12 saving)		85	80.75	76.50	72.25	
	Return earned on FY12 saving		1.99	3.89	3.69	3.49	
	*Dep'n on **FY13** saving*			*0*	*4.25*	*4.25*	
	Addition to opening RAB (for FY13 saving)			*0*	*85*	*80.75*	
	Addition to closing RAB (for FY13 saving)			*85*	*80.75*	*76.50*	
	Return earned on FY13 saving			*1.99*	*3.89*	*3.69*	
	Dep'n on **FY14** saving				0	4.25	
	Addition to opening RAB (for FY14 saving)				0	85.00	
	Addition to closing RAB (for FY14 saving)				85	80.75	
	Return earned on FY14 saving				1.99	3.89	
	*Dep'n on **FY15** saving*					*0.00*	
	Addition to opening RAB (for FY15 saving)					*0.00*	
	Addition to closing RAB (for FY15 saving)					*85.00*	
	Return earned on FY15 saving					*1.99*	
6	**ALL Depn**	0.00	4.25	8.50	12.75	17.00	
8	**Final add to closing RAB from saving**					382.50	
9	**ALL Return**	1.99	5.88	9.57	13.06	16.34	
10	ALL Dep'n plus return earned on saving	1.99	10.13	18.07	25.81	33.34	
	PV of $1 in 2015/16	*1.258*	*1.201*	*1.147*	*1.096*	*1.047*	
11	**Slow pot gain in 2015/16 dollars**	**2.51**	**12.17**	**20.73**	**28.28**	**34.91**	
12	**Total slow pot gain from saving NPVed to 2015/16**	**98.60**					FM+SM gain to utility
13	**Desired slow pot gain x incentive strength**	**172.47**					258.71
14	**Fast pot adjt to revenues in 2015/16 to achieve target incentive rate**	**73.87**					45%

As in the previous tables, the share retained by the utility is the fast money gain of $86.24 plus the slow money gain of $172.47, which is 45% of the total gain expressed in 2015/16 dollars.

Consumers benefit in the next control period via an opening asset base in 2015/16 that is lower by $382.50 because of the cost saving.

We can re-create the example of section 2 by setting the WACC to 7% (instead of Ofgem's 4.69%) and relabelling the financial years as Year 1, Year 2 etc. Table 4.4 shows the relevant lines of the Ofgem framework without all the detail that lies between lines 5 and 12 in Table 4.3.

Two extra columns have been added at left to shown the value in Year 0 dollars of the savings in the control period and their value into perpetuity. The box at bottom left shows the percentage of the gain into perpetuity retained by the utility. It is 28.7% ($410.02/$1428.57). In short, the Ofgem framework can be adapted to show the same result we have previously derived.

Table 4.4 Calculating the gain retained by utility when WACC = 7%

Year 0									
PV gain to Year 5	**PV to Perpetuity**			**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**PV in Year 6**
		1	Allowance	1000	1000	1000	1000	1000	
		2	Actual expenditure	1000	1000	900	900	900	
$410.02	1428.57	3	Cost saving	100	100	100	100	100	615.33
$61.50	214.29	4	Saving funded as fast money	15	15	15	15	15	92.30
$348.52	1214.29	5	Saving funded as slow money	85	85	85	85	85	523.03
Saving as % of gain into perpetuity		12	Total slow pot gain from saving NPVed to 2015/16	104.79					FM+SM gain to utility
		13	Desired slow pot gain x incentive strength	184.60					276.90
28.7%		14	Fast pot adjt to revenues in 2015/16 to achieve target incentive rate	79.80					45%

Now comes an important result. Let us assume that the saving is not made until, say, Year 3 (Table 4.5). When this happens, the sizes of the gain within the control period and its value into perpetuity fall as expected, as does the utility's share of the gain to perpetuity (all of which always occurs in a standard CPI-X regime). But the utility's share as measured by Ofgem remains at 45%.

This result means that simply setting an ex-ante incentive rate does not overcome the counter-incentive to defer savings that we explored in section 2 and that was overcome by the carryover mechanism in section 3.

However, Ofgem intends to true-up annually in any determinations that commence from 2013 onwards.[30] This change effectively reduces the retention period to a year and removes the counter-incentive altogether. Call this the "future Ofgem approach" to distinguish it from the present approach examined in detail in this paper.

30 See Ofgem *Handbook for implementing the RIIO model,* October 2010, para 10.15 and *Decision on strategy for the next transmission price control - RIIO-T1*, March 2011 paras 5.21ff. Ofgem will investigate whether annual true-ups will require other mechanisms to deal with price volatility.

Table 4.5 Calculating the gain retained by utility when the saving occurs in Year 3

Year 0									
PV gain to Year 5	**PV to Perpetuity**			**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**PV in Year 6**
		1	Allowance	1000	1000	1000	1000	1000	
		2	Actual expenditure	1000	1000	900	900	900	
$229.22	1247.77	3	Cost saving	0	0	100	100	100	343.99
$34.38	187.17	4	Saving funded as fast money	0	0	15	15	15	51.60
$194.84	1060.60	5	Saving funded as slow money	0	0	85	85	85	292.40
Saving as % of gain into perpetuity		12	Total slow pot gain from saving NPVed to 2015/16	42.93					FM+SM gain to utility
		13	Desired slow pot gain x incentive strength	103.20					154.80
18.4%		14	Fast pot adjt to revenues in 2015/16 to achieve target incentive rate	60.27					45%

In summary, although the present Ofgem approach and the carryover mechanisms used by Ofwat and the AER achieve a constant incentive rate, this way of expressing the outcomes is misleading because the 'incentive rate' is defined differently.

For Ofwat and the AER, the incentive rate is the *proportion of the gain into perpetuity* that is retained by the utility. For Ofgem, the incentive rate is the *proportion of the gain expressed in the dollars of the first year of the next control period*.

In the former, under the carryover mechanism, the gain retained by the utility is always the first 5 years of gain so that the share of the gain into perpetuity is the same regardless of the year in which the saving is made.

In the latter, the gain valued in the dollars of the first year of the next control period varies directly with the duration of retention. In short, the present Ofgem approach suffers from the same counter-incentive as the standard CPI-X regime.[31]

As a final observation, it is worth repeating that no mechanism offsets the effect of the time value of money so that there is *always* an incentive for the utility to make the absolute cost savings as early as possible.

31 The counter-incentive is not quite as strong in the Ofgem approach as it is in the standard CPI-X regime because the utility retains the fast money gain to perpetuity. In the arithmetic examples of a permanent fast money saving of $15, the saving after the end of the current control period is worth $152.78 in Year 0 dollars. In a sense, the Ofgem approach effectively places 15% of any totex saving into an unending carryover mechanism.

5 Incentives for honesty in forecasting

In its 2009 review of IPART's approach to incentive-based regulation, CEPA observed that:

> Until recently it appeared that a degree of consensus had emerged that capex was best incentivised through five year rolling incentives, and this approach was increasingly common around the world, although less so in Australia. However, recent years have seen some innovation and developments of this approach, although mainly for privately owned companies, such as Ofgem's use of menu regulation.
>
> Menu regulation seeks to give companies a choice of capex allowances, with higher rewards for companies that more accurately forecast their capex requirements and that make greater efficiency savings.[32]

Menu regulation requires a set of forecasts of costs by the utility and another set of forecasts, called the benchmark, by the regulator. The regulator then sets a menu of expenditure allowances and incentive rates that form the baseline from which the company selects it intended expenditure path. The incentive rate applies to the gap between the baseline and the company's intended expenditure path.

For example, in Figure 5.1, the expenditure allowance is a weighted average of the company's and the regulator's forecast of costs (how the 1/4 weight is derived that applies to the company is not apparent). The incentive rate (already set in the light of the discussion in the previous section) is lower, the higher the forecast of costs made by the company. This is understandable because it is easier to 'beat' a high path on costs than a low one.

Figure 5.1 A simplified Ofgem IQI matrix without additional income

Company forecast of costs	**100**	**120**	**140**	
Benchmark costs	100	100	100	
Relative weight: Company/Regulator	0.25	0.25	0.25	
Expenditure allowance	**100**	**105**	**110**	
Incentive Rate	40%	30%	20%	
Actual				
80	8	7.5	**6** ←	=(110-80)*20%
100	0	1.5	2	
120	-8	-4.5	-2	
140	-16	-10.5	**-6** ←	=(110-140)*20%

Note: all figures are in $m except for those explicitly shown as percentages.
Source: Nick Russ (Ofgem), Presentation to IPART on Cost Incentives, May 2010.

32 CEPA, *Review of IPART's approach to incentive based regulation: a report by CEPA, October 2009, Final report*, p 23. Ofwat proposes to set prices 2010-15 using a similar mechanism that Ofgem used 2005-10. Ofwat calls it the Capital Expenditure Incentive Scheme (CIS) while Ofgem calls it an Information Quality Incentive (IQI). Menu regulation is the generic term.

The incentive rate is applied to the gap between the actual outcome and the allowance. In this case, if a company forecasts that it will spend $140m during the control period but actually only spends $80m, it is entitled to an extra $6m. If however it spends $140m it will be penalised $6m (in PV terms) at the next reset.

The positive feature of the menu is that it gives companies an incentive to choose a lower path for costs than a higher one and to find cost savings against whatever path they choose.

The defect of the incentive scheme in Figure 5.1 is that it does not provide the highest reward to the company for revealing what it honestly thinks it can achieve. For example, if the company thinks it can achieve $100m spend, and it does, what should it reveal to the regulator? As the incentive scheme stands, the company should choose the $140m path because achieving $100m will reward it with a $2m incentive payment as against nothing or $1.5m if it had revealed that it would achieve either $100m or $120m respectively.

To overcome this quirk in the incentive payments matrix, Ofgem applies "additional income" to each choice.[33] The additional income – an extra line in Figure 5.2 – is set in such a way that it changes the incentive matrix to ensure that the largest reward for any given actual outcome is associated with the forecast of that outcome (that is, along the diagonal). If the company now chose the $140m path and achieved $100m it would be *penalised* $1.5m. If it has chosen the path it finally achieved the reward is $2.5m.

Figure 5.2 Ofgem's IQI Matrix with additional income

Company forecast of costs	**100**	**120**	**140**
Benchmark costs	100	100	100
Relative weight: Company/Regulator	0.25	0.25	0.25
Expenditure allowance	**100**	**105**	**110**
Incentive	40%	30%	20%
Additional income	**2.5**	**0**	**-3.5**
Actual			
80	10.5	7.5	2.5
100	**2.5**	1.5	-1.5
120	-5.5	**-4.5**	-5.5
140	-13.5	-10.5	**-9.5**

Source: as for Figure 5.1.

The actual menu determined by Ofgem in its 2009 Review is shown in Figure 5.3 (the columns and rows for 135 and 140 have been deleted for ease of reading).

33 From 2013 Ofgem intends to address this issue in each of its reviews by making the income adjustments through the RAB rather than through cash allowances. See *Decision on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1 Business plans, innovation and efficiency incentives*, March 2011, para 6.3.

Figure 5.3 Ofgem's actual IQI matrix for the 2009 Review

Forecast/ Baseline	**95**	**100**	**105**	**110**	**115**	**120**	**125**	**130**
Incentive rate	0.525	0.500	0.475	0.450	0.425	0.400	0.375	0.350
Allowed expenditure	**98.75**	**100**	**101.25**	**102.5**	**103.75**	**105**	**106.25**	**107.5**
Additional income	3.09	2.5	1.84	1.13	0.34	-0.5	-1.41	-2.38
Actual expenditure								
90	7.68	7.50	7.18	6.76	6.18	5.50	4.68	3.75
95	5.06	5.00	4.81	4.51	4.06	3.50	2.81	2.00
100	2.43	2.50	2.43	2.26	1.93	1.50	0.93	0.24
105	-0.19	0.00	0.06	0.00	-0.19	-0.50	-0.94	-1.51
110	-2.82	-2.50	-2.32	-2.25	-2.32	-2.50	-2.82	-3.26
115	-5.44	-5.00	-4.69	-4.50	-4.44	-4.50	-4.69	-5.01
120	-8.07	-7.50	-7.07	-6.75	-6.57	-6.50	-6.57	-6.76
125	-10.69	-10.00	-9.44	-9.00	-8.69	-8.50	-8.44	-8.51
130	-13.32	-12.50	-11.82	-11.25	-10.82	-10.50	-10.32	-10.26

Source: Ofgem, *Electricity Distribution Price Control Review, Final Proposals, Incentives and Obligations*, 2009, p 111.

Some commentators have argued that Ofgem fails to do 2 things. First, that it fails take into account the uncertain environment in which all regulatory decisions take place and, second, that it fails to consider the risk-averse behaviour of managements that will induce them to overstate their capex plans.

On uncertainty, Ofgem says it will consider 8 mechanisms to deal with it following its RPI-X@20 Review, which we will not discuss here.[34]

On risk aversion, Ofgem notes that it had considered:

> …an alternative [to Figure 5.3] of increasing the incentive strengths more towards the left of the matrix (i.e. a steeper incentive rate) which increases the cost of any risk-aversion in forecasting by the [Distribution Network Operators].

However, it decided not to alter the matrix when reaching its final decisions.[35]

34 These include, among others, Indexation (deals with inflation uncertainty), Volume driver (volume of sales), Revenue trigger (certain events), Use it or lose it (revenue item removed at next control period if not used in this one).

35 Ofgem offered no reasons with this decision in its paper *Final Proposals – Incentives and Obligations*, para 21.7, p 108. In its paper *Electricity Distribution Price Control Review Initial Proposals – Incentives and Obligations*, it dismissed IQI matrices submitted by stakeholders concerned about risk aversion but asserted that "These matrices are not based on formulae and must define the rewards/penalties for every possible outcome manually. They also have variable marginal incentive rates which depend on the degree of any over- or under-spend. In the May consultation we set out our reasons for not pursuing such matrices for DPCR5. We remain of the view that bespoke matrices of this kind are more complex and not as straightforward to implement, and also provide undesirable uncertainty over the incentive rates that apply to any expenditure" para 19.12, p 116.

The Ofgem approach contrasts with the traditional approach in which the regulator, using the utility's forecasts and (usually) an independent consultant's assessment of their efficiency, decides what are the 'right' forecasts of opex and capex to be incorporated into the building block from which prices are derived. Instead, Ofgem uses the traditional approach to derive benchmark costs.

Menu regulation provides the utility with an incentive to choose the level of expenditure it believes it will achieve. The size of incentive might not be optimal if the regulator has set the benchmark at the 'wrong' level (since the gap between benchmark and performance determines the size of the incentive). But, the existence of the incentive does mean that the effects of any wayward benchmarks set by the regulator are likely to be diluted by the menu offered to the utility.

If this is the case, menu regulation appears to have a significant advantage over the traditional approach in that it appears to "share the risk" of adopting inaccurate cost forecasts between the regulator and the utility.

However, such risk-sharing may be more apparent than real. As Mr Jeff Balchin at PwC has pointed out to us:

> Just looking at the simple example and Ofgem's actual matrix, it seems to me that it would be wrong to suggest that the regulator's benchmark held less importance than under the standard Australian practice. In particular, the examples do suggest that, while the businesses may receive the highest payoff if they forecast accurately, the business can only be confident of recovering cost if the regulator's benchmark is close to correct. As an example, in Figure 5.3 if the business truthfully expects to spend 130, then its highest payoff comes from forecasting 130, but that payoff is -10.26.

6 Conclusions

The incentive to defer cost savings in the standard CPI-X regulatory framework may be removed by a carryover mechanism. It cannot be removed simply by imposing an ex-ante incentive rate. Rather, using an ex-ante incentive rate must be done in combination with an annual true-up (sharing of cost savings) that effectively reduces the retention period to a year.

The incentive for a utility to make cost savings as soon as it can always exists because the size of any gain that is to be shared is always worth more the earlier it is made.

Implementing a carryover mechanism or an annual sharing of cost savings and monitoring them seems to involve an increase in complexity, both for the regulator and the regulated. Balancing the positive incentive effects of the mechanism against the negative effects of greater complexity may be something IPART and other regulators may be required to consider in the future.

As for menu regulation, which attempts to induce more honest forecasting through an incentive framework that also rewards cost saving (albeit without overcoming the counter-incentive), CEPA recently concluded that:

> It is too early to make definitive judgements regarding menu regulation. Although initial evidence raises concerns about its likely success, the full implications of its incentives will take time to materialise. We see menu regulation as a good concept in principle that may succeed with time and greater understanding of how best to calibrate the parameters.[36]

---

36 CEPA, *Review of IPART's Approach to Incentive Based Regulation,* October 2009, Final Report, p 30.