



Future price limits — Form of control and regulated/unregulated business

A REPORT PREPARED FOR OFWAT

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Future price limits — Form of control and regulated/unregulated business

Executive Summary		1
1	Introduction	13
2	Background and approach	15
2.1	<i>Context.....</i>	<i>15</i>
2.2	<i>Price control tools.....</i>	<i>16</i>
2.3	<i>Forms of interactions.....</i>	<i>18</i>
2.4	<i>Approach to the appraisal.....</i>	<i>25</i>
3	<i>Ex ante price controls</i>	<i>33</i>
3.1	<i>Key features of ex ante price controls.....</i>	<i>33</i>
3.2	<i>Strengths and weaknesses of ex ante price controls.....</i>	<i>40</i>
3.3	<i>Compatibility with the development of retail and upstream competition.....</i>	<i>43</i>
3.4	<i>Consequences for investment and innovation.....</i>	<i>54</i>
3.5	<i>Summary.....</i>	<i>57</i>
4	Length of control	61
4.1	<i>Examples of price control length.....</i>	<i>61</i>
4.2	<i>Main principles for determining the length of price control.....</i>	<i>62</i>
4.3	<i>Mechanisms to deal with exogenous risk.....</i>	<i>65</i>
4.4	<i>Impact of contestability on the length of the price control.....</i>	<i>66</i>
4.5	<i>Implications of increased investment and innovation for the length of price control.....</i>	<i>70</i>
5	Price control approaches relating to the unregulated activities of incumbents	71
5.1	<i>Rationale for regulatory intervention.....</i>	<i>71</i>
5.2	<i>Dual till vs. single till approaches.....</i>	<i>72</i>
5.3	<i>Principles around the use of single or dual till approaches.....</i>	<i>74</i>

5.4	<i>Supporting mechanisms to deal with cost allocation issues</i>	79
5.5	<i>Appraisal of these approaches</i>	81
6	Price control approaches relating to the unregulated activities of new entrants	83
6.1	<i>Regulation of future commercial interactions</i>	83
6.2	<i>Implications of bilateral contracts and upstream competition</i> ...	84
6.3	<i>Implications of water abstraction trading</i>	87
6.4	<i>Summary and observations</i>	88
7	Pricing rules	89
7.1	<i>Key pricing rules</i>	89
7.2	<i>Strengths and weaknesses of pricing rules</i>	94
7.3	<i>Compatibility with developing retail and upstream competition</i>	95
7.4	<i>Consequences for investment and innovation</i>	101
7.5	<i>Summary</i>	102
8	Other lighter touch approaches	105
8.1	<i>Non-discrimination obligations</i>	105
8.2	<i>Informational remedies and disclosure requirements</i>	107
8.3	<i>Price monitoring</i>	108
8.4	<i>Negotiation and constructive engagement processes</i>	112
8.5	<i>Strengths and weaknesses and lighter touch approaches</i>	115
9	Key choices for adapting the price control	117
9.1	<i>Application of price controls with emerging competition</i>	117
9.2	<i>Approaches for managing additional interactions that may arise with emerging competition</i>	120
9.3	<i>Facilitating competition through a network access price control</i>	121
9.4	<i>Impact of investment and innovation on the suitability of the alternative price control tools</i>	122
9.5	<i>Increased importance of operational interactions</i>	124

Annexe 1: Structure and characteristics of the water value chain	127
Annexe 2: Methods for determining the level of an <i>ex ante</i> control	129
Annexe 3: Level of aggregation of <i>ex ante</i> controls	139
Annexe 4: Complementary mechanisms to an <i>ex ante</i> control	141
Annexe 5: Operational and market codes	143

Future price limits — Form of control and regulated/unregulated business

Figure 1. Price control tools categorised by level and form of competition	18
Figure 2. Possible interactions between businesses	19
Figure 3. Impact of increasing the price control length	63
Figure 4. Implications of increased competition on any decision around the appropriate length of a price control	67
Figure 5. Key segments of the supply chain	127
Figure 6. Building block approach	130
Figure 7. Building block approach with main input parameters	131
Figure 8. Benchmarking options	133
Table 1. Summary of the key characteristics of <i>ex ante</i> price controls	33
Table 2. Selected sample of regulatory regimes using RPI-X	35
Table 3. Allocation of risks	40
Table 4. Selected sample of examples of length of control period	61
Table 5. Alternative regulatory mechanisms	64
Table 6. Mechanisms addressing uncertainties around forecasted costs	65
Table 7. Mechanisms for encouraging prudent capital expenditure	141
Table 8. High level summary of main elements in operational code in Scotland	144

Executive Summary

Challenges facing the water industry include the potential for emerging competition and the uncertain impacts of climate change and population growth. Ofwat is currently considering whether the regulatory regime, and in particular the existing price control, remains fit for purpose in the face of these challenges.

This report seeks to highlight the strengths and weaknesses of alternative price control approaches. This is to assist Ofwat in making informed decisions in the future about whether and how to adapt its current approach to price control.

In general our approach to appraising the various price control tools has involved two steps.

First, we assessed the strength and weaknesses of the price control tools against a broad set of criteria which relate to Ofwat's objectives for the regulatory regime. Given the price control tools are typically designed with a certain level of contestability or market power in mind they share many of the same strengths and weaknesses. We have sought to identify both the common themes and any specific differences that arise from the comparison of different regulatory options.

Second, we expand on these strengths and weaknesses by considering how well these various regulatory tools perform in light of the key challenges facing the industry. In particular we looked at whether the various price control tools promote, or are compatible with, competition developing in segments of the value chain (upstream and retail); and whether they provide incentives or result in consequences for efficient investment and innovation.

In the context of increased contestability we also consider where there might be other implications for the existing *ex ante* price control. In particular we consider the length of the price control and the treatment of the potential unregulated activities, of the incumbent and other entities, that may arise as a result of competition.

In order to assist Ofwat in its future decision making we have drawn our discussion together to highlight the key choices facing Ofwat in relation to whether and how to adapt its current price control approach. This involves discussion of the following.

- The application of price controls with emerging competition — adapting existing *ex ante* controls or using alternative price control approaches.
- Managing interactions (relating to unregulated activities) that may arise with emerging competition.
- Facilitating competition through the access price control.

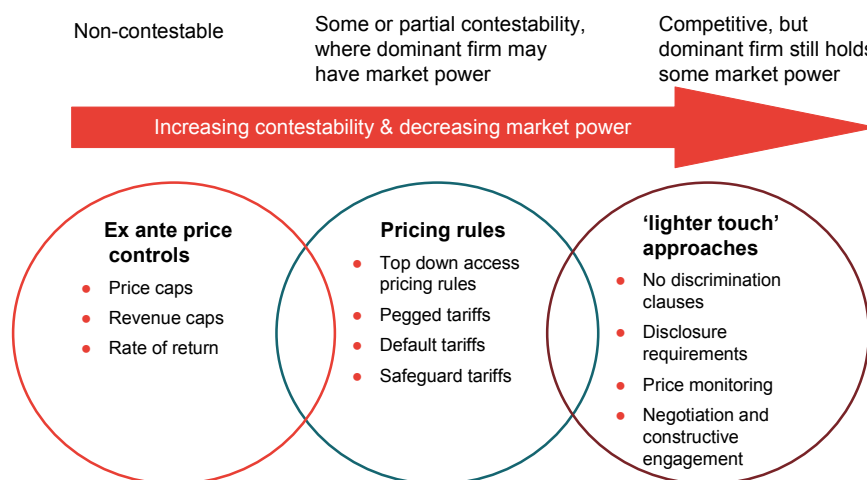
- Future investment and innovation in the sector and how this might affect the appropriateness of the alternative price control tools.
- The increased importance of operational interactions.

Price controls and their key strengths and weaknesses

A decision on whether and how to regulate an entity or market would typically be informed by an analysis of competitive pressure or contestability in the market. As a result price control tools are often designed with a particular context in mind. This has led us to refer to the following categories of price controls on the basis of the context in which they are typically applied (see figure that follows).

- *Ex ante* controls — which presume market failures relating to excessive pricing and take pre-emptive action to prevent these outcomes i.e. price caps, revenue caps and rate of return regulation.
- Pricing rules — which seek to prevent a dominant operator from abusing its dominance i.e. top down access pricing controls and pegged, default and safeguard tariff pricing rules.
- Lighter touch regulatory approaches — that are used for transitional purposes to help foster competition and give the regulator greater certainty in regards to the development of competition.

Price control tools categorised by level and form of competition



Source: Frontier Economics

Ex ante controls

There are various forms of *ex ante* price controls — price caps, revenue caps and rate of return regulation — all of which allow a regulated firm to recover revenue equal to the efficient costs of providing the service. The difference between these relates to the target of the cap:

- Price caps — cap the price of a service or basket of services;
- Revenue caps — cap the total revenues a firm can earn from some or all services; and
- Rate of return regulation— caps the rate of return a firm can make over the regulated period by changing prices in line with changes in costs.

Under the price and revenue cap regimes the regulator must estimate the efficient costs of providing the service for the future regulatory period. There are two main approaches that are used to estimate these costs.

- The ‘building block’ approach — this involves the regulator calculating a revenue requirement. This equals the sum of operating costs and an estimate of both depreciation and a return associated with capital investment for the relevant period. Within this there are two options for the treatment of past investment expenditure:
 - Financial capital maintenance (FCM) sets regulated charges to be sufficient to allow the recovery of all capital invested irrespective of the current value of any asset.
 - Operating capital maintenance (OCM) allows assets to be re-valued to reflect changes in technology, input prices and obsolescence.
- Forward-looking approaches — these focus on the forward looking long run incremental costs (LRIC) of providing the service. LRIC models estimate the costs that an efficient operator would incur to supply a specific increase in demand.

When well developed all these forms of *ex ante* price controls can be effective in addressing excessive pricing concerns as they provide a high level of certainty in terms of the prices of a regulated entity. Also, if applied in a predictable and transparent manner, they provide certainty for a regulated firm in terms of its ability to recover its costs. This encourages investment and security around the ongoing provision of the service. *Ex ante* price controls are also flexible and adaptable. They can be evolved in various ways as circumstances in the sector change and they are compatible with other regulations relating to maintaining the quality of services and protecting standards. At the same time these approaches impose a significant regulatory burden and can encourage strategic behaviour by firms at the time of the periodic review.

However, it is the specifics of an *ex ante* control that drives the relative strengths and weaknesses. For example, the precise way in which regulated revenues are linked to costs defines the efficiency incentives of the regime. A price cap regime can lead to different outcomes compared to a revenue cap – the revenue cap provides stronger incentives to promote customer demand reductions, since these do not lead to a fall in revenue. A rate of return regulatory regime can lead to different outcomes when compared to a price or revenue cap. For example, rate of return regulation can limit the incentive on a regulated firm to become more efficient and encourage the firm to over-invest.

Pricing rules

Pricing rules are typically applied in situations where competition is emerging and where the case for *ex ante* price controls may be reduced. They generally take the form of explicit rules which constrain the pricing conduct of the incumbent. Pricing rules can be alternatives or complements to existing *ex ante* controls.

Pricing rules include:

- top down access price controls — the regulator determines an access price for the service supplied by a vertically integrated incumbent by subtracting from a reference retail price the costs associated with the contestable segment of the supply chain;
- pegged tariffs — the price charged in a non-competitive segment is pegged to a related price in a competitive segment;
- default tariffs — a price limit applied to a specific service in a market which is intended to act as a constraint on other prices in the market; and,
- safeguard tariffs — are set to protect customers against excessive prices. They may be set slightly above the cost reflective level and are not anticipated to bind outcomes in the market.

As well as capping prices some of these mechanisms act as a price floor preventing an incumbent from engaging in predatory pricing.

Although they can involve periodic reviews, they are most typically applied on a one-off basis to fix prices. Therefore, unlike *ex ante* controls they are not always based on the efficient costs of the service. As such they can provide strong incentives for productive efficiency and also have a lower regulatory burden. However, they do not necessarily promote allocative efficiency. Further, they are not particularly adaptable given their fixed nature and so can easily become redundant. Also they may only be applicable in certain specific circumstances as they can rely on the existence and efficiency of the tariff to which they link.

Executive Summary

Lighter touch approaches

Lighter touch regulatory approaches can be applied in more competitive segments of the supply chain to resolve both price and non-price issues that may arise. These are often used in the transition to competition to give the regulator more certainty in regards to the development of competition.

Relevant mechanisms in this category include:

- non discrimination obligations — requires operators not to discriminate in the services they provide or prices they charge to different customers;
- informational remedies and disclosure requirements— requires operators to provide information to consumers to make them more aware of their options and rights; or the regulator in specific circumstance to help highlight when operators may not be complying with other regulatory arrangements;
- price monitoring— requires operator to provide information on price (and service quality) to the regulator as part of a compliance strategy or as a transitional tool when moving towards greater competition; and,
- negotiation and constructive engagement processes — prices (and other non price terms) determined through negotiations between an incumbent and any new entrants with the support of an arbitration process should negotiations fail.

The main strengths of these approaches are that they give companies freedom in conducting their operations and reduce the risk of regulation preventing innovative outcomes or interactions.

However, they may also create uncertainty for incumbents as the rules or processes described are often subject to interpretation. Furthermore, these approaches do not presume misconduct and so have the risk that they will not adequately identify or address any market power concerns.

While the initial regulatory burden of these lighter touch approaches may be lower they often require monitoring arrangements which will impose some administrative burden on both the regulator and the regulated firm.

Key strengths and weakness of the alternative forms of price control

In summary the key strengths and weakness of the alternative forms of price control are presented in the figure below.

Overall strengths and weakness of the alternative forms of price control

	Ex ante price controls	Pricing rules	Lighter touch mech.
Main role of control	Allows the regulated firm to recover revenue equal to the efficient costs incurred	Constrains the pricing of incumbent where competition is emerging	Used mostly for transitional purposes to help foster competition
strengths	<ul style="list-style-type: none"> • High level of certainty in addressing excessive pricing concerns • Adaptable & flexible • Impact on efficiency depends on specifics 	<ul style="list-style-type: none"> • Can prevent both excessive & predatory pricing • Strong incentives for productive efficiency • Low regulatory burden 	<ul style="list-style-type: none"> • Reduced risk that regulation will limit innovative outcomes and interactions • Low regulatory burden
weaknesses	<ul style="list-style-type: none"> • High regulatory burden 	<ul style="list-style-type: none"> • May not lead to allocatively efficient outcomes • Not adaptable • Inflexible — applicable only in certain circumstances 	<ul style="list-style-type: none"> • Some uncertainty for incumbents • Risk that may not address market power concerns

Frontier Economics

Applying and adapting *ex ante* controls with the emergence of competition

Ex ante controls may still have their place in an increasingly competitive environment. However, if **full and effective competition** emerges in the retail or upstream segments of the value chain then *ex ante* controls on these segments will become increasingly unnecessary and ineffective.

With **partial competition**, an *ex ante* control should not significantly hinder the development of efficient retail competition. However, depending on the specifics of the control the incumbent may be protected from competition. This may dampen incentives for the incumbent to improve its efficiency. There are adaptations that can be made to an *ex ante* control to increase the incumbent's exposure to competition.

- Modifying the approach used for determining the level of the control — Adopting a forward look approach to determining costs (i.e. LRIC) increases the regulated firm's exposure to competition and encourages market driven efficiency. However, this could feed through into a higher cost of capital.
- Adopting a dual till approach — this can be used to separate the regulated from the competitive segment. The success of this depends on the ability to separate costs and revenues. Material allocation concerns would argue

Executive Summary

against a dual till approach, as would concern about market power in the unregulated segment.

With ***emerging competition*** the flexibility and adaptability of *ex ante* controls are a major advantage. These controls can be varied or evolved in different ways, to reflect the changing circumstances in the market. The evolution of *ex ante* controls in UK telecoms highlights this advantage. It should be noted that *ex ante* controls do not prevent predatory pricing by an incumbent and therefore other complementary regulatory approaches may be required to manage this risk.

Using alternative price control approaches

With ***partial competition*** pegged tariffs may be useful for linking the price charged in a non-competitive segment of the market to a price in a competitive segment. They are not suitable for controlling retail prices where there is ***effective retail competition***, unless they are intended to achieve a broader objective associated with removing pricing discrimination.

Furthermore, this approach may not be all that effective if used to peg non-contestable household prices to contestable non-household prices, as there is a risk that the operator could choose to increase prices in both markets.

With ***emerging competition*** default and safeguard tariffs may be effective as transitional measures in advance of the de-regulation of an incumbent's retail operations. When used in this way they give the regulator time to observe the efficiency of the market as it emerges.

Lighter handed approaches are relevant to situations where there is a reasonable level of contestability, but concerns around market outcomes remain. Therefore, with increasing contestability their relevance is likely to increase.

Managing interactions that may arise with emerging competition

Forms of interactions

The introduction of competition and the potential for disaggregation of the price control could result in new interactions occurring between different activities using the same assets and businesses operating in different, or within the same segments, of the value-chain.

In the future these interactions may take on a number of forms. The following may be of particular interest to the regulator in the context of price control regulation.

- Possible unintended interactions that arise when the incumbent takes part in any newly contestable sectors, while continuing to undertake regulated activities, such that it may be able to leverage its market power in the non-contestable segment to distort competition. Typically, these will concern either cost allocations or the usage of information.
- Innovative actions by incumbents aimed at generating value through unregulated activities which relate in some way to existing regulated activities. For example they may seek to sell additional products or may find new ways of generating revenue from regulated assets.
- The creation of new contractual relationships between new entrants and incumbents that affect inputs into the price control mechanism.

Relevance to the price control

Unintended interactions can distort market outcomes. For example if the incumbent is able to allocate costs to regulated activities, in order to gain an advantage in the contestable segments of the market, this may distort competition. Price control apparatus could be used to prevent this behaviour.

Similarly innovative activities of the incumbent may also be of interest to the regulator where they:

- involve the use of regulated assets/labour that lead to shared costs between the regulated and unregulated activities of the incumbent; or
- are complements to, or benefit from spillovers arising from, the regulated activity. In these circumstances there may be a rationale for regulated consumers benefiting by sharing in any profits generated through the unregulated activity.

These two forms of interactions (unintended and innovative) both relate to the incumbent's unregulated activities arising from the development of competition.

However, there may also be new interactions that arise in the future, between the regulated incumbent and other unregulated entities, which the price control may need to consider. For example the regulated incumbent may make purchases via some form of wholesale market mechanism which could affect the nature of its costs.

Regulations for managing unregulated activities

There are many different potential interactions that could occur as a result of competition. Depending on the way in which competition is introduced, regulated firms may become counter-parties to contracts with the provider of an

Executive Summary

unregulated service. It is likely the regulator will need to consider how the costs and performance of such contracts will be treated in price controls.

While decisions on the structuring of the contracts will be for future work on the development of competition, it is possible that once contracts are let, future price controls will have little or no influence over them and may need to allow the regulated company to pass through these costs.

Where the regulated undertaking becomes involved in the purchase of tradeable abstraction rights or bulk water trading, it is possible that future price controls may need adaptation to reflect this. Increased volatility of costs makes it more likely that mechanisms to deal with exogenous risks will need to be applied.

Facilitating competition through the network access price

Even with full and effective retail and upstream competition a price control would still be required to control the price set for access to the incumbent's network and its wholesale services. There are two key options available to Ofwat:

- a bottom up *ex ante* price control; or
- a top down retail minus access price control.

In either case a key choice for Ofwat will be whether to be:

- pro-active and define the wholesale or network services provided by the incumbent in order to set all encompassing price controls for these services; or
- reactive and develop price controls that respond to potential retailers or upstream operator's requirements.

Bottom up ex ante controls

As outlined above, a key strength of *ex ante* controls in the context of emerging contestability is their flexibility. These controls can be varied or manipulated in different ways to reflect the circumstances faced. Given they are periodic they can easily be adapted to any changes in the market structure. Also they can take into account of any cost savings made by a regulated firm over time. This means the network access price is more likely to be allocatively efficient.

A weakness of *ex ante* controls is that they cannot be used to prevent predatory pricing by an incumbent in a contestable segment of the market. Therefore, other complementary regulatory approaches (such as pricing rules and lighter handed approaches) may be required to manage this risk.

Top down retail minus access price controls

As an alternative to an *ex ante* control a top down or retail minus access price control can be used.

However, applying this type of control would require the continued existence of a regulated retail price. A retail minus control's effectiveness in promoting efficient competition depends on how the costs, being subtracted from the reference retail price, have been estimated. The complexity associated with doing this is a major weakness of retail minus access price controls. Compounding this are the difficulties associated with adapting these controls over time.

That said there are advantages to retail minus price controls particularly when applied in the context of emerging or partial competition. In particular they may be a more proportionate approach given they impose a lower regulatory burden and administrative costs. This can make them more appropriate when used:

- for transitional purpose (in order that the regulator can wit and see how competition develops) or
- where there is partial competition such that they apply to a small segment of the market.

Retail minus access price controls also reduce the risk of regulatory margin squeeze and enable the regulator to maintain any desirable retail tariff structures or cross subsidies. This means they are compatible with using retail tariff structures to encourage water use efficiency.

Other complementary mechanisms

Additional complementary regulatory arrangements, such as transfer pricing and accounting separation, would be required to accompany any access price control. This is to ensure the incumbent can not shift costs between the upstream and network components of its operations. Otherwise it could use this flexibility to push up the regulated network access price in order to foreclose either the upstream or retail market.

Links between investment and innovation needs and the suitability of alternative price controls

Ex ante controls

When applied in a predictable and transparent manner *ex ante* controls provide a firm with certainty around cost recovery. This lowers the financing risk and the cost of capital. Price or revenue caps based on a building block FCM approaches; or rate of return regulation are the most favourable in encouraging investment, although rate of return regulation may encourage inefficient over-investment.

Executive Summary

However, when there is uncertainty around the future efficient investment needs these approaches may limit the ability to take advantage of future innovations. Ex ante controls based on a building block or FCM approach allow all capital costs incurred to be recovered through the price control. As such investors are not faced with any risks associated with changes in technology or the value of their assets, as they would be in a competitive market. Price controls that de-link the regulated revenue from the firm's actual costs (i.e. LRIC based approaches or pricing rules) will provide greater incentives for innovation and out-performance as any resulting efficiency savings are not necessarily passed straight back to consumers.

In general, innovation can be encouraged by targeting controls at outputs. Yardstick and benchmarking techniques can be used to do this. However, where these techniques involve separate benchmarking of capex and opex this may discourage innovative, co-ordinated solutions. The experience in the energy sector highlights the importance of issues.

Length of the price control

There is no clear link between the length of a price control and the impact on investment and innovation. In practice it will depend heavily on the circumstances in which it is applied.

With an *ex ante* control capital expenditure can be recovered over more than one regulatory period through the regulatory asset base (RAB). This can create uncertainty for the regulated firm when its costs can easily be affected by unforeseen circumstances. The longer the regulatory period the longer the forecasting uncertainty and the greater the risk of unforeseen circumstances affecting its costs over the period. This could feed through to a higher cost of capital and financing costs. Refinements, such as provisions for re-openers or, cost pass-through items, can be made to address this concern.

Conversely a longer term price control would be less risky where the market is more stable (i.e. limited demand volatility) and it is associated with less exogenous risk (or there is a possibility of hedging this). A longer price control in these circumstance would allow the firm to internalise the benefits and costs of any innovation within a single control period. This may encourage dynamic efficiency and therefore innovation and efficiency improvements over time.

Pricing rules and lighter touch approaches

The fixed nature of pricing rules means that they do not take account of any change in costs. Depending on the circumstance in which they are applied this can increase the cost of financing under these controls when compared to *ex ante* controls. That said they may provide strong incentives for innovation given this disconnect between the firm's prices and its costs.

Increased importance of operational interactions

The introduction of competition is also likely to require a number of operational interactions to take place. For example issues with the quality or timelines of information exchanged can impact on the effective and efficient operation of competitive arrangements.

In the event that concerns around these interactions are identified, it is likely that the majority of these will be dealt with by other regulatory processes, for example via regulatory participation in ongoing industry governance processes and the application of some of the lighter touch approaches such as non-discrimination obligations. However, as indicated by precedents in both electricity and gas regulation, there may also be occasions on which issues with such interactions need to be dealt with as part of a price control process.

1 Introduction

There are a number of challenges and changes facing the water industry. These include emerging competition, climate change and population growth. Ofwat is therefore considering whether the existing water and wastewater regulatory regime remains fit for purpose.

Central to this is the way in which Ofwat currently set price limits. In the face of these challenges some adaptation of existing price control may be necessary. The prospect of competition developing in segments of the value chain could change the nature of interactions between regulated and unregulated businesses operating in the sector. This may also lead to changes in the regulatory approach.

This report aims to assist Ofwat by appraising the range of price control tools that can be used by regulators. We consider the strengths and weaknesses of the tools in context of the key challenges facing the water sector. We also assess the ability of the various approaches, within the existing price control regime, to manage any new interactions that may take place between regulated and unregulated businesses.

This report is structure as follows.

- Chapter 2 details the approach we have adopted for appraising the various regulatory tools.
- Chapter 3 considers the strengths and weakness of *ex ante* price control tools in the context of the key challenges facing the industry.
- Chapter 4 gives consideration to the advantages and disadvantages of changing the length of any price control including any unintended consequences that could result from a disaggregated regulatory regime.
- Chapter 5 and 6 consider the different approaches that can be used within the price control for managing interactions between unregulated and regulated activities.
- Chapters 7 and 8 consider the strengths and weakness of alternative pricing rules and light touch regulatory tools that can be used by regulators in a more competitive environment.
- Chapter 9 summaries the key choices, facing the regulator, in terms of adapting the price control in the faces the future challenges facing the industry.

Further details from the evaluation exercise are provided in annexes to the report.

2 Background and approach

In this chapter we provide some background to this report and describe the approach we have taken to appraising the various price control tools. This includes consideration of the following.

- The context to this project, namely why Ofwat is currently considering whether their existing price control regime is fit for purpose.
- The various price control tools that can be used by regulators.
- The forms of interaction that can occur between regulated and unregulated businesses as a consequence of increasing contestability in the sector.
- Our approach to the appraisal.

2.1 Context

There are a number of future challenges facing the water industry that suggest further development of Ofwat's regulatory approach will be necessary. These include:

- competition potentially playing a greater role in the sector; and
- the challenges associated with the changing environment in which the sector operates – climate change; a growing population and changing demographics; greater water scarcity.

These challenges may necessitate adaptation of the price control regime either as part of the next price control in 2014 or into the more distant future.

With the possibility of competition developing in segments of the value chain new interactions will take place between regulated and unregulated businesses operating in the sector. This may lead to unintended consequences and new approaches and principals for regulating these new interactions may be required.

In the future economic regulation may need to increasingly focus on both:

- preventing excessive pricing in the non-contestable segments of the supply chain; and
- the conduct of any dominant operators in the contestable components of the sector, assuming the continued existence of bottleneck distribution network in the supply chain.

This may require some disaggregation of the associated regulatory regime.

2.2 Price control tools

2.2.1 Why control prices?

A price control is a regulatory tool that attempts to limit or control in some way the level and/or structure of prices charged by a firm.

The primary rationale for regulating prices relates to controlling monopoly or market power. In these circumstances firms can charge price above the competitive level by reducing output. Prices above the competitive level can lead to allocative inefficiency and welfare loss.

We note that price controls can have other purposes and objectives. For example they can be used to promote investment, where customers and suppliers may otherwise have difficulties in reaching *ex ante* agreements over future investment. Also price controls are often combined with regulation intended to address broader public policy goals.

Some components of the water and wastewater supply chain (most notably distribution) are always likely to comprise geographic natural monopolies. In which case these components may always be subject to some form of price control.

However, other components of the value chain may be more contestable. However, in these segments the current, vertically integrated incumbent may remain dominant. As a result other forms of price control may still be relevant for constrain the conduct of the dominant firm.

2.2.2 Forms of price control

In this report we have focussed on grouping price control mechanisms on the basis of the primary rationale for their use.

A decision on which segments of the value chain or specific entities should be subject to regulation is typically supported by an analysis of competitive pressure in the market. On this basis the specific regulatory approach adopted would be informed by:

- the degree of, or potential for, contestability in the provision of the service; and
- the degree of market power held by an operator in the market.

At one end of a spectrum of competitive pressure is an operator in a non-contestable market or segment of the supply chain. This monopoly operator could (without regulatory intervention) set excessive prices. *Ex ante price controls* are typically used in this instance. These sector-specific controls presume market failures relating to monopoly pricing and take pre-emptive

Background and approach

action to prevent these outcomes (see chapter 3). These can take many different forms but are all based on the cost of the regulated firm.

At the other end of the spectrum, *ex post* general competition law looks at the conduct of firms in the market. It does not presume misconduct but aims to discourage it through a range of enforcement options including fines and injunctions.

However, where competition is emerging in regulated monopoly sectors transitional issues can arise. These may be such that *ex post* general competition law may be insufficient. This is particularly true in contestable, or potentially contestable segments of the supply chain, where a vertically or horizontally integrated, dominant incumbent may exist that could:

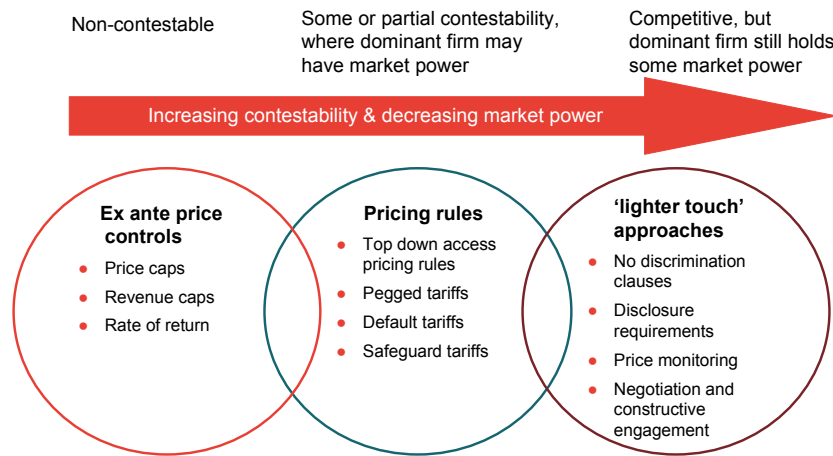
- strategically squeeze the margins of rivals;
- limit rivals access to any bottleneck infrastructure it controls; or
- otherwise leverage its dominance.

In these situations regulators may opt for a level of protection above that provided by competition law, but less comprehensive than *ex ante* price regulation. These can take the form of:

- **explicit pricing rules** which seek to prevent a dominant operator from abusing its dominance (see chapter 7); or
- **'lighter touch' regulations** that are used for transitional purposes to help foster competition and give the regulator greater certainty in regards to the development of competition (see chapter 8).

These can be used as alternatives or complements to any *ex ante* control.

A summary of the various price control tools available to Ofwat categorised on the basis of the context in which they are typically used is presented in **Figure 1**.

Figure 1. Price control tools categorised by level and form of competition

Source: Frontier Economics

2.3 Forms of interactions

In this section we consider the forms of interaction that may take place between regulated and unregulated businesses in order to guide our appraisal of approaches that can be introduced into the price control to manage these.

We first consider the factors that may influence the nature of any future interactions which take place as a consequence of increasing contestability in the sector. This includes:

- interactions arising from disaggregation of the value chain; and
- other features affecting the form of new interactions.

Second, on the basis of these factors, we consider the key forms of interaction that could occur between regulated and unregulated businesses that may be relevant to the operation of future price controls.

For completeness we also highlight the broader regulatory approaches (outside the price control) that could be adopted to manage any regulatory concerns arising from these interactions.

2.3.1 Factors governing the form of future interactions between regulated and unregulated businesses

Interactions arising from the disaggregation of the value chain

It is possible to envisage many potential interactions occurring across the water and sewerage value-chains in future. At a high level the introduction of

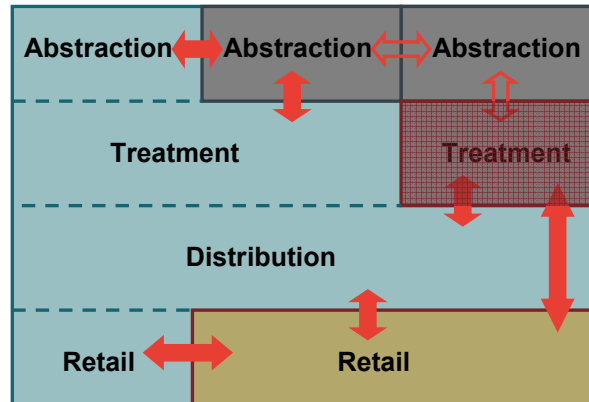
Background and approach

competition and potential price control separation could result in interactions between businesses operating in different segments of the value-chain and between different businesses operating in the same value-chain segments.

Within the current value-chain, it is easy to imagine interactions as progressing from abstraction, through treatment then distribution and finally to retail. However, future interactions could also occur across value-chain segments. For example, a contestable treatment works could interact directly with a retailer rather than just the distribution undertaker.

The high level interactions that can be envisaged for businesses in a less integrated water or wastewater value-chain resulting from increased contestability or price control separation are illustrated in **Figure 2**.

Figure 2. Possible interactions between businesses



Filled arrows represent interactions that could take place between a regulated vertically integrated incumbent and other largely unregulated businesses. Unfilled arrows represent interactions that could take place between largely unregulated businesses, that may be unaffected by a regulated incumbent.

Feature that may affect the form of future interaction

Based on a review of experience from other network based utilities, opened up to competition, a number of broad features can be observed which appear to shape the interactions that may occur in the future.

- **Creation of explicit interfaces between value-chain segments** — Interfaces between contestable and non-contestable sectors may change, and the introduction of price control separation may also require explicit recognition of interfaces or handovers between parts of the same regulated entity. The interactions that subsequently take place can principally be characterised as commercial or operational (see text box 1 below). Commercial interactions involve the sale or purchase of an asset, service or

commodity. Operational interactions could occur over a range of different timescales and typically require an exchange of information.

- **Creation of new contractual relationships** — Depending on the form(s) of competition introduced and in particular on whether there is competition for the market or competition in the market, there may be a range of different contractual relationships between new entrants and incumbents.
- **Innovation** — Incumbent companies may seek to sell additional products to existing customers, or may find new ways of generating revenue from assets held for other purposes (for example leisure services from reservoirs, or the development of a retail property portfolio at rail or air terminals).
- **Unintended interactions** — can arise when the incumbent takes part in any newly contestable sectors, while continuing to undertake regulated activities. Typically, these will concern either cost allocations or the usage of information. If the contestable activities of a regulated undertaking are able to benefit by allocating costs to regulated activities, or by making use of information held by the regulated undertaking, this could distort competition in the contestable sectors. For example this could arise in the allocations of costs between value-chain segments, or within a particular segment when there is partial contestability, e.g, retail competition for only some customers. In these circumstances, price control apparatus may be required to prevent or limit these unintended interactions. This is in order to control monopoly or market power, both in respect of the pricing and non-pricing behaviour of an incumbent.

Box 1 – Commercial vs operational interactions

Commercial interactions involve the sale or purchase of a particular product or service. Hence they may have direct price/cost and quality implications of the sort price controls are used to dealing with.

Operational interactions are enablers or facilitators rather than an end product in their own right, but they play an important role in enabling effective and efficient operations along the value-chain. Possible examples of operational interactions include exchanges of customer or metering information, planning exchanges, provision of information about parts of a network or the exchange of network operational instructions.

Issues with the quality or timeliness of the information exchanged can create additional costs within processes, impact on the ability of unregulated entities to provide services promised to customers or their ability to win additional business. Operational interactions already occur between the different segments of the value-chain, but the great majority of these take place within integrated incumbents. This means that any existing issues impacting on effective and efficient operations may not always be transparent.

2.3.2 Rationale for regulating interactions within the price control

Of the factors described above three may be of particular interest to the regulator in the context of the price control. These are:

- any unintended interactions;
- innovative actions by incumbents; and,
- the creation of new contractual relationships between new entrants and the incumbent that affect inputs into the price control mechanism.

The incentives created by an existing regulatory regime may result in unintended interactions. These interactions can distort the performance within the regulated segment and create distortions within the unregulated and potentially competitive segments. In such cases adjustments to the price control regime are likely to be an appropriate way of managing these concerns.

Perhaps less obviously some types of innovative behaviour by the incumbent may also be of interest to the regulator. For example, where the incumbent undertakes new activities that:

- involve the use of regulated assets or labour that may lead to shared costs between the regulated and unregulated activities of the incumbent; or
- complement, or benefit from spillovers arising from, the regulated activity. In these circumstances there may be a rationale for regulated consumers benefiting from some share in any profits¹ generated through the unregulated activity.

The two forms of interaction (unintended and innovative) both relate to the incumbent's unregulated activities arising from the development of competition.

However, there may also be new interactions that arise in the future, between the regulated incumbent and other unregulated entities, which the price control may need to consider. For example the regulated incumbent may make purchases via some form of wholesale market mechanism which could affect the nature of its costs.

¹ Or at least ensuring that the cost allocation process adequately reflects the value generated by these unregulated activities.

2.3.3 Examples of interactions that could exist between regulated and unregulated businesses and their relevance to the price control

Operational interactions associated with retail competition

In order to allow retail competition to function, a number of operational interactions will be required between the various participants in the market. From a high-level perspective, the operational interactions associated with retail competition typically cover four broad areas:

- tracking which retailer is responsible for which end-customer;
- arrangements for the measurement or imputation of consumption;
- financial settlement arrangements covering the consumed amount; and
- arrangements for the usage, and payment for usage, of the delivery network (where applicable).

Depending on the specific approach (to retail competition) chosen it is possible that responsibility for some of these operational transactions may be placed on a supplier organisation operating under a commercial contract. In these circumstances, the operational transactions may not be of direct interest for the future price control apparatus. However, where responsibility is placed with the incumbent regulated entity, future price controls may need to consider both the effectiveness and costs of the operational interactions.

Cost issues are most likely to arise in respect of the initial set-up of any new market arrangements, particularly if new IT systems or processes are required. The price control apparatus can be relevant both as a means to influence the quantum of costs, and as a possible route through which such costs can be funded.

Sales of additional products

Innovation by incumbent companies could result in several different types of unregulated activity that may be of interest to the price control process:

- sales of additional products to customers of the regulated activities;
- generation of additional revenue from assets or other capabilities required to deliver the regulated activity; and
- diversification into unrelated activities.

Examples of these types of unregulated activities are considered further in Section 5.1.

Background and approach

Interactions associated with upstream competition relating to treatment and disposal assets

Depending on the forms of competition introduced in the upstream value-chain — associated with water treatment and wastewater treatment and disposal services — regulated entities may be either:

- a “provider” of services or information to unregulated entities; or
- a “recipient” of services and information from the unregulated entities.

Where the regulated entity is a **provider**, the major influence on the changes to future interactions is likely to be the distinction between commercial and operational interactions noted in section 2.3.1. Similar approaches to those used in the retail segment of the supply chain will be required to regulate operational interactions around upstream assets. These may include connection codes and balancing and settlement codes. In order to manage commercial interactions:

- a use of systems charging code and the regulation of access charges (see section 3.3.3); or
- a negotiate/arbitrate model for determining access charges may be required (see section 8.4)

Where the regulated entity is a **recipient**, the changes to interactions in the future may pose additional regulatory challenges. If the desired model is for the regulated entity to purchase an asset or service from an unregulated entity, the form and duration of the contractual arrangements may have a significant impact on the future regulatory arrangements. The unregulated entity may favour a long-term contract with a duration covering several price control periods, and may also favour a contract which provides pricing certainty. Potential price control issues arising from these types of interactions are discussed in section 6.2.

While it may still be possible for the regulator to exercise influence over these contracts ahead of signature — for example by requiring rigorous market testing, benchmark comparisons and complex indexation and incentive arrangements — once the contract is signed, the regulated entity may be “locked in” and unable to exercise influence over the future costs.

Interactions associated with abstraction or water trading

If future changes to abstraction regimes were to result in the creation of tradeable abstraction rights or bulk water trading, this may create some specific challenges for future price controls. Drawing on parallels with the UK electricity industry and the regulation of the franchise retail customers during the 1990s, the regulation of the costs arising from bilateral or market trades may need to be different from that for other retail costs. Section 6.3 explores the potential price control implications of this.

Background and approach

It is also possible that the existing incumbents may be dominant in any abstraction rights markets. If this is the case it may justify the use of some sector specific regulation to control for this. Regulatory arrangements covering the water abstraction markets in Australia include water market rules which relate to the conduct of network irrigation operators.

2.3.4 Broader regulatory approaches (outside the price control) for managing interactions

This report focuses on the approaches that can be used as part of a price control to manage future interactions that may take place between regulated and unregulated businesses and, in particular, those identified in section 2.3.2 above.

However, it is important to recognise that the periodic price control is only one of the means by which the regulator may exercise influence. Experience from the de-regulation of the energy market suggests that it may be useful to recognise five broad aspects of regulatory influence.

- **Licence requirements to comply with industry contracts and codes** – for example, in electricity, compliance with the Balancing and Settlement Agreement, and the Grid and Distribution codes is a requirement of the relevant licences. Further details on market and operational codes are contained in Annexe 5.
- **Regulatory influence over initial design of market or contractual arrangements** – there are a spectrum of possibilities ranging from the regulator leading the design process and making specific proposals; the industry leading the design process but with a specific requirement for the regulator to agree to proposed changes; and the regulator being consulted as an arbiter in the event that the participants cannot reach agreement.
- **Regulatory participation in ongoing industry governance processes** – for example, there may be a requirement for the regulator to approve all changes, approve changes or mediate at the request of participants, or the regulator may also be allowed to propose changes.
- **Regulatory oversight of interactions within formal periodic price control processes** – in addition to exercising regulatory influence on the level or structure of charges, benchmark comparisons of performance across companies and any relevant incentive mechanisms, the periodic controls also provide a vehicle to make more fundamental changes such as moving services outside the regulated control or changing the allocations of roles and responsibilities. Given the periodic nature of the price control process, this oversight typically focuses on overall developments rather than individual instances.

Background and approach

- **Regulatory oversight of ongoing industry developments** – where issues arise with individual interactions, matters which impact directly on the service received by customers or the safe and efficient delivery of water and wastewater services, there may be a need for regulatory intervention outside the periodic price control. This could take the form of an annual review. For example, the review of connections in gas and electricity published by Ofgem or as part of the June Return process. Or it may require a more immediate response such as the determination of individual disputes, which may be associated with complaint processes. The number and nature of these interventions is also likely to influence the approach taken during the periodic price control.

The way in which the different approaches may interact will depend to at least some extent on the regulatory framework in the particular industry. For example, in contrast to water, in UK electricity and gas sectors the network price control decisions are enacted via changes to licences. It is also possible that the interactions between the approaches will vary over time. Influences on market design or contractual arrangements are likely to be most active when markets or contracts are first established or subject to periods of significant change.

Participation in governance process or the day-to-day oversight of industry developments can also be very light-touch for significant periods of time. However, there are precedents for issues that had been being progressed via such routes to be introduced into periodic price control reviews as a way to catalyse or accelerate change.

The most recent example of this was the approach followed towards connections in DPCR5 by Ofgem. Ofgem has been seeking to encourage the development of competition in connections via an annual publication of a review of the connections market and associated working groups. However, as a result of limited progress and to avoid further delays, Ofgem introduced a series of new performance standards and governance arrangements for connections as part of the DPCR5 price control package.

2.4 Approach to the appraisal

This report is intended to highlight the key strengths and weaknesses of the alternative price control approaches. This is in order to assist Ofwat in making an informed decision in the future about whether to adapt its current regulatory approach.

For the purpose of undertaking the appraisal we have categorised the various price controls on the basis of the context in which they are typically used (as identified in section 2.2). Namely:

- *ex ante* controls (chapter 3);

- pricing rules (chapter 7); and
- other ‘lighter touch’ regulatory approaches (chapter 8).

We have also considered in further detail the following three aspects that may be affected by the development of competition going forward and which may have implications for the existing *ex ante* price control.

- the length of the price control (chapter 4).
- the treatment of what could be considered an incumbent’s unregulated activities arising from the development of competition (chapter 5); and
- the regulatory treatment of future unregulated activities of other entities arising from the development of competition and impacting on the price control (chapter 6).

In general our approach to appraising the various tools and approaches has involved two steps, which are outlined in future detail in the sections that follow.

- First, we assessed the strength and weaknesses of the price control tools against a broad **set of criteria** which relate to Ofwat’s objectives for the regulatory regime. Given the price control tools are typically designed with a certain level of contestability or market power in mind they often share many of the same strengths and weaknesses. Therefore we have sought to identify both the common themes and also the specific differences that arise from the comparison of different regulatory options.
- Second, we expand on these strengths and weaknesses by considering how well these various regulatory tools perform in light of the **key challenges** facing the industry. In particular we looked at whether the various price control tools:
 - promote efficient competition or at the very least are compatible with, or adaptable to, competition developing in different segments of the value chain (upstream and retail); and
 - provide incentives or pose any consequences for efficient investment and innovation throughout the value chain.

In order to assist Ofwat in its future decision making we have also identified the key choices facing it, in relation to whether it should adapt its current regulatory approach in the future (chapter 9).

2.4.1 Criteria relating to broader objectives for the regulatory regime

In assessing the various regulatory tools we have considered the extent to which they deliver against Ofwat’s broader aims and objectives for the control. While not all the criteria will be relevant in all cases we have used them to help guide

Background and approach

our discussion of the various approaches strengths, weakness, opportunities and threats. These largely relate to the impact of various approaches on risks, incentives and any future market/competition development.

- **Risk or level of certainty with respect to addressing market power concerns** — The mechanism should ensure that companies are not able to charge excessively for services; or price differentiate or predatorily set prices below cost for competitive services. For example in well developed *ex ante* regimes, risk may be relatively lower than in *ex post* regimes, particularly when the basis for ex post investigation and enforcement is left ambiguous.
- **Productive efficiency incentives (minimising costs)** — Driven by the extent to which the firm benefits from any productive efficiency savings. Although we note that in many cases the specific rules in a control govern its incentive properties. The potential for efficiency improvement in the activity will be a relevant consideration.
- **Allocative efficiency (encouraging appropriate service provision)** — A regulatory framework will encourage companies to employ their resources to produce services that provide maximum benefit to society and customers where prices reflect the value society places on the next best alternative use of the resources used. This is important given water and wastewater services forms and input into many other services. To a large extent this is driven by the extent to which prices reflect the full cost of providing the service.
- **Dynamic efficiency and incentives for efficient investment** — Regulatory tools may differ in the extent to which they encourage appropriate investment. These mechanisms may affect investment in different ways. For example:
 - the cost of financing investment can be affected by the regulatory treatment and the risk of asset stranding;
 - the form of price control can affect incentives to deliver the appropriate investment solution, responding to changing market conditions; and
 - the form of price control can also influence decisions on the timing of investment.
- **Scope for innovation** — Some forms of price control may be more supportive of innovative solutions.
- **Promotion of efficient competition** — Regulatory tools may vary in the extent to which they encourage or constrain the development of efficient

competition. This could be through the extent to which they encourage new entry or are compatible with the development of competition.

- **Risk of incentivising inefficient behaviour** — Some forms of price control may encourage firms to engage in strategic behaviour. For example by letting costs rise to get a more favourable outcome for the next review period.
- **Ensuring the ongoing provision of the service** — Many water and wastewater services could be considered essential. Therefore, ensuring that they continue to be provided is an objective of the regulator. Approaches that give greater consideration to the costs of providing the service are more likely to ensure that the regulated firm can continue to profitably provide the service in the face of any exogenous risks and therefore ensure the services on-going provision.
- **Predictability and transparency** — Operators require a sufficient level of certainty over future tariffs and a degree of clarity around what actions will be required, what information is likely to be requested and when it will next be subject to review. This is necessary so that they are able to formulate business plans and plan efficient investment accordingly.
- **Proportionality and regulatory burden** — The cost placed by the current system on participants (Ofwat and operators) will depend on how the regulatory arrangements are set out (i.e. the complexity and level of intervention) and possibly the enforcement arrangements in place.
- **Flexibility and adaptability** — Ability of the regulatory tool to be easily adapted to changes in the sector's structure and level of competition (including in other segments of the value chain), public policy goals or issues arising as a result of climate change. This would include consideration of how the regulatory tool interacts with different forms of control if these were to be applied to different segments of the value chain and the extent to which the regulatory form may act as a barrier to entry. This could be through the pricing structure created or any other incumbent regulatory advantages introduced.
- **Quality and service standard protection** — Consistency of the regulatory tool with ensuring that quality and service standards are maintained (even though they may be directly regulated through separate regulations).
- **Water use efficiency** — Consistency of the price control with ensuring the best use is made of water resources throughout the value chain.

Background and approach

2.4.2 Key challenges and future paths for the industry

In appraising the various price control options we wish to reflect the fact that there is uncertainty about how the sector will evolve in the future.

The strengths and weaknesses of any regulatory tool will be specific to the context in which it is applied. Therefore in order to define whether the controls are compatible with various circumstances we have evaluated them against a small number of different, plausible and relatively simple future paths. The objective is to test the flexibility and consequences of the different forms in a consistent way.

These future paths relate to the key challenges facing the industry. In particular we have looked at whether the various tools:

- Are compatible with competition developing in segments of the value chain. Namely:
 - retail competition; and
 - competition in the upstream segments (resources, treatment and disposal).
- Encourage or lead to any consequences for future investment and innovation in the sector. In particular given:
 - the scale of investment required in the network and upstream segments; and
 - the degree of innovation and complexity of solutions that might be required to meet climate change and sustainability challenges.

All these future paths assume the existence of an incumbent, regulated network operator in the centre of the supply chain.

Annexe 1 contains a description of the various segments of the water and wastewater supply chain that we refer to in this report.

In some cases it is the specifics of the various tools that may make them more or less adaptable to changing industry circumstances. Where applicable we have identified this.

Competition in retail

The extent of competition in the retail segment will have implications for the appropriate form of price control to be applied to this segment. It will also raise issues relating to transactions between regulated and unregulated activities.

The future paths that have been considered in our analysis involve effective retail competition developing for:

- non-household customers only with the household retail segment remaining price regulated; and
- both household and non-household segments.

Competition in upstream segments

The extent of competition in the upstream segments will have implications for the appropriate form of price control, both in the upstream and in the network segments.

The form of competition will impact on the contractual relationships established across the value chain, which will have a significant impact on the suitability of various future regulatory arrangements. For example, if a new water treatment works were built as a result of a “competition for the market”, the incumbent operator may be the contractual counterparty and would seek to recover the costs of this contract via the price control. Alternatively, if there were “competition in the market” for water treatment, the issues arising will be about share of future revenues, potential stranding risks, benchmarking of long-term contracts and so on.

The future paths that have been considered in our analysis involve:

- limited contestability developing in the upstream segments of the supply chain. Models emerge that promote “competition for the market” and contractual relationships between asset operators and other segments in value chain; and
- more effective competition emerging in the upstream segments. This includes competitive trading of abstraction rights (which could extend to a fully functioning wholesale water markets) or discharge property rights and competition between treatment and disposal assets held by an incumbent and a new entrant.

Scale of investment

A large scale investment programme may favour forms of price control that involve relatively low risk and a low cost of finance. The importance of this may vary based on where this investment is occurring within the supply chain and may be associated with the risk of any investment becoming stranded or redundant.

The future paths that have been considered in our analysis involve:

- major investment programmes being focussed in the network segment. In which case benefits of low cost of finance from low risk form of

Background and approach

regulation may outweigh the benefits from more flexible / incentivised forms of regulation; and

- major investment programmes being focussed in upstream segments. This may affect choice between “competition for the market” and “competition in the market”.

Scope for innovation

The changing environment in which the sector operates is likely to drive uncertainty around what investment is appropriate and optimal. Climate change, a growing population, changing demographics, greater water scarcity are all driving uncertainty about future demand and therefore future infrastructure needs. Some forms of price control may better enable flexible and innovative solutions.

The future paths that have been considered in our analysis involve:

- future investment needs and innovation being reasonably predictable. In which case regulator will be aware of optimal solutions; and
- optimal solutions varying from company to company and over time, as innovations are introduced. Solutions may also involve changing patterns of demand-side and supply-side policies and switch of expenditure between upstream, network and retail segments. This favours forms of regulation that support innovative solutions.

3 *Ex ante* price controls

There are various forms of *ex ante* price control that can be used to prevent a firm using its market power to charge excessive prices. These controls work by capping prices, revenues or earnings. All of the forms considered here share a common theme in that they are all based on allowing the regulated firm to recover the efficient costs incurred in providing the service.

Ex ante price controls are typically used for regulating monopolies, or the operations of firms, in monopolistic segments of the value chain (for example, water distribution). These controls anticipate or presume market power and take pre-emptive action to prevent the regulated firm earning monopoly profits.

In this section we first describe the typical forms and other specific elements associated with the application of *ex ante* price controls. We then consider their strengths and weaknesses giving special consideration to their ability to adapt to changing industry circumstances.

3.1 Key features of *ex ante* price controls

The key features of the various forms of *ex ante* price control — price caps², revenue caps and rate of return regulation — are described in this section. At a high level these controls are all based on allowing the regulated firm to recover revenue equal to the efficient costs incurred in providing the service.

The key difference between these controls relates to their target as shown in **Table 1** below.

Table 1. Summary of the key characteristics of *ex ante* price controls

Price control tool	Characteristics
Price cap	Caps the price (with required efficiency saving) of a service or basket of services
Revenue cap	Caps the total revenues a firm can earn from some or all services
Rate of return regulation	Caps the rate of return a firm can make over the regulated period by changing prices in line with changes in its cost base

Source: Frontier Economics

² In principle a price cap does not need to be based on an estimate of the revenue requirements of the firm. However, these alternative forms of price controls are considered separately in chapter 7.

For the various *ex ante* price controls the following specific elements can also vary and affect their relative strengths and weakness:

- the method used for estimating costs (and therefore the level of the control); and
- the approach used for allocating risks.

The alternative approaches adopted in relation to these specific elements are also discussed further in this section.

The length of the control can also have implications for the effectiveness of a price control. This is considered separately in chapter 4.

Further descriptions of the various methods are set out in the Annexes to this report. The methods that can be used for determining the level of the control are set out in Annexe 2. Annexe 3 covers the level of aggregation and Annexe 4 describes other complementary mechanisms that can be used with an *ex ante* control.

3.1.1 RPI-X price caps regimes

RPI-X price cap regulation has emerged as one of the most common regulatory frameworks over the past 30 years. The process for setting the cap is as follows.

- The regulator **estimates the costs** that will need to be incurred by the regulated firm(s) in delivering the services over the forthcoming regulatory period. This will take account of investment requirements and any efficiency improvements that the firm can make.
- The sum of the efficient costs that the regulated firm needs to incur gives the **revenue requirement**.
- The regulator estimates the **volumes** that will be delivered by the firm during the regulatory period.
- Based on the revenue requirement and the forecast volumes, the regulator calculates the profile of prices that recovers this level of revenue.

The modelling of the revenue requirement and price limits is undertaken in real terms, i.e. removing the impact of inflation. The X-factor expresses the percentage change in the price level from one year to the next that is consistent with achieving the revenue requirement. The regulated firm is not permitted to charge prices above the level implied by the X factor.

The profile of price limits is set in advance for the regulatory period. The length of the price control can vary, though five years is typical (see chapter 4).

Ex ante price controls

Therefore, during the regulatory period the regulated price will be adjusted for the previous year's out-turn retail price inflation (RPI³) and the published X-factor in each year.

In most cases the regulated firm delivers more than one product or service. There are a number of ways in which the price cap can be applied to a multi-product firm. For example, the X-factor could apply to each product individually or it could be applied at an average level across the products.

This form of regulation is intended to act as a proxy for competitive market pressure by requiring the regulated company to generate efficiency savings. Typically at the end of the regulatory period any efficiency savings over and above those required by the regulatory control are passed back to customers.

In industries, such as the water industry, with high fixed costs, controlling prices places the risk associated with any under-estimation of demand on the regulated firm. For example if demand falls below forecasts, the firm's revenue will be lower than anticipated, such that it may be less likely to recover its costs. Conversely a firm would increase its revenues by increasing demand.

RPI-X is used widely across various utility sectors and in the water sector both in the UK and overseas. **Table 2** shows just of sample of countries and sectors where it has been applied.

Table 2. Selected sample of regulatory regimes using RPI-X

Country	Sector(s)
UK	<ul style="list-style-type: none"> □ Electricity and gas transmission and distribution □ Water and sewerage □ Post □ Rail □ Airports □ Telecommunications
US	Energy (New York State, Mississippi)
Australia	<ul style="list-style-type: none"> □ Electricity □ Water and sewage □ Airports (until 2002)
Ireland	Gas networks
France	Gas networks
New Zealand	<ul style="list-style-type: none"> □ Gas distribution and metering services □ Telecommunications

Source: CEPA (2009) "The use of RPI-X by other network industry regulators" report prepared for Ofgem.
 Note: This table includes RPI-X regimes that are applied as either prices or revenue caps.

³ RPI is a UK specific measure of inflation. A more generic term is CPI-X.

3.1.2 Revenue cap regimes

A revenue cap is one of the main alternative *ex ante* regimes to a price cap. However, the most important point to note is the strong degree of similarity between an RPI-X price cap and a revenue cap regime. Under a revenue cap regime the regulator will follow all of the steps outlined in the previous section. In other words the regulator will calculate the revenue requirement and then a profile of regulated prices based on a projection of volumes. The regulator may even present the outcome of a revenue cap in terms of price limits (i.e. the X-factors) rather than revenue limits.

The difference between a price cap and revenue cap regime lies in the factors that result in adjustments to prices. As in a price cap regime there will typically be an adjustment to take account of out-turn inflation as well as the calculated X-factor. However, in addition there will be an adjustment to take account of the variation in out-turn volumes compared to projected volumes.

This difference allows a firm under a revenue cap to recover a specified level of revenues, irrespective of volume changes. This removes the revenue risk for the firm associated with unanticipated changes in volumes.

The choice of a revenue cap regime does not mean that the regulator could not set some constraints on the levels of individual prices for services. Issues around the scope and aggregation of the price control are further discussed in Annexe 3.

As part of the 2009 Periodic Review, Ofwat decided to move the regulatory regime to a revenue cap regime. This will be applied as a correction factor at the start of the next price control period.

There are other examples of revenue cap regimes in operation. Revenue cap regimes are applied in energy markets particularly in electricity and gas transmission. In these sectors costs are largely independent of the volumes transmitted. As a result, the revenue cap is an appropriate mechanism to manage the risks faced by these network industries.

3.1.3 Rate of return regimes

Cost-plus regimes

Rate of return regulatory regimes, also known as ‘cost-plus’ regimes, allow the regulated firm to recover operating and maintenance costs and to earn a specified rate of return on the asset base.

Rate of return regulation has been applied to utility networks in many jurisdictions in the USA and too many public sector network firms in Europe.

The strengths and weaknesses of these regimes will, in practice, depend on the specifics of the rate of return regulation applied.

Ex ante price controls

Two main factors are the time lag in the price setting process and the degree of oversight over costs incurred.

- **Time lag for rate setting** — In some cases the regulated firm can apply for a change in regulated prices when costs or volumes change. However, any time lag in this process will increase risk and incentives for the firm. In other cases prices are adjusted automatically on an annual basis.
- **Oversight of opex or capex** — Rate of return regulation will not necessarily encourage efficient investment. Rather, it may encourage ‘gold plating’. Therefore, regulators may apply a review before allowing costs to be recovered. For example, the so-called ‘used and useful’ tests are applied to capital expenditure to ensure that customers do not pay for unnecessary investment.

Earning sharing regimes

Earning sharing regimes are an extension of rate of return regulation. These approaches allow the operator to keep only a portion of the earnings it receives in excess of (and in some cases below) a given level. The remainder must go back to customers, through future price reductions, refunds, or increased investment in facilities or services.

These mechanisms have stronger productive efficiency incentive properties than straight rate of return regimes, though potentially weaker than a formal price cap regime. These approaches do not satisfy the principle of allocative efficiency as well as the rate of return regulation, since price levels can depart from the underlying cost levels.

Regulators in the US have used earning sharing controls. For example earnings sharing mechanisms were used to regulate intra-state telecommunications revenues in New Jersey and California in the 1990s; whilst the Federal Communications Commission gave Regional Bell Operating Companies the choice between a number of hybrid price cap and earning sharing mechanisms in the 1990s.

3.1.4 Methods for determining the level of the control

Under the price and revenue cap regimes outlined above the regulator must estimate the efficient costs of providing the service for future regulatory period, in order to calculate the revenue requirement. There are two main approaches that are often used to estimate these costs:

- the ‘building block’ approach; and
- forward-looking long run incremental cost approaches.

Ex ante price controls

The method used has a strong effect on the relative strengths and weakness of the various *ex ante* controls. Discussion of these approaches follows.

Building block approach

Under the building block approach the regulator calculates the revenue requirement based on an assessment of, the services and quantities to be provided, and of the individual cost components. The individual cost components are:

- operating costs (opex) – often separated into opex associated with existing services and opex associated with new services;
- depreciation charge – this is the regulator’s view on the capital consumption in the period; and,
- return on capital – this is the regulator’s estimate of the return that investors require, multiplied by the Regulatory Asset Base (RAB).

Within this approach there are two options for the estimating the asset base — financial capital maintenance (FCM) and operating capital maintenance (OCM) approaches. The practical difference between the two approaches lies in treatment of past investment expenditure. Under FCM regulated charges are set to be sufficient to allow the recovery of the capital invested. In other words there is no scope for assets to be stranded from the RAB. Once an investment has been accepted into the RAB, it remains there until it is fully depreciated.

In contrast under OCM the value of existing assets in the RAB can be re-valued to reflect changes in technology, input prices and asset obsolescence. Under OCM an efficient firm may earn more or less than the fair return, depending on changes in asset values.

A competitive market would require that firms recover the efficient costs of providing the service. Therefore, within a building block approach there are various benchmarking techniques that are used to estimate ‘efficient’ costs in order to better mimic competitive forces. This can be through considering the past performance of the regulated firm or the costs of one or a number of comparator companies.

These two approaches and other features associated with determining the level of the revenue requirement are described in detail in Annexe 2.

Forward looking costs

An alternative approach to setting the level of the control is to focus on the forward looking long run incremental costs (LRIC) of providing the service.

LRIC models attempt to estimate the costs that an efficient operator would incur if using a hypothetical, efficient network, to supply a forecast of demand for the

Ex ante price controls

service. There are numerous methods for estimating LRIC but they revolve around modelling the operating and capital costs associated with a hypothetical network/operator supplying an incremental increase in demand for the service. A price is then calculated that recovers these costs.

The approaches to the calculation of LRIC based charges can vary according the following factors:

- the scale of the increment assumed;
- the extent to which the modelled network is optimised from its current arrangements; and
- the extent to which any fixed or common costs associated with the services can be recovered through a mark-up on the LRIC calculation.

LRIC based approaches to determining regulated charges are used mainly in the telecoms sector. When determining regulated charges the UK telecoms regulator Ofcom focuses on forward-looking LRIC (FL-LRIC) estimates. Ofcom's requirement that costs are efficiently incurred on a forward looking basis can be interpreted as: what are the costs that would be incurred by a new operator entering the market today?⁴.

The main differences between the building block and LRIC approaches are as follows.

- By setting prices based on forward looking incremental costs the LRIC approach replicates closely the expected outcome from a competitive market. This approach would promote allocative efficiency.
- Under a LRIC approach costs are based on a hypothetical network rather than the actual network, and on incremental rather than total costs. This raises the risk that regulated prices will not reflect the actual costs being incurred by the network. This could feed through into a higher investor perception of risk and a higher cost of capital.

⁴ This approach is consistent with the European Commission recommendation on the treatment of fixed and mobile termination. The Commission recommends that termination rates should be based on the costs incurred by an efficient operator calculated on a bottom-up long run incremental cost (LRIC) basis which ignores legacy costs. The Commission writes that: *"In a competitive environment, operators would compete on the basis of current costs and would not be compensated for costs which have been incurred through inefficiencies. Historic cost figures therefore need to be adjusted into current cost figures to reflect the costs of an efficient operator employing modern technology. Operators which are compensated for actual costs incurred for termination have few incentives to increase efficiency."* (Source: "Commission recommendation of 7 May 2009 on the regulatory treatment of fixed and mobile termination rates in the EU", 2009/396/EC, Official Journal of the European Union, 20 May 2009)

- LRIC approaches imply that historic capital expenditure can be stranded and not recovered from regulatory charges. This may be part of the higher risk profile but can be an advantage in sectors which are exposed to increasing competition.

3.1.5 Allocation of risks and the impact on incentives

A major difference between the various control mechanisms is in how they allocate the risks associated with any areas of uncertainty. All the control mechanisms forecast the costs of providing the service and the future demand for the service. Who bears the risk of a deviation from these forecasts varies across the control mechanisms (see **Table 3**).

Table 3. Allocation of risks

	Demand forecast	Cost forecast
Price caps	Firm	Firm
Revenue caps	Customers	Firm
Cost plus	Customers	Customers
Earning sharing	Shared	Shared

Source: Frontier Economics

The allocation of these risks affects incentive properties of the control mechanisms.

Where the regulated firm bears the risk of variations in demand, as is the case for price cap controls, it has an incentive to increase demand to maximise revenue. In some circumstances this may raise concerns, for example where there is an aim to encourage water efficiency.

Where the regulated firm bears the risk of variations in its cost from that forecast it will have a greater incentive to reduce costs. This is true of both price and revenue caps and rate of return regulation with earning sharing provisions.

3.2 Strengths and weaknesses of *ex ante* price controls

At a high level the *ex ante* price controls described above are all based on allowing the regulated firm to recover revenue equal to the efficient costs incurred in providing the service. As a result they share a number of strengths and weaknesses.

Ex ante price controls

- **High level of certainty for the regulator** — When well developed they provide a high level of certainty for the regulator in terms of addressing excessive pricing concerns as they pre-empt this market failure.
- **Incentivise investment** — Assuming the regulator's behaviour is predictable and transparent they provide certainty for a regulated firm in terms of its ability to recover its costs. This may encourage the firm to invest in ongoing provision. Although the extent of this and whether or not this investment is efficient will depend on the specifics of the control.
- **Ensure on-going provision of the service** — Through their direct consideration of the costs of providing the service they are more likely, (when compared to pricing rules) to ensure that the regulated firm can continue to provide the service in the face of any exogenous risks and therefore ensure the service's on-going provision.
- **High regulatory burden** — In practice, the application of various *ex ante* price controls can be complex and involve significant analysis on the part of both the regulator and regulated firm.
- **Encourage strategic behaviour** — Multi period *ex ante* controls can lead to strategic behaviour by firms at the time of the periodic review. This may be associated with over-investment, distortions to the timing of efficiency savings or possible biases in business planning projections.
- **Compatibility with quality and service standard protection** — Simple forms of *ex ante* price controls may provide insufficient incentives with respect to the quality of service, as a result of the incentives on the firm to reduce costs. In practice however *ex ante* controls, such as that currently applied by Ofwat, are successfully combined with other regulation relating to maintaining the quality of services and protecting standards.
- **Flexibility and adaptability** — *Ex ante* price controls can be manipulated in order to get trade-offs right for the circumstances faced. Any adaptation need not occur in one go rather it could take place over a number of review periods. In addition *ex ante* controls can be complemented, and progressively replaced, by other lighter handed regulatory tools as competition develops (see section 3.3.1 for further discussion of this).

The specifics of the control may also have an influence on their relative strengths and weaknesses. For example it is the extent to which the firms regulated

revenues are ultimately linked to its costs that will define the efficiency incentives of the regime⁵.

A price cap regime can lead to different outcomes when compared to a revenue cap. The various trade-offs involved in making a choice between these controls are set out below.

- **Risk allocation** — Revenue caps are often advocated where there are prospects for significant, uncertain changes in the demand for the regulated services and/or where there are significant fixed and common costs. In these cases a price cap regime could result in significant profit volatility for the regulated firm. This would be likely to lead to a higher cost of capital for the firm. Under a revenue cap, the regulated price would adjust in response to a change in demand. Essentially this places the risk of any deviation from the demand forecast on customers, and would result in a lower cost of capital. If the costs of providing the service are largely variable costs then the revenue cap may lead to higher risk to the firm.
- **Impact on incentives including for water efficiency** — Many drivers of changing volumes will be outside of the control of the firm and therefore the choice between revenue cap and price cap would not affect incentives. However, for drivers where this is not the case a revenue cap provides stronger incentives for the firm to promote customer demand reductions since this will not lead to a reduction in revenue. This can be a benefit in the context of attempts to encourage water conservation. A revenue cap also reduces incentives for companies to understate projected volumes during the regulatory review.
- **Price stability and transparency** — A revenue cap regime may increase the volatility of prices faced by customers. This volatility may discourage complementary investment by customers. It may also reduce the transparency of the regulated price by creating a gap between the published price limits and the out-turn regulated price.

Similarly, a rate of return regulatory regime can lead to different outcomes when compared to a price or revenue cap regime as set out below.

- **Lower incentives for productive efficiency** — Rate of return regulation limits the incentive for a regulated firm to become more efficient, as any cost savings are immediately passed on to consumers. A rate of return regime

⁵ With multi-period price and revenue caps reductions in costs do not feed immediately into lower regulated prices. Although there is always a possible risk that the incentives to cut costs may come at the expense of reductions in service quality.

Ex ante price controls

may also encourage the firm to over-invest in the asset since there may be insufficient regulatory constraints on the amount of investment⁶.

- **Encourage allocative efficiency** — By ensuring that prices are consistently set at the cost reflective level, the principle of allocative efficiency is satisfied.
- **Encourage investment** — A rate of return regime may have a lower risk profile since cost or volume shocks can be passed through to customers with a shorter time lag. This lower risk profile may feed through into lower financing costs (through a lower cost of capital). That said it will not necessarily encourage efficient levels of investment.

We further consider whether or not the various *ex ante* controls:

- **promote or are compatible with efficient competition** developing in different segments of the value chain; and
- provide **incentives for efficient investment and scope for innovation**.

In doing this we refer to the future paths for the sector outlined in section 2.4.2.

3.3 Compatibility with the development of retail and upstream competition

In considering whether the various *ex ante* controls are compatible with the development of efficient retail and upstream competition we have looked at the implications arising from their use in a variety of scenarios (based on the future paths described in section 2.4.2).

First, we have considered the implications of maintaining an *ex ante* retail price control in the presence of full and partial retail competition; and how adaptable *ex ante* controls are to emerging retail competition (see section 3.3.1).

Second, we have considered the implications of maintaining an *ex ante* price control that covers incumbents' upstream operations where there is a full and effective wholesale market or partial upstream competition (see section 3.3.2).

Finally, we have considered whether *ex ante* controls have a role in setting access prices in order to prevent incumbents limiting rivals access to any bottleneck infrastructure it controls or wholesale services it provides (see section 3.3.3). We have also considered the complementary mechanisms that would be required to support this (see section 3.3.4).

⁶ This is referred to as the Averch-Johnson effect.

3.3.1 Maintaining a retail price control in the presence of retail competition

With full and effective retail competition

With full and effective retail competition for both household and non-households *ex ante* price controls covering the incumbent's retail operations would be unnecessary and ineffective. Effective competition should lead to prices reflecting the efficient costs of providing the service. In which case the rationale for regulating retail prices would no longer be relevant. Any control that remained in place would be unlikely to bind and so would impose an unnecessary regulatory burden.

In this context an *ex ante* control, covering the competitive retailing activities of the incumbent, would not be compatible with promoting efficient retail competition. The regulatory burden created would not apply to all competitors and so may bias any market outcomes.

With partial non-household retail competition

If effective retail competition is permitted for non-household customers only, an *ex ante* control on household retail prices could be maintained. These customers would not be able to switch away from the incumbent. Therefore, an *ex ante* control could prevent excessive prices in this non-contestable segment.

It's worth noting that maintaining an *ex ante* retail price or revenue cap (assuming a single till approach) on household prices would provide the incumbent with some protection from competition in the contestable non-household segment of the market. For example, assume that market forces drive prices down in the contestable segment of the market. If prices were to fall below the incumbent's costs, due to the presence of a more efficient provider, this may result in the incumbent being unable to recover sufficient revenue from this contestable service. An *ex ante* control which enabled the incumbent to recover revenue to ensure the ongoing provision of retail services (both household and non-household), would need to allow household retail prices to rise to compensate for this effect.

Therefore, with a price or revenue cap of this form, customers who are unable to switch may bear any increase in price resulting from the incumbent losing market share and revenue in the competitive segments on the market.

Where an incumbent is protected from competitive market forces by the price control, this may also decrease its incentives to improve efficiency in the contestable segment, when compared to the strictly competitive outcome. However, at the same time, it may also decrease any incentive to deter new entry.

Ex ante price controls

There are various mechanisms that can be used within an *ex ante* control to increase a regulated firm's exposure to market forces in order to drive greater efficiency. These mechanisms include:

- adopting a dual till approach;
- modifying the approach used for determining the revenue requirement or level of the control (for example moving to a LRIC); and
- specifying the control as a price cap (as apposed to a revenue cap).

These options come with their own set of strengths and weaknesses.

The dual till approach is further discussed in chapter 5. The impact of the various approaches used for determining the level of the control is discussed in section 3.3.2 (in relation to upstream competition where the implications will be greater given the higher levels of capital investment involved).

Specifying the control as a cap on prices would increase the risk the firm bears for any fall in its market share thereby increasing incentives for improving competitiveness. This effect would only be felt by the firm for the length of the price control and then only if there was no mechanism within the price control that treated demand as an exogenous risk. In any case a price cap would also increase the firm's incentive to increase demand in order to maximise revenue. This may be problematic if trying to encourage water efficiency.

Overall, with partial competition, an *ex ante* control would not appear to hinder the development of efficient retail competition. Although, the extent to which an incumbent feels the effect of any competitive market forces may be blunted by the presence of the control (depending on its specific design).

Adapting the control to emerging competition

As either full or partial competition emerges the *ex ante* control could be adapted. The evolution of retail price regulation in the UK telecommunication sector is useful for illustrating how this may occur (see text box 2 below). It also highlights an overall strength of the various *ex ante* controls, namely their flexibility and adaptability in the face of change. *Ex ante* price controls can be varied or adapted in various ways in order to achieve the best balance of trade-offs for the circumstances faced. This would include adapting to any changes in the market structure resulting from the emergence of competition. This adaptation does not need to occur in one step rather it could take place over a number of review periods. In addition *ex ante* controls can be complemented (and progressively replaced) by other lighter handed regulatory tools as competition develops.

There do not appear to have been any highly visible implications arising from the progressive adaptation and replacement of price cap controls in the telecommunications sector. This de-regulation did not occur in isolation and was supported by numerous market studies and continued developments in wholesale

Ex ante price controls

price regulation (see box 3 in section 3.3.4). Also this transition did not occur overnight. It took place over 25 years. It is uncertain whether the industry would have benefited from faster de-regulation.

Box 2 – Relaxation of the retail price cap in the UK telecommunications sector⁷

In this case study we trace the regulatory changes that have occurred in the retail telecommunications sector, which has moved from full price cap regulation following privatisation in 1984 to a largely de-regulated market. Regulation in the fixed line telecommunications industry was always thought of as transitory as effective competition was believed to be possible.

Phase 1 – 1980s, introduction of a single competitor

At the time of privatisation an RPI-X price cap was applied to a basket of BT's retail products. This was chosen primarily for its incentive properties and consistent with this the required efficiency savings became more stringent under each subsequent control — RPI-3% from 1984 to 1989 to RPI-4.5% from 1989 to 1990.

In 1984 the Government enabled a single competitor (Mercury) to enter the market and compete with BT across all levels of the value chain. It feared that multiple competitors would not be sufficiently strong for efficient infrastructure competition to develop. By 1991, Mercury had only gained a 3% market share and concerns existed around the potential for strong competition to develop.

Phase 2 – 1990s, the rise of new competitors

In 1991 various barriers to entry were removed at the network and retail levels starting with services to high spending residential and business customers. By 1997-98, a range of regulatory tools were applied to different retail prices depending on the degree of competition in the segment of the market.

- The *ex ante* price caps covered residential line rentals, and local, national and international calls.
- Small businesses were protected by a pegged tariff rules that required BT to offer a business package with a price equal to the reference residential tariff (which was subject to the price cap).
- After being assessed as fully competitive some business and residential segments of the market were removed from the scope of the control.

⁷ Source used in this case study include Ofcom (2004) “Strategic Review of Telecommunications - Phase 1 consultation document, Annex G “Review of regulatory policy in the telecoms sector”; Ofcom (2005) “Final statements on the Strategic Review of Telecommunications, and undertakings in lieu of a reference under the Enterprise Act 2002”; Ofcom, (March 2009) “Fixed narrowband retail services market - consultation on the identification of markets and determination of market power”.

- A safeguard tariff (RPI-0%) was also introduced on leased lines below a certain capacity.

Phase 3 – end 1990s, competition favoured by wholesale products

In 1999 Oftel consulted on the continued need for a price cap regime⁸. A market study on the level and effectiveness of competition across various segments was also undertaken. Oftel concluded that although competition had widely developed and residential prices had fallen, the market was not yet fully competitive. As an outcome of the reviews new wholesale products were developed to further facilitate the development of competition.

Phase 4 – 2000s, a largely deregulated market

By December 2005, a subsequent review of the market concluded that competition had expanded. A safeguard price control was set at RPI+0% in 2005, and in 2006, it was allowed to lapse. At this point the regulator Ofcom had almost entirely withdrawn from regulation of the fixed lines retail market.

After the retail price cap was removed, BT was still subject to specific regulation relating to the pricing of bundled service which related to preventing margin squeeze. These final constraints were removed after a 2009 consultation suggested that the market was sufficiently competitive.

The only remaining regulation still applied to BT's retail operations is the Universal Service Obligation (USO) which requires it to provide telecommunication services to vulnerable customers at a special tariff scheme.

What can be drawn out from the above is that following privatisation the retail price cap was used to secured efficiency savings. However, over time retail price controls became increasingly lighter handed, before being finally removed when the market was considered sufficiently competitive.

This de-regulation did not occur in isolation and was supported by continued developments in wholesale price regulation (see box 3) which helped widen the choices available to customers. The specific circumstances in the telecoms market (rapid technological development and the possibilities for switching between cable and mobile networks) may have affected the smooth transition from regulation to competition.

It is worth noting that this transition occurred over 25 years, and there have been no highly visible unintended consequences. It is uncertain, whether the industry would have benefited from faster de-regulation.

⁸ Oftel "Future developments in the competitiveness of UK telecommunications markets", July 1999

3.3.2 Maintaining an *ex ante* price control over an incumbents upstream operations

With a full and effective wholesale market

With a full and effective wholesale market, maintaining an *ex ante* price control which covers an incumbent's upstream operations would be ineffective. Effective competition in the wholesale market should lead to prices for these services reflecting their efficient costs. Therefore, the rationale for continuing to regulate the upstream costs and revenues of the incumbent would no longer be relevant. Any control that remained in place may impose an unnecessary regulatory burden and hinders the incumbent's ability to compete effectively.

In the context of full and effective upstream competition an *ex ante* control covering these activities would not be compatible with promoting efficient retail competition.

We note thought that it might be necessary to apply an *ex ante* control to the charges of any firm tasked with operating the wholesale market.

With partial upstream competition

Where upstream competition is emerging — for example from alternative treatment plants, supply from interconnection assets or from water purchases in the trading market — there may still be a need for an *ex ante* control that applies to an incumbent's upstream operations.

It is possible that upstream competition may emerge in particular areas only. As discussed in relation to partial retail competition applying single till price or revenue caps, in circumstances where competition only occurs in segments of the market, may actually protect the incumbent from the full force of the market. For example, assume an alternative upstream supplier purchases and then treats water using its own plant at lower cost than the incumbent. Even if this development makes some of the incumbent's upstream operations redundant it may still be able to recover revenue associated with this asset through the price control. This would increase prices across the incumbent's areas of operations and decrease its incentive to make efficiency improvements and efficient investment decisions.

The extent to which this is true will depend on approach adopted for determining the regulated revenue requirement under the price control.

Under an FCM approach regulated charges are set to allow the recovery of the capital invested. In other words there is no scope for assets to be stranded from the RAB. This would reduce incentives on the incumbent to undertake efficient investment. However, this would also provide certainty in relation to any payback on investment. This may feed through to a lower investor perception of risk and therefore a lower cost of capital.

Ex ante price controls

In contrast under an OCM approach the value of existing assets in the RAB can be re-valued to reflect asset obsolescence. This is also true under a LRIC based approach. These approaches more closely replicate the expected outcome in a competitive market and as such promote allocative efficiency. However, these approaches also raise the risk of historic capital expenditure being stranded. This could feed through into a higher perception of risk and a higher cost of capital.

Trading off increases in market driven efficiency in favour of a lower risk profile may be more advantageous in sectors or segments:

- which are exposed to lower levels of competition such that any allocative efficiency gains from competition may be lower;
- where investments involve large costs such that the benefits from a lower cost of capital are higher; and
- where the regulator is more certain of what investment is appropriate and optimal such that the likelihood of the control continuing to fund any stranded, redundant assets is lower (see section 3.4 for further discussion of this).

Any decision around whether to move from one form of price control to another will depend heavily on the segments and sectors to which the price control is being applied. If a separate price control was developed for an incumbent's upstream operations it could take a different form from a control that is applied to both or indeed only to its downstream network operations.

3.3.3 Setting the network access price using an *ex ante* price control

Where a vertically integrated, dominant incumbent continues to exist it is possible that it may attempt to drive out rivals, particularly as competition emerges, by:

- strategically squeezing the margins of rivals; or
- limiting rivals access to any bottleneck infrastructure it controls or wholesale services it provides.

Ex ante controls are designed to set a cap, not a floor, on prices and so cannot be used to address any margin squeeze or predatory pricing concerns. Other regulatory approaches discussed in chapter 7 & 8 would be more appropriate for this.

However, an *ex ante* control may be an appropriate for determining the price paid by rivals for the incumbent's wholesale products or for its network distribution services (the 'network access price'). Such a control would prevent an incumbent limiting rivals' access to these products or services by charging an excessive price. Therefore it would facilitate the development of efficient competition. In

Ex ante price controls

applying this or any form⁹. of network access price control Ofwat would need to consider whether to be:

- pro-active and define the specific services/products provided by the incumbent in order to set encompassing controls; or
- re-active and develop price controls that respond to potential retailers or upstream operator's specific requirements.

If wholesale regulation in the UK telecommunications sector is anything to go by the regulatory regime may need to adapt as competition emerges (see text box 3 below).

Box 3 – Evolution of wholesale price regulation in the UK telecommunications industry¹⁰

The telecommunications wholesale market regulatory regime could be considered a success given the emergence and development of competition in the industry. The regulator opted to regulate prices for a range of targeted wholesale products, adapted to entrants' requirements. This approach has led to a complex regulatory structure. But it does not appear to have prevented the development of significant competition.

Until 1998, the wholesale regulatory regime focused on the level of BT's access charges for interconnection to the network.

During the duopoly years (until 1991), interconnection charges between BT and Mercury were regulated by a two-part tariff (up-front charges plus a per-minute charge), which was subject to a price cap set at RPI-3%. However, the process for securing interconnection was complex.

In 1991, the interconnection process was simplified. Competitors were allowed to buy BT's leased lines¹¹, at a regulated price equal to the retail price level. This level was set to preserve incentives for competitors to invest in access infrastructure.

A new *ex ante* control on interconnection charges was introduced in 1997 based on a LRIC approach which valued assets based on their replacement costs. This had the effect of reducing BT's interconnection service charge. Lower charges allowed competitors to reduce their prices and placed greater competitive pressure on BT.

1998 marked a turn in telecommunications regulation. First, the E.U required Carrier Pre-Selection to be introduced which enabled consumers to pre-select a carrier for their calls, rather than dialling an access code in advance. Second, the growth in the internet

⁹ An alternative approach could be to use a top down or retail minus control discussed in section 7.1.

¹⁰ Source used in this case study include Ofel, July 1999, "Future developments in the competitiveness of UK telecommunications markets - A Consultative Document issued by the Director General of Telecommunications" and Ofcom (2004) "Strategic Review of Telecommunications - Phase 1 consultation document, Annex G "Review of regulatory policy in the telecoms sector".

¹¹ A leased line (otherwise known as a 'Private Circuit' or 'Data Line', is a permanent exclusive network connection between two points (this product has been widely bought in the City of London).

created demand for new wholesale products which allowed new competitors to enter the market.

The regulator did not actively create a new suite of products, in response to these and other developments. Instead it favoured a somewhat reactive approach whereby it created charges for wholesale services based on retailers' requirements. However, it did encourage retailers to come to it with propositions. In the early 2000s a variety of additional wholesale products were created, on an ad-hoc basis.

The alternative could have been to set prices for the various individual components of the services provided by BT which could have been built up to generate an individual access price to meet any retailer's specific requirements. This was deemed infeasible given the unpredictable variations often sort by retailers.

The approach adopted has increased the complexity of the wholesale products offered, and the associated regulatory framework. Each wholesale product is subject to its own five year price review period. These reviews do not occur simultaneously, which increases the likelihood of inconsistencies developing in the pricing of the various products. This may have created distortions in the retailers' decisions, but no distortion in investment has been clearly visible. It is unclear, whether this had a distorting effect on competition in general. This was, however, a pragmatic regulatory approach and one that appears to have been successful in facilitating the development of competition in the industry.

3.3.4 Complementary mechanisms associated with the network access price control

Transfer pricing and accounting separation

Regardless of their specific form an access price control will require complementary mechanisms that ensure rivals pay equivalent network access prices on similar terms to the incumbent if they are to promote efficient competition.

In particular transfer pricing and accounting separation arrangements may be required to ensure the incumbent can not shift costs between the upstream and network components of its operations. Otherwise it could use this flexibility to push up the regulated network access price in order to foreclose either the upstream or retail market.

Box 4 focuses on developments in the telecommunication sector for ensuring comparable access¹². Telecoms networks are perhaps somewhat different from energy or water networks in that several products make use of the same assets. This does tend to create an additional degree of complexity in the allocation of costs and this is reflected in the comprehensive LRIC model used to allocate

¹² The development of price controls in UK telecommunication sector is described in Box 1 (Retail Price Caps) and Box 2 (Wholesale Price Regulation).

common costs across the various products. However, the underlying principles are still of relevance to other networks.

Despite the very significant effort and resources devoted to apportioning common costs and close scrutiny across a number of price controls, it became evident that effective competition in broadband was unlikely to develop without further significant change. It was clear that competitors did not believe that they had comparable access to BT's network in terms of the equivalence of the product and provisioning processes, and the price. As a result, the regulator concluded that a much greater degree of separation was needed to remove barriers to competition and investment.

Box 4 – Vertical separation in UK telecoms

Prior to 2005, BT's regulatory obligations relating to its network services were two-fold:

- price regulation on key wholesale products to ensure efficiency; and
- accounting separation, which divided the company into business units and detailed the transfer charging mechanism between the network and retail businesses, to assist with both identifying any cross-subsidies and supporting non-discrimination between BT's wholesale customers and its own retail group.

Between 2003-2005, the UK communications regulator Ofcom after undertook a review of the UK telecommunications sector in order "to ensure the development of a competitive communications market that is capable of providing consumers, both residential and business, with a range of narrowband based services, widespread broadband availability, and value for money and choice across a range of high quality and innovative services". Its review concluded that the broadband market was not sufficiently competitive. This corroborated a view of the other communications providers that they did not have access to BT's network on a comparable basis to that of BT's retail division in terms of equivalence of product, provisioning processes and price.

In order for Ofcom to achieve its stated competition objectives, it would be necessary to address these barriers to competition and investment by a fundamental shift in the regulation of BT. Ofcom and BT structured a set of agreements, or undertakings, which covered how the incumbent would deliver an organisational solution to the issues addressed by Ofcom's review. While Ofcom had weighed up the possibility of a break up of BT via ownership separation of the network from the rest of the company, it opted for functional separation of BT that resulted in the creation of two organisational units with specific rules governing their relationships with other BT operations and other communications providers. This was to ensure that all service providers had transparent and equal access to the nationwide local BT network. The two units were:

- Openreach: a functionally separated access network business unit; and,
- BT Wholesale: a division providing wholesale network services.

Openreach controls and operates (ownership remains with the BT Group) the access network that connects customers to the core telephony network, namely the fibre and copper subscriber lines, the duct, and other non electronic assets in the access and

Ex ante price controls

backhaul. The key products sold to its customers (BT Retail and other retail service providers and BT Wholesale) are regulated access services, namely: wholesale line rental, local loop unbundling and ethernet services.

BT's functional separation agreement with Ofcom required Openreach, among other things, to:

- operate as a separate division within BT with its management team housed in access controlled accommodation separately secured from downstream BT businesses;
- have separate operational support systems;
- provide network products on the same timescales, terms and conditions and using the same systems and processes when providing such services to both BT's downstream businesses and to other communications providers;
- have charges calculated on the same basis for BT and other communications providers and information in regard to those charges provided in the same manner for both parties;
- have separately identified transfer charges in its regulatory accounts for products provided to and from Openreach and other BT divisions; and
- be subject to oversight by the Equality of Access board, which was to monitor, report and advise BT on Openreach's compliance with its regulatory requirements, with a specific focus on the provision of its products to all communications providers on an equal basis.

In addition, these services remain under price regulation. Local loop unbundling, for example, is under a regime of RPI+5% for full unbundling and RPI+1% for partial unbundling. Initial price levels under the 2009 price review were set using a fully allocated cost and current cost accounting asset valuation methodology.

BT Wholesale, the second organisational unit, is a sales channel to market for the wholesale services of BT's network, other than the above noted access services of Openreach. BT Wholesale provides network services and solutions, including, traffic conveyance, private circuits, and other managed network solutions to both BT Retail and to other communications providers.

Its mix of products contains both regulated and unregulated services. The regulated services include interconnection (both call termination and origination), low bandwidth leased circuits and wholesale broadband access (which requires inputs from Openreach).

While these regulated services were not seen as a major competition issue by other providers, these services are required, as part of BT's agreement with Ofcom, to be managed sold and reported separately from BT Wholesale's unregulated services.

Approaches for managing other operational interactions that may arise

Complementary approaches will also be required for regulating the new operational interaction that arise from having multiple retailers or operators in the market. While operational interactions may not appear to have the direct

Ex ante price controls

price/cost and quality implications that existing price controls in water are used to dealing with, operational interactions are nonetheless important in enabling effective and efficient operations along the value-chain.

Ideally, the participants in any new competitive arrangements would deal with any performance issues around operational interactions themselves. However, since deficiencies in the operational transactions could create barriers to successful entry, there may be a need for regulatory interventions to inhibit potential adverse behaviours of dominant incumbents, which could arise either on a deliberate or unintentional basis.

Operational and market codes may be appropriate mechanisms to address these concerns. Annexe 5 provides examples of these codes from the competitive Scottish water market.

Chapter 8 of this report describes a number of 'lighter touch' regulatory approaches that can also be used to address concerns around the market power of a dominant incumbent. Aspects such as non discrimination obligations and informational remedies/disclosure requirements are likely to be particularly relevant in addressing issues around operational interactions.

3.4 Consequences for investment and innovation

Future changes in the sector's operating environment may mean significant adaptation of the infrastructure will be required in the future.

In this section we further consider whether or not the various *ex ante* controls provide incentives for efficient investment and the scope for future innovation.

3.4.1 Consequences for investment

As discussed in section 3.3.2 if investment needs are large this would favour price control forms that allow any capital expenditure made to be recovered through prices. This would result in lower financing risks and therefore lower financing costs. Conversely, where there is less certainty around what represents efficient investment this approach may limit the regulator's ability to take advantage of future innovations and efficiencies that arise.

The appropriate trade-off between these two factors may differ depending on which segments of the supply chain is being considered.

If in the future major investment programmes are focussed in the network segment Ofwat may be more certain that the assets created are unlikely to become completely redundant¹³. In these circumstances the benefits of a low risk

¹³ Even though this investment may not have represented the most efficient solution.

form of regulation may outweigh the benefits from more flexible / incentivised forms.

This would favour *ex ante* price or revenue caps based on a building block FCM approach in order to encourage investment. Rate of return regulation may result in an even lower financing risk, as the firm will earn revenue on any investments made. However, rate of return regulation will not necessarily encourage efficient investment. Rather, it may lead to ‘gold plating’. Ex post used and useful tests can be used to reduce this risk¹⁴.

In the upstream segments of the value chain there may be a greater risk of investments becoming stranded — for example through innovations in treatment technology. Therefore, if major investment programmes are focussed in this area “competition for the market” rather than “competition in the market” may be more appropriate. With competition for the market tendering or franchise agreements for sizeable investments may be more appropriate.

3.4.2 Consequences for innovation

Future changes in the sectors operating environment may cause uncertainty around what future investment is appropriate and optimal. Optimal solutions could vary from company to company, over time, and across segments of the supply chain as new innovations are introduced.

When companies have the appropriate incentives to invest¹⁵, innovate and improve their services, they can increase productivity and lower costs over time. Some controls may be better at incentivizing innovation than others.

Innovation can be encouraged by targeting controls at outputs. For example by regulating the total service received by customers rather than specific price levels. This enables the most efficient approach to meeting these outputs to be used. Uncertainty around the most efficient mechanisms for delivering any outputs would increase the effectiveness of regulating on this basis.

Price controls that de-link the regulated revenue from a firm’s actual costs (such as LRIC based approaches) provide greater incentives for out-performance. Therefore, they may also encourage innovation.

Otherwise regulators have attempted to address the limitations of the building block approaches by introducing a greater output focus through yardstick and benchmarking techniques (see Annexe 2). Some of these options have already been pursued by Ofwat.

¹⁴ Depending on the specifics of any test applied a used and useful test may increase the risk of ex post appropriation, this may somewhat increase the risk of investment and costs of financing.

¹⁵ Some innovations may involve significant upfront expenditure with major savings arising in future years. Therefore, encouraging investment and innovation are not mutually exclusive.

Some price controls introduce output efficiency targets or other incentive schemes into the price control itself. However, technological innovations may also involve trade-offs between capital and operating expenditure. Price controls may discourage this type of innovation if they consider operating expenditure and capital expenditure separately. For example by applying separate benchmarking to these expenditures. In this circumstance adopting a more aggregated approach (i.e. by benchmarking total costs) may lead to more innovative, co-ordinated solutions. Experiences in the energy sector highlights these issues (see text box 5 below).

Demand management innovations may require the use of new tariff structures or other solutions to manage demand or wastewater discharges. All the alternative *ex ante* controls would be compatible with this.

Box 5 – Incentive schemes for transmission operating expenditures in the UK electricity sector¹⁶

In the late 1990s unintended consequences led Ofgem to change the various incentive schemes used in regulating electricity transmission. This case study explores these changes.

Electricity transmission can be separated in two activities — those associated with the System Operator (SO) and Transmission Owner (TO).

- The Transmission Owner is responsible for the efficient maintenance and development of the network.
- The System Operator is responsible for ensuring that demand and supply for energy on the network is balanced, and that planned production and consumption is consistent with the network's capability.

National Grid (NGET) is both the electricity System Operator and Transmission Owner in England and Wales. Until the mid-1990s, the two activities were commonly regulated using an RPI-X rule. This resulted in NGET making a trade-off between making capacity investments (capex) and paying congestion penalties (opex). To prevent NGET making these trade-offs Ofgem detached the regulatory schemes related to the TO and SO activities. In particular it introduced four separate SO incentive schemes.

Unintended consequences

The introduction of the four incentive schemes led NGET to maximise its profits under each scheme rather than adopting an overall approach to generating efficiency savings.

These observations were highlighted by Ofgem in 1999 who noted that “Although the present arrangements [...] are a substantial improvement compared to those in place [previously], a number of problems remain:

¹⁶ Sources used in this case study include: Ofgem 2009 “Regulating Energy Networks for the Future: RPI-X@20 Support document on History of Energy Network Regulation”.

- the incentives on NGC as SO are not integrated with those on it as TO;
- the use of four separate SO incentive schemes does not properly align the interests of the SO with those of consumers; and
- there is no targeting of costs towards those who cause them”.¹⁷

Regulatory update

Ofgem has since moved away from these mini-controls, and now sets a five year price control that covers:

- network opex and capital costs (the TO control); and
- the “internal” costs of the SO activity (the cost of the resources internal to National Grid which undertake system operation).

A separate one or two year SO price control covers some elements of “external” costs (the cost of procuring various energy or capacity services from market participants). Under this new regulatory approach NGET is responsible for optimising between the TO and SO activities, with reference to the various incentives and constraints.

The introduction of mini-controls in the mid-1990s appears to have been detrimental to the quality of service in the long term, but they might have had some initial success in helping identifying appropriate cost allocations.

The subsequent amendments to the incentive scheme are an example of the adaptability of the RPI-X price control. Large parts of the structure of the control have been modified, without the complexity of the control increasing and without significant irresolvable implementation issues.

Future changes in the electricity market (decarbonisation of the sources of electricity generation, new storage technologies) could require modifications in the incentive scheme of the transmission operator (to increase capital expenditure, or manage more variable network flows). In energy as with telecommunications and other regulator industries, the price control structure has not been fixed over time. It rectifies errors or drawbacks from previous schemes and constantly adapts to evolving market conditions.

3.5 Summary

The *ex ante* price controls — price caps, revenue caps and rate of return regulation— described in this chapter are all based on allowing the regulated firm to recover revenue equal to the efficient costs incurred in providing the service.

When well developed these controls provide a high level of certainty for the regulator in terms of addressing excessive pricing concerns. Assuming the regulator’s behaviour is predictable and transparent they provide certainty for a

¹⁷ Ofgem (1999) “NGC System Operator Incentives, Transmission Access and Losses Under the New Electricity Trading Arrangements”

regulated firm in terms of its ability to recover its costs. This encourages investment and provides greater security around the services ongoing provision. *Ex ante* price controls are also flexible and adaptable. They can evolve in various ways as circumstances in the sector change and they are compatible with other regulations relating to maintaining the quality of services and protecting standards. That said these approaches do impose a higher regulatory burden and can encourage strategic behaviour by firms at the time of the periodic review.

However, it is the specifics of an *ex ante* control that really drive the relative strengths and weaknesses. For example it is the extent to which the firm's regulated revenues are ultimately linked to its costs that will define the efficiency incentives of the regime. Similarly a price cap regime can lead to different outcomes when compared to a revenue cap. For example a revenue cap would provide stronger incentives for the firm to promote customer demand reductions, since these do not lead to a reduction in revenue. A rate of return regulatory regime can lead to different outcomes when compared to a price or revenue cap. For example rate of return regulation can limit the incentive on a regulated firm to become more efficient and encourage the firm to over-invest.

Compatibility with retail and upstream competition

Ex ante controls are not completely incompatible with the development and promotion of efficient competition and they may still have their place in an increasingly competitive environment.

If full and effective competition emerges in the retail or upstream segments of the value chain *ex ante* controls covering these segments will become increasingly unnecessary and ineffective.

But with partial competition, an *ex ante* control would not necessarily hinder the development of efficient retail competition. However, the incumbent may be protected from any competition by the price control (depending on its specifics). This may dampen any incentives for the incumbent to improve its efficiency. That said there are various mechanisms that can be used within an *ex ante* control to increase a regulated firm's exposure to competition.

A key strength of *ex ante* controls in the context of emerging contestability is their flexibility. These controls can be varied in different ways, in order to get the trade-offs right, for the circumstances faced such as any changes in the market structure. The evolution of *ex ante* controls in the UK telecommunication highlights this strength (see text box 2 & 3).

A weakness of *ex ante* controls is that they cannot be used to prevent predatory pricing by an incumbent in a contestable segment of the market. Other complementary regulatory approaches may be required to manage this risk (see chapter 7 and 8).

Ex ante price controls

In any case an *ex ante* control may still be required to control the price set for access to the incumbent's network. Other complementary regulatory arrangements would be required to support this change, such as accounting separation.

Compatibility with encouraging investment and innovation

It is the specifics of the various *ex ante* controls which define whether they provide incentives for efficient investment and scope for innovation.

Assuming the regulator's behaviour is predictable and transparent *ex ante* controls provide a regulated firm with certainty around the recovery of its costs. This can lower the financing risk therefore the cost of capital. Price or revenue caps based on a building block FCM approaches; or rate of return regulation would be most favourable in encouraging investment. However, rate of return regulation may also encourage inefficient over-investment or 'gold plating'.

However, with less certainty around what represents efficient investment these approaches may limit the regulator's ability to take advantage of any future innovations. Instead price controls that de-link the regulated revenue from the firm's actual costs will provide greater incentives for innovation and out-performance.

In general, innovation can be encouraged by targeting controls at outputs. Yardstick and benchmarking techniques can be used to do this. Where these efficiency targets or incentive schemes involve separate benchmarking of capex and opex this may discourage innovative, co-ordinated solutions. The experiences in the energy sector highlight the importance of these issues.

4 Length of control

This section considers the trade-offs involved in determining the appropriate length of an *ex ante* price control. We also consider the impact of increased contestability and the implications of increased investment needs and innovation for any decision relating to this.

4.1 Examples of price control length

In practice, most price, revenue and rate of return regulatory regimes set controls for a regulatory period of four to five years. This is true of the RPI-X regimes used in Britain and in the majority of European and Australian cases.

Table 4 shows a selected sample of price control periods used by regulators in the UK and abroad.

Table 4. Selected sample of examples of length of control period

Country / sector	Length of control period
UK water & sewerage	
- England & Wales	Originally 10 years – reduced to 5 years
- Scotland	4 years
- Northern Ireland	Currently 3 years
UK other utilities	
- energy: transmission and distribution	5 years
- airports	5 years
- rail	5 years
- post	5 years
UK other examples	
- London Underground contracts	7.5 years
- Train operating franchises	Typically 7 years, some longer
- PFI contracts	Typically between 10 and 30 years
European regulators	
- Ireland energy	5 years
- France gas transmission	2 – 4 years
- Netherlands energy networks	3 years
Australia	
- NSW water & sewerage	4 years
- Victoria electricity	5 years

Source: Frontier Economics

4.2 Main principles for determining the length of price control

The main principles that are relevant to a decision about the length of the price control are as follows.

- **Incentives for productive efficiency** — The longer the control, the longer the period over which actual costs and prices/revenues will be de-linked. This results in a high incentive for the company to reduce its costs (or improve its productivity), since it will benefit from cost savings for a longer time before they are potentially clawed back by the regulator. Therefore a longer price control may be more appropriate when there are significant potential gains from efficiency improvement. A potential issue is that incentives to increase operational efficiency may be weaker toward the end of price control periods. Firms anticipate the loss of their efficiency benefits at the start of the new control period, and therefore will wait for the start of this period to invest in efficiency savings.
- **Price signals and allocative efficiency** — As cited above the longer the control, the greater the de-linking between actual costs and prices/revenues. A longer price control period delays regulators from clawing back any efficiency savings which may result in prices not equating to cost. This may lead to allocative inefficiency, since the price signals that customers receive can diverge from the underlying costs. In a more competitive environment this could also distort entry and exit decisions.
- **Innovation and dynamic efficiency** — A longer price control period may also encourage dynamic efficiency. Some innovations and efficiency improvements will require upfront costs. A longer period allows the firm to internalise the benefits and costs of the innovation within a single control period.
- **Risk and cost of capital** — A longer price control can leave a regulated firm exposed to greater risks associated with factors, outside its control, affecting its costs. These can lead to a downside and upside risk for regulated companies. The regulated firm will face greater exposure to cyclical economic trends, which we would expect to feed through into a higher cost of capital. This would indicate that a highly capital intensive sector would benefit from a shorter control period with less exposure to exogenous risk. However, working against this, shorter review periods may increase the perceived risk of changes in regulatory approach.
- **Certainty over investment programme** — In many cases the price control review is used to establish the future investment programme, for the next

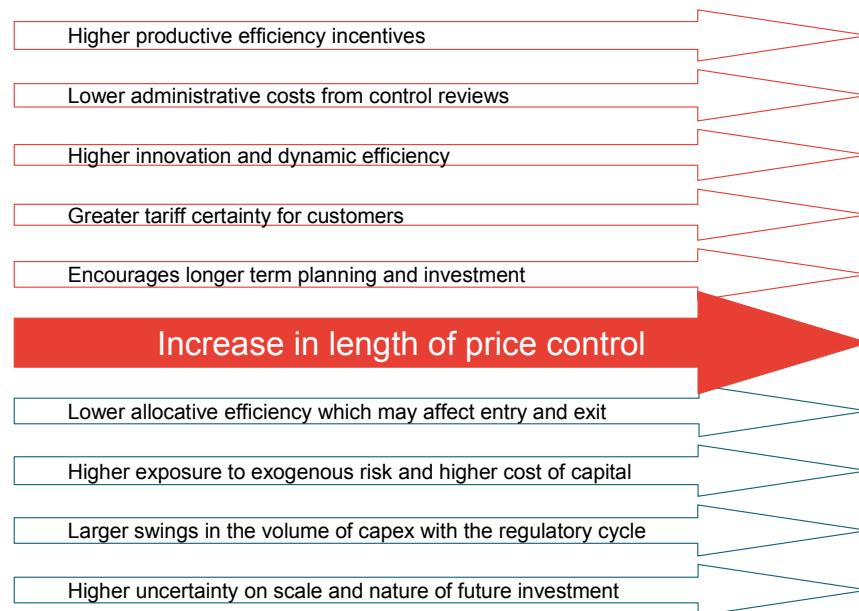
Length of control

control period and beyond. If there is uncertainty over the scale or nature of future investment needs then this may favour a shorter control period. This would enable the investment programme to be updated in a timely way.

- **Regulatory burden and administrative costs** — More frequent price reviews impose a greater administrative burden on both the firms and the regulator. Utilities in the US saw a significant increase in regulatory burden as the volatility of wholesale prices created the need for more frequent rate case reviews.
- **Tariff certainty** — A longer control also provides greater tariff certainty which may provide upsides for both consumers and potential competitors. Consumers may be more likely to undertake complementary investments when there is greater certainty around prices/revenues in the future.
- **Regulatory cycle.** The price control process can create a regulatory cycle. In particular, this can involve large swings in the volume of capital expenditure. It is possible that a longer control period would dampen the extent of this regulatory cycle.

These impacts are summarised in **Figure 3** below.

Figure 3. Impact of increasing the price control length



Source: Frontier Economics

Length of control

Longer term regulatory controls are often considered in capital intensive sectors in order to encourage longer term planning¹⁸, investment and efficiency savings. However, most regulators have estimated that forecasting uncertainties are too high for longer price controls to be developed using historic information.

It is important to note that the regulator may have alternative mechanisms for dealing with the principles outlined above. A regulator can address the weakness of a longer (or shorter) control period by using some of these other approaches. Examples of these alternatives are provided in **Table 5** below.

Table 5. Alternative regulatory mechanisms

Issue	Alternative regulatory mechanisms
Incentives and productive efficiency	<p>Incentive mechanisms that increase the proportion of saving retained by the firm.</p> <p>Rolling incentive mechanisms deal with differing incentives with the control period</p>
Price signals and allocative efficiency	<p>Pricing rules that aim for key tariffs to be set on LRIC / LRMC principles.</p>
Innovation and dynamic efficiency	<p>Incentive mechanisms that increase the proportion of saving retained by the firm.</p> <p>Specific rewards for funding for innovation.</p>
Risk and cost of capital	<p>Tools for passing on exogenous risk to customers with the price control. Includes indexation and reopeners.</p> <p>Risk of regulatory change associated with shorter review periods can be addressed through consistent application and a thorough process of consultation for changes to system.</p>
Certainty of investment programme	<p>Reopeners that allow significant changes in the investment programme to allowed within the period.</p>
Administrative costs	<p>Shorter review periods could involve less complex processes and data requirements.</p>
Tariff certainty	<p>Pricing rules that aim for key tariffs to be set on LRIC / LRMC principles.</p>
Regulatory cycle	<p>Investment cycle can be mitigated through rolling mechanisms and special provisions for investments during review period (e.g. Early Start programme).</p>

Source: Frontier Economics

¹⁸ For example Ofwat considered this in its last price control review.

One of most important of these alternative tools is the option to reopen the price control to deal with exogenous events. In practice, many regulatory regimes provide the flexibility for the review or re-opening of the control under certain circumstances. This is often used to protect regulated companies from the downside risk of unforeseen circumstances occurring during the price control which may have cost implications.

The problem of interim reviews and re-openers is that if they are too regular, or the clauses that permit them to occur do not provide a sufficient hurdle, then the system will suffer from the same problems as if the regulatory period were too short. This is further discussed in section 4.3 below.

4.3 Mechanisms to deal with exogenous risk

The greater the regulatory period the greater the forecasting uncertainty and the greater the risk of unforeseen circumstances affecting firm's costs over the period. In many industries refinements have been made to the basic control models to address this concern.

Typically uncertainties around forecast costs are addressed by including provisions for re-openers or, cost pass-through items. These can be either

- asymmetrical such that they only reduce the downside risks faced by companies; or
- symmetrical such they may correct for both upside or downside risks.

Details of these complementary mechanisms implemented to mitigate risks associated with expenditure uncertainties are contained in **Table 6** below.

Table 6. Mechanisms addressing uncertainties around forecasted costs

	Description	Goal	Example
Cost pass through	Allowing for certain costs borne by the regulated company to be directly passed through to customers, independently of the price cap	Limiting the risk borne by the regulated company in relation to costs outside its control	Limited use by most regulators French energy regulation often makes allowances for pass-through
Logging up and down,	Company 'logs up' any reasonable net additional costs to be taken into account at the next periodic review. Similarly reductions in outputs required are 'logged down'.	Providing assurance against small changes that are not in the companies' control, e.g. regulation	Used by Ofwat
Interim determi-		Providing assurance against large changes that are not in the	Used by Ofwat

Length of control

nation processes		companies' control, e.g. regulation	
General re-opener	Re-assessment of the costs outside to the beginning of the control period	Copes with financial difficulties of company If indicators show a system is going wrong	Used by Postcomm, and by US regulators
Specific re-opener	Re-assessment of the costs ulterior to the beginning of the control period	Deal with significant uncertainties, such as the timing of specific projects	Used by Ofgem

Source: Frontier Economics based on the following sources: CEPA (2009) "The use of RPI-X by other network industry regulators" report prepared for Ofgem; NAO (2002) "Pipes and wires", HC 723 Session 2001-2002: 10 April 2002

4.4 Impact of contestability on the length of the price control

A move towards greater market opening in parts of the value chain could have implications for the appropriate length of the control.

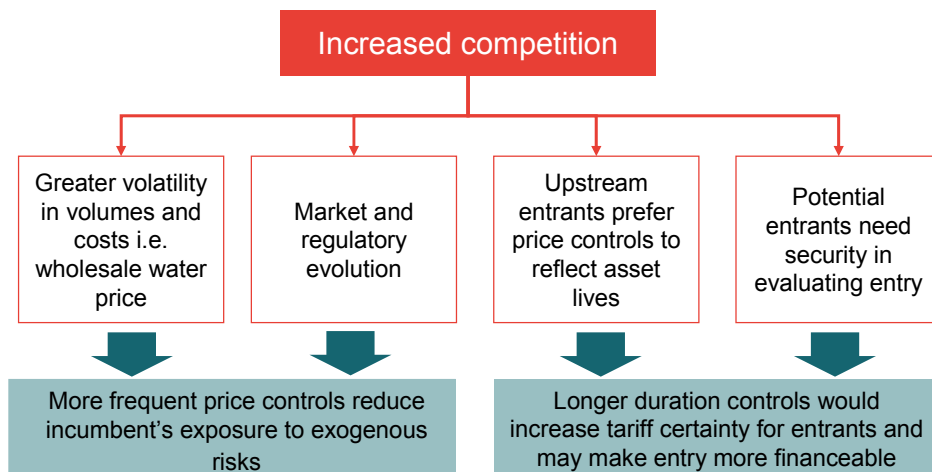
- A contestable segment of the value chain may be subject to greater volatility in volumes and costs (for example as customers switch to competitors or with water trading). This would strengthen the case for a shorter price control that mitigates against these risks.
- At the same time the development of effective competition may require a degree of tariff certainty for potential retail entrants, to assist them in evaluating the business case for entry. A shorter price control could be unhelpful. Although there could be alternative ways to achieve some certainty in this regard by making use of some of the pricing rules or tariff types discussed in chapter 7.
- Where there is entry in upstream activities, the price control arrangements may need to reflect asset lives. If new entry is via contracts for services delivered to a regulated incumbent consideration will need to be given to how any future price control deals with this (see discussion and example in section 3.3.2). It is also possible that entrants might prefer the opportunity to have access to a regulated income stream and hence could be subject to some form of regulation themselves. Longer duration controls might help make such entry more financeable and reduce the cost of capital.
- Finally, the appropriate form of price control is, in itself, likely to evolve as the market opens. A shorter control period will also enable the appropriate

Length of control

form to be adapted to changing circumstances. It is also possible to design trigger mechanisms that could bring forward the next review or could prompt the removal of the price control itself. For example, evidence on price competition or switching could lead to a removal of the *ex ante* control in favour of alternative forms of control (see chapters 7 and 8).

Figure 4 below summarises these implications for decisions around the appropriate length of the control.

Figure 4. Implications of increased competition on any decision around the appropriate length of a price control



Source: Frontier Economics

Increased contestability in segments of the supply chain may also result in the disaggregation of regulation whereby separate price controls are applied to separate segments of the value chain.

These price controls could have different lengths. For example the water and wastewater treatment activities could be subject to shorter regulatory periods than the network segment. This could be because the distribution network is associated with less uncertainty around future investment.

This would result in the price controls for different segments of the value chain being reviewed at separate times. It is worth noting that such a situation could also arise even if all segments of the value chain had the same review length, but that for practical reasons these reviews were staggered.

It is possible that with prices being set at different times uncertainty may increase for downstream firms, particularly in relation to:

- input prices for upstream services – this would impact on opex and therefore the firms revenue requirements; and

Length of control

- investment plans associated with upstream services – this may impact on any complementary downstream investment.

Both these uncertainties are likely to influence a downstream firm's behaviour. This increased uncertainty could also feed through to higher financing costs.

Uncertainty associated with the upstream firm's investment plans could lead downstream firms to wait for these to be approved before making any strategic or investment decisions. We previously highlighted that regulated companies can be incentivised, under *ex ante* controls, to invest during the first years of a regulatory round, internalise the benefits and costs from investments, and wait until the next round to make new efficiency investments. It is not clear that disaggregation of the control would lead to any additional strategic behaviour by downstream firms.

To mitigate these uncertainties the mechanisms for dealing with exogenous risk described in section 4.3 could be applied. In particular cost pass through approaches may be relevant to any changes in input prices.

An example of the application of separate price controls is contained in Box 6

Box 6 – Application of separate price controls by IPART

In Australia, IPART¹⁹ applies separate price controls for the businesses undertaking different supply chain activities. These price controls occur at alternating intervals and relate to the following businesses²⁰:

- Water Catchment Authorities – local monopolies responsible for the water resource and abstraction (bulk raw water, unfiltered water²¹); and
- Water Corporations – licensees who are responsible for water and wastewater distribution, sewage treatment and disposal and retailing.

IPART determines the various Catchment Authorities' bulk water charges and the Water Corporations' maximum charges for water, sewerage and stormwater services.

Over the past decade, IPART conducted three price determinations for the Sydney Catchment Authority (SCA):

- a five year control from 2000 to 2005;
- a four year control from 2005 to 2009; and
- the current three year control which will be effective until June 2012.

Over the same period, IPART conducted four price determinations for Sydney Water

¹⁹ IPART is the regulator for electricity, gas, water and transport in the New South Wales

²⁰ IPART "Review of prices for the Sydney Catchment Authority From 1 July 2009 to 30 June 2012"

²¹ Bulk Raw Water that has been managed for quality, whether by chemical treatment or otherwise but not treated at a water filtration plant

Corporation (SWC):

- a three year control finishing in 2003;
- a two year control from 2003 to 2005;
- a three year control from 2005 to 2008; and
- the current four year control which will be effective until June 2012.

In 10 years, SCA has been subject to five, four and three year price controls. Similarly the length of SWC's price control has also been varied. In general the control applied to SWC for its network and retail services is longer than that applied to SCA for its upstream resource and abstraction services.

In general, the start and end dates of the controls for SCA and SWC have not coincide. To mitigate any uncertainties arising from this IPART allows a yearly adjustment to be made to SWC's retail tariffs to reflect changes in the price of the bulk water supplied by the SCA. These increases in input costs are entirely passed through to customers. SWC considers that the pass-through mechanism is appropriate for mitigating the risk it faces²².

It is worth noting that the 2005 price determination for SWC was originally planned to coincide with SCA in 2009. However, over the course of the price control period climatic conditions changed significantly. This resulted in large investment needs. IPART consequently adopted the pragmatic approach of bringing forward SWC's price determination by a year in order to take into account the additional expenditures it faced²³.

Similarly, the decision to adopt a two-year price control in 2003 was determined by the changing environment — 2002-2003 was a drought year, and this led the regulator to consider temporarily increasing water tariffs to reduce demand.

It is worth drawing out two key points from the discussions above. First even if IPART sees the benefits of having simultaneous reviews for upstream and downstream regulated activities, it has in the past given the priority to other considerations.

Second the approach taken to passing through uncertain costs resulting from non-simultaneous price controls appears to have been accepted by stakeholders. The variation in the length of the price controls does not seem to have drawn significant commentary. It is possible that the changes in length were actually the lesser of the changes made to the price controls at the time. Indeed, the controls were progressively adapted and expenditure incentives schemes were also introduced.

²² Sydney Water submission related to the investigation: "Review of prices for the Sydney Catchment Authority from 01 July 2009"

²³ IPART 2008 "NSW Water Fact Sheet 4 Review of Prices for Sydney Water Corporation's water, sewerage and stormwater services"

4.5 Implications of increased investment and innovation for the length of price control

The following may also be relevant when setting the appropriate length of a price control in the context of the key challenges facing the sector:

- uncertainty regarding the size of any investment needs; and
- recoverability of that investment over the price control period.

With an *ex ante* control capital expenditure can be recovered over more than one regulatory period through the RAB, although this can create some uncertainty for the regulated firm. However, the longer the regulatory period the longer the forecasting uncertainty and the greater the risk of unforeseen circumstances affecting firms costs over the period. This could feed through into a higher cost of capital. Still, refinements, including provisions for re-openers or, cost pass-through items, can be made to the basic control models to address this concern.

A longer term price control would be less risky where the market is more stable (i.e. where there limited demand volatility) and is associated with less exogenous risk (or there is a possibility of hedging this). A longer price control would allow the firm to internalise the benefits and costs of any innovation within a single control period. This may encourage dynamic efficiency and therefore innovation and efficiency improvements over time.

5 Price control approaches relating to the unregulated activities of incumbents

In this section we consider the approaches that can be used for managing the unregulated activities of a regulated incumbent within the price control.

We also consider the strengths and weaknesses of these approaches and other supporting mechanisms that may be required to deal with any cost allocation issues that arise.

5.1 Rationale for regulatory intervention

Section 2.3 considers the forms of interactions that may arise in future, with an increase in contestability and/or price control disaggregation across the value chain.

Two particular themes may give rise to interactions between unregulated and regulated activities of an incumbent that may be of concern for the regulator – unintended interactions (driven by the existing regulatory structure) and innovation by companies.

Unintended interactions can arise when the incumbent takes part in newly contestable sectors, as well as continuing to undertake regulated activities. These may raise concerns around cost allocation or the usage of information. If the contestable activities of a regulated undertaking are able to benefit by allocating costs to regulated activities, or by making use of information held by the regulated undertaking, this could distort competition in the contestable sectors. This could arise in the allocations of costs between value-chain segments or within a particular segment when there is partial contestability, for example with retail competition for only some customers.

In such circumstances, price control apparatus may be required to prevent unintended interactions, both in respect of the pricing and non-pricing behaviour of an incumbent. These issues are discussed in section 3.3.3 in relation to determining the access price and in chapter 8 in relation to other lighter handed regulatory approaches that can be adopted.

Innovation by incumbent companies could result in several different types of unregulated activities.

- Sales of additional products to the customers of their regulated activities, where the products are closely related to those activities – for example, by making use of their retail relationships, companies could promote third-party insurance products covering wires or pipes within a dwelling.

- Sales of additional products to the customers of their regulated activities, where the products are unrelated to those activities – for example, branded credit-cards or other financial services.
- Generation of additional revenue from assets or other capabilities required to deliver the regulated activity – for example, the development of leisure services using water reservoirs or associated land, or the development of retail properties within transport terminal buildings.
- Diversification into unrelated activities – in principle, companies could choose to branch into new lines of business not previously considered.

These unregulated activities are already possible in water, and there are well established procedures to identify and separate costs and revenues including oversight by Reporters and Auditors. However, since contestability could trigger an increased focus on innovation by companies, there may be merit in reviewing regulatory approaches to dealing with these activities.

As discussed in section 2.3.2 some types of innovative behaviour by the incumbent may be of interest to the regulator. For example, where the incumbent undertakes new activities that involve the use of regulated assets or labour; or are complements to, or benefit from spillovers arising from the regulated activity. In these circumstances there may be a rationale for regulated consumers benefiting from some share in any profits generated through the unregulated activity²⁴.

The following sections consider regulatory approaches available in respect of the allocation of costs, revenues and profits.

5.2 Dual till vs. single till approaches

A key consideration where there is partial competition is whether to separate or combine the costs and revenues from the competitive and non-competitive activities. The two most recognised regulatory mechanisms reflect different groupings of costs and revenues – and hence different treatment of profits.

Under a **single till approach**, costs and revenues from the different activities are combined into a single regulated pot. This also means that all profits from the unregulated activity are taken into account in the regulated price control – in effect there is a full sharing of the profits. Prices for the regulated service are set to allow recovery of the aggregate costs from provision of the regulated and unregulated activities, less the projected revenue from the unregulated activities.

²⁴ Although this may also involve sharing some of the costs and risks associated with these activities

This is the system adopted for designated UK airports where the prices for non-aeronautical services are unregulated.

In contrast, a **dual till approach** seeks to separate (or allocate) the costs and revenues of the different activities. Depending on the nature of the activities and costs involved, there may be common costs which need to be apportioned between the different activities. Regulation then sets the price for the regulated service to recover the allocated (and other) costs, but there is no recognition of the revenue from the unregulated activity. This results in there being a zero share of profits from unregulated activities.

Hence viewed from the perspective of profit allocations, the single till and dual till approaches are at opposite ends of the spectrum with, respectively, 100% and 0% profit sharing. The dual till approach is the approach currently used in electricity and gas network regulation in the UK.

Ofwat's treatment of large user revenues lies somewhere between a dual and single till approach. These customers are not subject to the price control, but the expected revenues from these customers are taken into account when calculating the price caps for the other customer groups.

Alternative profit sharing mechanisms

With the dual till and single till mechanisms defining a spectrum with respectively, 0% and 100% sharing of profits from the unregulated activities, it is possible to envisage an alternative profit sharing mechanisms which lies somewhere in the middle of this range.

There are examples of sharing mechanisms relating to regulated activities. Incentive mechanisms essentially define an agreed share of efficiency savings on capital or operational expenditures between customers and shareholders. And profits from the sale of land by water companies are shared on a 50-50 basis. However, these examples relate to activities taking place within the regulated ring-fence, or the disposal of part of the regulated asset base. As such, there is a very clear economic case for the sharing, with the choice of share dictated by considerations around incentive strength.

Where profits are generated by unregulated activities, the situation becomes more complicated. Current approaches require that any assets, labour or services provided by the regulated undertaking are remunerated at the going market rate. However, the unregulated activity will incur costs related to inputs sourced from outside the regulated undertaking, financing and working capital costs, sales and marketing costs and so on. Further, the only risk that the regulated undertaker faces is that the unregulated company will cease to make use of its assets, labour or services. However, the unregulated activity may be exposed to competition, and face the risk that the enterprise will fail. In such circumstances, where the

Price control approaches relating to the unregulated activities of incumbents

risks are not shared, it is not immediately clear why a regulated undertaking should receive a share of profits.

There is, of course, no reason why the regulated undertaking should not request a share of profits. However, it would be likely that the unregulated entity would trade off any profit shared against any remuneration provided for the inputs provided by the regulated undertaking. It would then become a matter of commercial choice as to what trade-off to accept between higher and relatively certain revenues, and lower revenues with a share of uncertain future profits.

Where such sums are small, there is unlikely to be any great effect on the financial performance of the regulated undertaking. Hence there need not be significant regulatory concern about risks to the viability of the regulated business. Of course, this scenario may also raise questions as to whether the financial benefits are worth the effort involved.

5.3 Principles around the use of single or dual till approaches

Approaches adopted by regulators

Box 7 below summarises the experience of regulating partial retail competition in the UK electricity sector the 1990s. Public Electricity Suppliers (PESs) were allowed to take part in both contestable and non-contestable sectors of the retail market and their regulator (Ofgem) adopted a dual till approach.

As the box explains, there were a number of features of the market arrangements and the role of the PESs within it that meant that areas in which there might have been common costs or doubts around cost allocation were limited to perhaps 5-10% of costs. There was also a substantial degree of competition in the unregulated activity leading to reduced market power concerns. However, it is worth recognising that the dual till approach involved a temporary rather than permanent separation of activities. And the set-up of the market reflected a number of transitional requirements such as supporting medium-term coal-backed power sales contracts. Hence, while the use of the dual till approach appears to have worked successfully it is possible that, where these circumstances are not replicated, more issues may arise.

Box 7 – Regulation of partial retail competition in UK electricity

When the PESs were privatised in 1990, they initially benefited from a retail franchise in their defined geographic areas for all customers consuming peak load of less than 1MW. The scope of the franchise was reduced in 1994 when some 50,000 customers with peak load of 100kW became contestable. The franchise was then eliminated completely in 1998. The dates and stages of the progressive franchise reduction were stipulated as part of the initial privatisation and licensing process.

Price control approaches relating to the unregulated activities of incumbents

The progressive removal of the franchise reflected a number of requirements.

- The franchises enabled the creation of medium-term power sales contracts (known as the coal contracts) between the PESs and generators, which in-turn allowed the generators to commit to consumption of quantities of UK sourced coal.
- The phasing provided time for the necessary customer allocation, metering and financial settlement arrangements to be developed under the auspices of the Electricity Pool.
- The phasing also reduced the near-term uncertainty faced by PESs investors.

PES retail businesses were allowed to enter the competitive market outside their home areas. This business was covered by a separate second-tier supply licence which effectively created a dual till approach. This was associated with a significant degree of separation in reporting requirements. There were a number of features of the markets design which meant that the regulator could have a reasonable degree of confidence about the separation of significant elements of both costs and revenues.

Electricity retail businesses incurs a large proportion of their costs in the purchase of the electricity consumed. The proportion varies over time and as the level of wholesale prices fluctuates. As an indication, approximately 60-65% of a typical retail bill reflects consumption of the commodity. Of the rest, 25-30% represents the costs of T&D use of system charges. This leaves a relatively small proportion which reflects the retail businesses' own costs (e.g., billing and customer service) and the retail profit margin.

The Electricity Pool was a gross mandatory market requiring all generation to be bought and sold via the pool. Until the 1998 franchise termination, there was also a degree of separation between the financial settlement arrangements since all competitive customers were required to have meters which measured consumption in each individual half-hourly price period. In contrast, meters for franchise customers recorded only consumption since the last reading. They were also effectively outside the Pool financial settlement arrangements with the use of "reconciliation by difference" calculating the consumption for PES franchise customers as a single residual block.

The combination of pressures from very active competition and the separation in metering and settlement arrangements meant that there was little opportunity for misallocation of energy purchase costs between the competitive and franchise retail businesses. As the element of costs relating to network use of system charges was also effectively regulated via the network price controls, potential cost allocation issues were limited to only the 5-10% representing retailers direct costs and profit margin.

During the 1990s, the PES licences covered both electricity distribution and the in-area retail activities. This meant that cost allocation issues were also possible around the boundary between distribution and retail activities. Commentary from Ofgem around the PES price controls in 1995 and at the time of the franchise elimination in 1998 identified some concerns about cost allocations between activities, but primarily on the distribution/retail split rather than the competitive retail/franchise retail split. This resulted in some rebalancing of costs as part of the transfer schemes used to split PES distribution and retail activities in 2000.

Price control approaches relating to the unregulated activities of incumbents

Precedents on the use of a dual till approach can be found in UK air, UK rail and Australian air industries and these are summarised in Boxes 8, 9 and 10 below. It is clear from these examples that the debate over the respective merits of single and dual till approaches is an ongoing one.

The Civil Aviation Authority proposed a move to a dual till approach for the regulation of UK airport in 2002. However, the Competition Commission in the UK has yet to be persuaded of the merit of this change. The particular concerns it expressed related to the difficulties of separating the significant common costs, and possible distortions to investment incentives between regulated and unregulated activities. The Commission also expressed concerns about a lack of clarity in how the suggested benefits from a dual till approach, around increased investment and improved efficiency in the regulated services, would be realised. Broadly similar themes are evident in the UK rail example.

The example from the regulation of charges at Sydney Airport is a little older, dating back to 2000. Sydney Airport Corporation proposed a move from a single till to a dual till and the Australian Competition and Consumer Commission undertook an economic analysis of these alternatives approaches. As in the UK, the analysis concluded that the case for change was inconclusive with concerns about higher prices and hence allocative inefficiencies for both regulated and unregulated activities, which would only be partially offset by possible dynamic efficiencies around the provision of the unregulated services. The assessment of the single till approach was almost the exact obverse, with a greater likelihood of allocative efficiency in regulated services, but concerns about possible dynamic inefficiencies in unregulated services.

Box 8 – Single vs. dual till debate in UK airport regulation

The Civil Aviation Authority (CAA) uses an RPI-X approach and a single till regime for regulating the airport charges of the major UK airports. Airports generate both significant regulated tariff and commercial revenues. The regulated tariff is paid by airlines for operation and usage of infrastructure. While the commercial revenues come primarily from rental income from retail properties within terminals. Under a single till approach, the net commercial revenues offset part of the costs incurred in providing the aeronautical services and hence result in a lower level of regulated tariffs for these services.

The CAA proposed a move to a dual till approach in the 2002 reviews of Manchester and London Airports. However, to date, the Competition Commission (CC) has concluded that a single till regime should be retained. The CC has highlighted the following difficulties associated with moving to a dual till approach:

- difficulties in separating out the significant common fixed costs around capital investment;
- possible distortions to investment incentives between regulated and unregulated activities; and

Price control approaches relating to the unregulated activities of incumbents

- a lack of clarity on how the claimed benefits in terms of increased investment and improved efficiency in aeronautical services would be delivered.

The debate within the industry about the merits of a single or dual till is ongoing. The CAA has attributed some of the congestion in runway capacity in south-east England to the fact that the single till approach results in lower usage charges and hence encourages demand. The CC took the view that the Terminal 5 investment at Heathrow demonstrated that the single till system had not led to under-investment, and also questioned whether capacity utilisation efficiency benefits from a dual till system would be material. There was also concern over the rise in aeronautical tariffs that would result as well as the treatment of the extra net income that the regulated company would receive.

The issue has also attracted significant adverse publicity for BAA, with a perception that the company is more concerned, and thus more effective, at the development of retail services to the detriment of core services such as security screening. Since it can be argued that the single till approach moderates the commercial interest in the non-regulated services compared to a dual till approach, this illustrates some of the potential complexities and misunderstandings that can arise when multiple products are involved.

Box 9 – Single vs. dual till debate in UK rail regulation

In 2008, a review of Network Rail's regulatory regime was undertaken by the Office of Rail Regulation (ORR). Within this review, the single till model was used whereby the revenue earned by Network Rail from commercial property was netted off in order to calculate the income that Network Rail requires. Network Rail recovers its gross revenue requirement through the income it receives from four areas:

- track access charges from passenger and freight operators (a number of different types of access charge exist);
- network grants which the regulator allows Network Rail to receive from government in lieu of track access charges;
- the station long term charges paid by users of stations; and
- other income such as commercial property.

As with airports, a key question within the review process was whether this method gave the most appropriate incentives for the company or whether a more detailed regulatory regime with separate price controls for different services would offer benefits.

The ORR took a similar view as the CC in airports, deciding that the existing single till was preferable as this approach maximised the benefit to the total industry (as a result of taking into account Network Rail's commercial activities in the access charge setting). Conversely, a dual till approach raised the risk of significantly increased access charges for the same service as train operators receive at the moment.

**Price control approaches relating to the
unregulated activities of incumbents**

Box 10 – Single vs. dual till debate in Australian air regulation

At the end of 1999, Sydney Airport Corporation (SAC) submitted a pricing proposal which included a shift from a single till to a dual till approach. One argument used was that the Government intention was not to subject the entirety of an airport's operations to control or monitoring. The Australian Competition and Consumer Commission (ACCC) undertook an economic analysis of the respective merits of the two approaches.

The ACCC's analysis of dual till highlighted the likelihood of incentivising airports to a) set prices for unregulated services to a profit maximising level; b) set prices for both regulated and unregulated services to the maximum possible under regulatory constraints by shifting all common costs to regulated services; and c) to increase investment in regulated services where the allowed cost of capital was above the true cost of capital.

These incentives were thought likely to increase total revenues above total costs, raise prices for both regulated and unregulated services compared to a single till approach, and encourage commercially viable investment in unregulated services. Allocative inefficiencies from the higher prices were expected to be only partially offset by dynamic efficiencies from having more competitive unregulated services.

The report also highlighted four principles around the allocation of costs²⁵.

- The allocation of common costs cannot result in the total cost of regulated services exceeding the stand-alone cost;
- Common costs should not be over-recovered – meaning that the sum of incremental and common costs should not exceed the stand-alone costs or providing the full set of regulated and unregulated services;
- Under dual till, it is important to check that common costs have not been loaded onto the regulated activity in order to inflate regulated revenues;
- The share of common costs allocated to unregulated services should not limit the ability of the airport to compete effectively.

The assessment of single till was largely a mirror image of the dual till approach. The expected outcomes were lower regulated prices, higher unregulated prices where the incentive to expand regulated services was strong, total revenues equal to total costs and possible under-investment in unregulated services. Allocative efficiency benefits were expected as a result of the weaker incentives to distort cost allocations, but this may be offset by dynamic inefficiency from weaker incentives to invest in unregulated services.

The overall conclusion of the report was that careful consideration was needed on the issue of cross-subsidisation under single till and the challenges of allocating common costs under dual till. There was, however, insufficient information to conclude on the extent of cost allocation inefficiencies under a dual till approach.

²⁵ Cited in 'Dual Till' at Sydney Airport', A Report prepared for the Australian Competition and Consumer Commission by the Network Economics Consulting Group, May 2000.

Guiding principles

While it is difficult to draw a single conclusion from the examples above on the respective merits of single and dual till approaches, it is possible to identify a number of factors or principles which may guide the appropriate choice:

- **The existence of complementarities and spillovers between the regulated and unregulated services** — A single till approach may be more suitable where the regulated activity is interrelated with the use of the unregulated activity such that demand for one will generate demand for the other. Similarly, where the regulated activity generates spill over benefits for the unregulated activity (for example a cost reduction).
- **The existence of shared costs** — the greater the assets and therefore costs that are shared between the regulated and unregulated service the more suitable a single till approach.
- **The separability of costs and revenues between the regulated and unregulated services** — the greater the difficulties or uncertainties involved in making cost allocations, the higher the risk of a dual till approach leading to over recovery and the more suitable a single till approach.
- **The materiality of costs in possible areas of allocative doubt** — where any common costs represent a small proportion of the total costs of the regulated activity, the risks from a dual till approach are reduced.
- **Concerns about market power in the unregulated activity** — a single till approach can offer a degree of remedy against excessive pricing. At the same time, the single till approach may encourage exclusionary or predatory pricing of unregulated services.
- **Appropriate allocation of risks in unregulated services** — a single till approach can reduce perceived risk in unregulated services and if left unchecked, could encourage over-investment.

5.4 Supporting mechanisms to deal with cost allocation issues

Given the significance of cost allocation issues in the choice between a dual till or single till approach, it is worth considering whether alternative support mechanisms exist which might help reduce cost allocation issues. Four possible approaches have been identified:

Price control approaches relating to the unregulated activities of incumbents

- **Using a LRIC based approach** – bottom-up cost modelling of the regulated service as a stand-alone activity can be used to avoid difficulties in cost allocation between regulated and unregulated activities. The drawback of this approach is that LRIC can be complex to model. In addition a stand alone service may not be realistic, in which case some allocation of common costs would still be required – this has been an issue in telecoms markets.
- **Enhanced cost allocation guidelines** – the regulatory accounting guidelines (RAGs) used in water could be developed further to deal with future cost allocations issues, as has been contemplated under Ofwat’s accounting separation project. A review process for RAGs could anticipate potential area of doubt and misallocation and provide the necessary guidance. However, if cost allocations become more dynamic as a result of increased contestability, then it may be challenging for RAGs to anticipate changes rather than react to them.
- **Explicit regulatory directions** – explicit regulatory specification of how costs should be allocated can reduce the scope for misallocation. Although, as discussed in relation to RAGs, this approach may not be easily adaptable in the face of industry changes. An example of this approach exists in the Irish retail gas market where Bord Gais, the incumbent, is only allowed to supply using a tariff as directed by the Irish regulator.²⁶ This direction sets out a detailed tariff methodology covering gas commodity costs, gas flexibility costs (swing) and various transportation costs. There is also an allowance for the retail service cost and an allowed level of profit (expressed as a gross margin). The prime motivation behind this approach relates to market power concerns. However, a secondary consequence is that the tariff direction effectively removes, or greatly reduces, the scope for cost misallocation between the unregulated competitive segment and the directed tariff segments of the market.
- **Explicit contractual recognition of costs and services provided** – There have been a number of instances where unregulated businesses have been developed by regulated companies and then sold-off. The contract developed, as part of these transactions, provide clarity on the costs and services between the regulated and unregulated business, and how these will be provided in the future. Subject to the quality of the due-diligence

²⁶ The Irish gas market is divided into a number of segments reflecting the size of a customer’s consumption. All segments are competitive as customers’ can chose their retail supplier, but apart from the very largest segment, Bord Gais the incumbent, is only allowed to supply using a tariff as directed by the Irish regulator. The prime motivation behind the approach adopted by the Irish regulator is to mitigate Bord Gais’s market power through dominance and encourage market entry by competitors.

undertaken at establishment, contracts should result in greater transparency and a reduced regulatory burden when compared to ongoing ad-hoc cost allocations. Where there are material costs involved or significant potential issues surrounding cost allocations, a requirement to put in place an explicit contract even where a sale is not contemplated could deliver similar benefits.

5.5 Appraisal of these approaches

As discussed in section 3.3, where a value chain sector has full and effective competition, an *ex ante* price control covering the incumbents operations in the contestable segment would be unnecessary and ineffective. Hence, interactions between an incumbent's regulated and unregulated activities within that segment of the value chain, would not arise.

Where partial competition exists, the potential disadvantages of a single till approach are also set out in section 3.3. Namely, a risk of higher prices in the non contestable sector and less competitive pressure in the contestable sector. In the context of considering regulated/unregulated interactions within the same value chain segment, the application of a single till approach is arguably something of a non sequitur since the potentially unregulated element is then being subject to regulatory influence.

Where interactions occur between value chain segments, or as a result of extensions to the value chain, this is more analogous to the precedents from airports and hence the choice of single or dual till is relevant. The examples reviewed suggested that the greater the difficulty of separating costs and revenues (between regulated and unregulated activities), the more material the costs in doubt, and the greater the concerns about market power in the unregulated activity, the greater the likelihood that a single till approach would be appropriate.

Given the uncertainty over how contestability will evolve in water and wastewater, it is difficult to predict how future circumstances will align with these factors. However, given the nature of the assets and activities along the value chains, it is not immediately obvious why there would be substantial common costs. There will likely be some shared assets – for example shared properties – but it must be likely that work to define value chain segments will allocate the great majority of assets to a particular value chain segment. It is also worth noting that the debate in the aviation sector has also shown that it can be difficult to find conclusive arguments in either direction hence there is a tendency towards the status quo. Current arrangements in water focus on the identification and separation of costs and revenues and hence have some similarities with a dual till approach.

Looking at the potential supporting mechanisms identified, the example of the Irish gas market represents a very substantial intervention by the regulator. While the directed tariffs will act to prevent or at least greatly inhibit cost

Price control approaches relating to the unregulated activities of incumbents

allocation issues, this is effectively a by-product of the intervention to help encourage competitive entry by constraining the incumbent's behaviour.

Enhanced regulatory accounting guidelines and the explicit contractual recognition of costs and services should both be capable of reducing or eliminating cost allocation issues. Both approaches should be capable of being scaled to reflect the breadth and materiality of the costs at issue. Neither is a particularly flexible or adaptable solution and hence they are unlikely to encourage innovation. There may also be concerns about the level of transparency that they achieve. However, given the adverse impact that cost misallocations could have on the development of competition, their overall impact on competition should be positive.

6 Price control approaches relating to the unregulated activities of new entrants

6.1 Regulation of future commercial interactions

As discussed in section 2.3, it is possible to envisage many different interactions occurring as a result of the introduction of competition in the water or wastewater value-chains.

From a high-level standpoint, there are three broad types of interactions relating to the unregulated activities of new entrants that future price controls may need to consider:

- **Activities provided to customers or other unregulated companies** – where new entrants provide services to customers or other unregulated companies, the regulated undertaking is not commercially involved and the future price control needs to reflect this.
- **Activities which the regulated undertaking purchases via a bilateral contract** – depending on the way in which competitive arrangements are implemented, future competition “for the market” could result in the regulated undertaking becoming the counter-party to a contract with the provider of an unregulated competitive service.
- **Activities which the regulated undertaking purchases via a market based mechanism** – depending on the way in which competitive arrangements are implemented, future competition “in the market” could result in the regulated undertaking making purchases in some form of wholesale market. For example, with tradeable abstraction/discharge rights or water trading, the regulated undertaking may choose to make a purchase and hence the nature of the costs considered in future price controls may alter.

In the first case, there are no commercial interactions between the regulated entity and the unregulated new entrants and hence the only issue is to ensure that the future price control reflects the changes to the regulated undertakers’ activities. Under both the second and third cases, new forms of regulated/unregulated interactions would occur and the implications of these for future price controls are explored in the next two sections.

In practice, it seems most likely that bilateral contracts would arise in respect of future upstream competition and so the discussion that follows reflects this. In principle market based mechanism could develop at any point in the value-chain where the “competition in the market” model is implemented. Nevertheless, it is

Price control approaches relating to the unregulated activities of new entrants

perhaps easiest to envisage these in the context of tradeable rights or water trading and the discussion below reflects this.

6.2 Implications of bilateral contracts and upstream competition

Existing price controls already deal with situations where regulated undertakers choose to purchase services from unregulated entities using bilateral contracts. Many companies covered by UK electricity, gas and water price controls make significant use of services from contractors for both operational activities and capital programmes. Providing the costs arising from these contracts pass benchmarking comparisons and/or have profit margins removed when the unregulated entities are related parties, the costs are already allowed within existing price controls.

However, upstream competition “for the market” may result in contracts which differ in two potentially significant respects. First, depending on the details of the model of competition introduced, the regulated undertaking may be required to enter into such contracts. Second, where the service being provided, by the new entrant under the contract, is associated with the construction of a new asset it is likely that the entrant will prefer a contract linked to the life of the asset rather than the price control duration. Indeed, since the current *ex ante* price control apparatus effectively gives the regulated undertaking a form of contract which covers the assets lifetime, it is likely to be difficult for a new entrant to compete on an equal footing unless longer term contracts are created.

Box 11 highlights the challenges that have arisen when long-term contracts with third-parties were used to develop new waste treatment assets in both Scotland and Northern Ireland. Despite appearing to be value for money when let (and indeed being let after competitive processes), recent price control reviews now show significant concerns about both the costs and performance being delivered.

Price control approaches relating to the unregulated activities of new entrants

Box 11 – Regulatory treatment of legacy third-party contracts in Scotland and Northern Ireland water

Prior to the recent changes in the organisational status of Scottish Water and Northern Ireland Water their predecessor organisations let public private partnership (PPP) contracts for new water treatment works. The use of such contracts reflected a combination of urgent issues on compliance with discharge standards, and a degree of capital rationing associated with their organisational status.

Staff Paper 5 published by the Water Industry Commission for Scotland (WICS) in 2009 sets out the regulator's views of the costs associated with these contracts which account for more than 10% of annual spending. The paper is clear that while the contracts represented good value for money at inception, it was less certain that this remained the case. Indeed the paper expressed a view that the continuing with the contracts was not in customers' interests. However, in the absence of finance to allow buy-back of assets and/or renegotiation of contracts, there was no alternative but to allow the present costs.

The supporting analysis identified concerns around cost indexation, excessive equity returns, the absence of efficiency incentives and the absence of performance incentives. The Commission confirmed that it expected Scottish Water to use all possible influence to improve matters and created a direct incentive for this to happen by refusing any additional costs to address shortfalls of performance.

Clearly the circumstances around these contracts are rather different from the changes contemplated in England & Wales. It is also evident that with the benefit of this experience, significant lessons can be learnt that could improve new contract structures and hence reduce the risks of poor future contract performance. However, the underlying principles about regulation of costs or services derived from long-term contracts are entirely similar to the sorts of issues that could arise where competition for the market is introduced.

Where a regulated undertaking chooses to enter into a contract, it is likely to mitigate the risks of doing so via some or all of the following:

- cost indexation terms;
- performance incentives/penalties;
- specified re-openers; and
- alignment of the contract duration with the price-control periods.

Ultimately if it chooses a contract that becomes unsuitable, it carries the risks of some costs being disallowed. However, the situation changes somewhat when the regulated undertaking is required to enter into such contracts or when the contracts cover a period longer than one price control cycle.

Price control approaches relating to the unregulated activities of new entrants

In these circumstances, the regulator will almost certainly be required to provide guidance around how the contracts should be established and how the costs and performance delivered will be viewed in future price controls on the regulated undertaking. From a “narrow” price control perspective, the regulator could seek to argue that the contracts should be treated in the same way as those entered into at the regulated undertaking’s own choice. However, the question then arises as to whether the contractual risk mitigation tools that the regulated undertaker wished to apply would encourage competition to the desired extent. There is also at least the potential for such tools to be used to create barriers to entry or additional negotiation costs for new entrants.

Such questions concern the future development of competition and hence are out of scope for this paper. However, it is important to recognise that once contracts are let, future price controls could have little or no influence on them.

The second example relevant to this section illustrates a very different regulatory approach that has been adopted to encourage the development of competition in a new area. Box 12 highlights the example of the new regulatory apparatus developed by Ofgem to help drive forward investment in offshore windfarms. The transmission lines necessary to connect to the onshore grid are effectively sole use assets and will have regulated future income streams. However, a competitive tendering process has been created which allows real competition for the right to finance, construct and operate the lines.

Box 12 – Offshore Transmission Operator (OFTO) licence tenders

New regulatory powers and apparatus have been created to allow Ofgem to award new licences to OFTOs after a competitive tender process. The tenders invite bids for the size of a future regulated income stream, sufficient to allow the financing, construction and operation of the offshore transmission network required to connect offshore windfarms to the transmission grid. The regulated income stream is paid to OFTO as part of the overall Transmission Use Of System charging operated by National Grid.

Subject to passing certain suitability tests, the lowest bidder is awarded a licence for a 20 year period. The licence contains a number of performance standards and incentives designed to protect both the windfarm operator and end customers. The OFTO tender process contains specific start-up criteria to ensure that the new wires are not stranded by the non-construction of the offshore windfarm. However, if the windfarm subsequently ceases to operate, the OFTO licence holder is protected against the effective stranding of his asset as the licenced revenue stream continues. Ofgem have also chosen not to apply ongoing price control regulation to the OFTOs, relying instead on the competition during the tender phase to ensure efficiency.

The regime is relatively new, having only formally gone active during 2009. The first rounds of tenders are, however, well advanced with shortlisted bidders having been announced and the tenders due to complete in 2010. While it remains too soon to draw firm conclusions on the overall success of the new regime, the initial signs are encouraging with significant interest having been generated in the first tenders.

Price control approaches relating to the unregulated activities of new entrants

For the purposes of this paper, the relevance of the OFTO example is the choice by the regulator to adopt a different means of influencing “competition for the market”. Ofgem have decided not to use future price controls to influence costs but have instead relied on a competitive tender process to deliver an efficient outcome. This is one means by which the challenges associated with required long duration contracts discussed above, could be overcome.

6.3 Implications of water abstraction trading

If future changes to abstraction regimes were to result in the creation of tradeable abstraction rights or bulk water trading, this may create some specific challenges for future price controls. Abstraction/water costs may become a larger proportion of total costs than in the current environment. At the same time, these costs may become less predictable and/or more volatile, both of which pose challenges for a typical periodic price control process. Costs that become less predictable are more difficult for companies to forecast and for regulators to benchmark. Increased volatility also makes it more likely that the mechanisms to deal with exogenous risk of the type discussed in section 4.3 will need to be applied.

It is also possible that the existing incumbents may be dominant in any new abstraction rights markets. If this is the case, there may be a need for the use of some sector specific regulation to control for this. For example, regulatory arrangements covering the water abstraction markets in Australia include water market rules which explicitly relate to irrigation network operators. By virtue of their control over water delivery and the significant volumes of water they hold these operators can unilaterally affect market outcomes (see text boxes 15 and 16 in chapter 8 for further details).

As the proportion of abstraction/discharge costs covered by tradeable mechanisms increases, it may also become necessary to change the nature of the price control process. In section 5.3, box 7 described some of the challenges around the regulation of partial retail competition in England & Wales electricity during the 1990s. Ofgem restructured the price controls applying to the Public Electricity Suppliers to create separate price controls on distribution network activities and regulated retail activities. The price control on retail adopted a standard price control approach in some areas, using comparative benchmarking on direct retail costs such as billing and metering services. However, an alternative approach was developed in respect of the costs of purchasing wholesale electricity.

Electricity was traded via a compulsory wholesale market meaning that it became almost impossible for companies to purchase at a price consistently lower than the market price.

Price control approaches relating to the unregulated activities of new entrants

The focus of regulation therefore shifted to monitoring any premia against market prices that was paid, rather than the level of costs overall.

6.4 Summary and observations

One key observation from the examples and associated commentary in the previous sections is the extent to which the regulator's options under a price control may be constrained by decisions taken in the set-up of competition or by previous contractual decisions. Indeed, there is a risk that the contractual frameworks developed may mean that the regulator has only two effective options – provide funding for the costs being incurred by the regulated undertaking, or provide funding for the costs that would be incurred to renegotiate/terminate contracts that no longer represent value for money.

In principle, it may be possible to mitigate the risks associated with such a scenario by seeking to include some degree of flexibility in contractual arrangements. This will require careful consideration of the need to encourage new entry – for example by ensuring that entrants do not perceive that flexibility creates an unacceptable risk of future stranding – and the need to continue to protect customers by seeking to pass value for money tests in all price controls. There may also be an important choice around the extent to which regulatory intervention is required, to create the desired flexibility, or whether it can be left to new entrants and regulated undertakings to conduct the necessary negotiations in a timely and efficient manner.

Given the number of regulated undertakings and the risks that a new entrant would require different negotiations with each, there may also be a case for the regulator to sponsor (or mandate) the development of standard contracts forms. Such contracts might also create a benchmark making it easier to check whether an incumbent has abused a dominant position in the initial negotiations; and make any benchmarking in future price controls somewhat easier. In order to prevent barriers to innovation it will be important to ensure that the standard elements are limited and that “outcomes” are specified rather than mandating how these are achieved.

Price control approaches relating to the unregulated activities of new entrants

7 Pricing rules

In situations where competition is emerging within a sector, previously served by a vertically integrated monopoly, less comprehensive pricing rules can be adopted. These may take the form of explicit rules which constrain the pricing of the incumbent. Pricing rules can be used as alternatives or complements to any existing *ex ante* price controls.

Some of these pricing rules represent alternative mechanisms for capping prices, while some also act as a price floor preventing an incumbent from engaging in predatory pricing.

Although they can involve periodic reviews, they are most typically applied on a one-off basis to fix prices. Therefore, unlike the *ex ante* price controls described in chapter 3 they are not always based on an estimates of the efficient costs of providing the service.

In this section we describe the following pricing rules:

- top-down or retail minus approaches;
- pegged tariffs;
- default tariffs; and
- safeguard tariffs.

We then consider their strengths and weaknesses in the context of key challenges facing the sector.

Various pricing rules are used by regulators in the UK and abroad. Typically in utility industries that have had some segments of the value chain opened up for competition. For example, in the telecommunications, energy and postal sectors. Pricing rules of the forms listed above are less common in the water industry given the low level of contestability in the sector. However, some of these approaches have been used in the water regulatory regime in both the UK and Australia.

7.1 Key pricing rules

7.1.1 Top-down or retail minus approaches

With contestability in the retail and upstream segments of the market a top-down or retail minus based control can be used to determine the price(s), paid by rivals, for an incumbent's wholesale products and/or its network distribution services (the 'network access price'). This type of approach represents an alternative to setting network access prices using a bottom up estimate of the costs of these services as described in section 3.3.3.

Under a top-down or retail minus control the regulator determines:

- a reference retail price for the service provided by the incumbent, against which a rival will be competing;
- subtracts from it the costs associated with the contestable segment of the supply chain (which will, as a result of entry, be avoided by the incumbent); and
- adds any additional costs incurred by the incumbent in providing access²⁷.

Significant differences in retail minus based approaches can arise from using different definitions for the costs subtracted from the retail price. For example, some regulators have used long-run concepts of costs while others have used short-run cost estimates. In the case of the retail minus approach used in the postal sector the subtracted amount has not been solely cost based (see text box 14).

A retail minus price control essentially sets the margin for rivals seeking to access a segment of the vertically integrated supplier's operations. Therefore it defines the scope for entry into the contestable segment. In other words if a rival can provide the contestable service at a lower cost than the regulator's estimate of the incumbent's costs then it can compete in the market.

A retail minus based pricing rule have been applied by water undertakers when they set their access prices (for combined and wholesale supplies). They have also been applied in the wastewater sector in Australia and in the telecoms and postal sectors.

7.1.2 Pegged tariffs

A regulator can use pegged tariff pricing rules to formalise a competitive constraint in a market where competition is emerging. Pegged tariffs can also be used to prevent a vertically integrated firm from foreclosing certain segments of the market and engaging in predatory margin squeeze. They do this by expressly pegging the price charged in a non-competitive segment to a related price in the competitive segment using an explicit legislative rule. In other words, a firm can only raise or lower its price in the non-competitive segment if it does so in the competitive segment and vice versa.

²⁷ In most cases regulators seek to apply the efficient component pricing rule (ECPR) in setting a top down access price control. The ECPR states that an access price, that cover the cost of providing access, plus the profits from any retail sales lost as a result of providing access, will ensure that rivals can only enter the market if they are more efficient in providing the contestable functions than the incumbent.

These pegged tariffs also work to control the level of price differentiation in the market. Therefore, regulatory intervention of this form may also be associated with a public policy motive of encouraging equality — in terms of the price and service offering provided to customers buying similar products. Pricing tools which peg tariffs include benchmark and tied tariffs.

Benchmark tariffs

Benchmark tariffs are based on the prices set in other markets or by other suppliers. Therefore, it requires related markets or other firms providing similar products or services to exist. If used with an efficiency objective in mind the regulator must be sure that the benchmark markets/suppliers are sufficiently related to the regulated services/firm and that the benchmark tariffs are efficient.

Benchmark regulation is used by Ofgem to regulate the prices paid for Independent Gas Transporters (IGT) services. IGTs operate local gas transportation networks, connected to the gas distribution network. Ofgem ensures that customers connected to the IGT network pay a tariff close to that paid by the customers connected to the gas distribution network.

Something similar to a benchmark tariff was included in the requirement, placed on the four major clearing banks in the UK, to provide interest rates for SMEs current accounts at a minimum of the Bank of England base rate less 2.5%. This requirement formed part of a transitional undertaking introduced following a Competition Commission inquiry in 2002²⁸. This was removed in 2007 after an OFT review showed that the market had become more competitive.

Tied tariffs

Tied tariffs create an explicit link between the prices charged by an operator across different customer groups, services or geographic zones. Pegging the prices in this way controls the level to which the firm can price discriminate.

Ofgem uses a form of tied tariffs to control prices for non-direct debit customers (where competition was considered to be weak) by reference to prices for direct debit customers (where competition was considered to be more effective). The premium applied to consumers using different modes of payment is therefore capped. This approach was adopted following an inquiry which highlighted that the difference in tariffs between customer paying quarterly and by direct debit was around £80 in 2008. This regulatory intervention may also have been motivated by equity objectives, as the non-direct debit customers could be identified as a more vulnerable customer group.

²⁸ http://www.offt.gov.uk/shared_offt/business_leaflets/general/offt620.pdf

A tied tariff control is also used to control the level of termination fees charged by irrigation water operators in Australia. These fees may be payable when a customer irrigator chooses to cease supply. Under the water charge rules²⁹, termination fees are capped at 10 times the individual customers' annual fees for distribution services, except where the customer irrigator and the operator have knowingly contracted away from this arrangement.

7.1.3 Default tariffs

A default tariff is a price limit applied to a single specific product or service within a market. This price is intended to act as a marker or binding constraint on other related prices in the market.

It would usually apply to the basic service demanded by the majority of customers. By imposing a price limit on this product the regulator is able to leave other products unregulated, on the basis that the default tariff will constrain exploitative behaviour in these other segments.

Default tariffs are often difficult to distinguish from safeguard tariffs (see section below) which are set to protect customers against excessive price rises. The key difference tends to relate to the fact that the default tariff are more likely to be costs based even though they may apply to only a limited set of the available products and services.

7.1.4 Safeguard tariffs

A safeguard tariff is set to provide a safeguard to customers against excessive price rises, and to limit exploitative behaviour during a transition to a more competitive situation. It may be set slightly above the cost reflective level and would not necessarily be expected to bind outcomes in the market. Given it is not intended to bind it is best used when there is less risk of costs increasing over the regulatory period. Typically the setting of a safeguard tariff would involve less scrutiny of costs by the regulator than under an *ex ante* control.

A safeguard tariff is sometimes accompanied by controls intended to enable all customers to access the safeguard service.

Safeguard tariffs are used by the Water Industry Commission for Scotland. In the contestable retail market, it sets the maximum price that a retailer can charge to non-households customers. The rationale for setting this tariff is to ensure that customers can benefit from competitive prices below the safeguard tariff while customers are protected from excessively high tariffs. These safeguard tariffs are

²⁹ Water Charge (Termination Fee) Rules 2009 made under section 97 of the *Water Act 2007*.

set using an RPI-X rule³⁰. Safeguard tariffs have also been used in the regulation of telecommunications access charges in the UK.

Even though they identified a number of issues with safeguard tariffs these have also been applied by the Competition Commission in non-network industries (see text box 13 below).

Box 13 – UK Classified Directory Advertising Services

Yellow Pages is the major provider of Classified Directory Advertising Services (CDAS) in the UK. The extent of competition in the CDAS market has been subject to a number of investigations: by the MMC in 1996, by the OFT in 2001 and most recently by the Competition Commission in 2006³¹. As a result of these investigations price cap controls have been applied to the pricing of Yellow Pages adverts. These price controls effectively operate as **safeguard price caps**.

Yellow Pages are published by Yell Group. It provides a set of local directories across the UK. The directories are provided free of charge to users and revenue is raised by charging advertisers. The price of the advert depends on the size of the advert and the circulation of the specific directory. Yellow Pages faces some (albeit limited) competition from Thomson directories and the BT Phonebook.

The price caps were applied to each product separately. For example, the remedies imposed in 2001 involved an annual RPI-6% on each product. There was no provision for Yell to rebalance prices for products within an overall cap. The level of the price control was **not based on a building block assessment** of costs. It was though set with the aim of gradually reducing what was assessed to be an excessive level of profitability. It was aimed at protecting the interests of customers while at the same time supporting the introduction of competition.

Under the remedies Yell was allowed to introduce new products and alter existing products subject to some simple rules. For example, although prices depended on the size of circulation, it did not follow a simple linear relationship. The price per circulation was higher for the smaller directories. Yell was allowed to change the size of directories but the new prices could be no higher than the prices of existing directories that were closest in size to the new directory. This rule was relatively simplistic but was easy to enforce and monitor.

When the Competition Commission investigated the market in 2006 they identified a number of issues with the existing remedies.

- The price cap limited flexibility. The remedy discouraged price cuts below RPI-6%, as this would set a new lower price level. The RPI-6% always applied to the previous year's price. This was considered to incentivise promotions as opposed to price cuts, the impact was not considered to be material.

³⁰ <http://www.watercommission.co.uk/UserFiles/Documents/Final%20Determination%20document.pdf>

³¹ Competition Commission, *Classified Directory Advertising Services market investigation*, December 2006.

- The remedy incentivised high pricing of new products. The remedy did not control the pricing of new products in their first year, although the price cap applied in subsequent years. The Commission considered that when colour adverts were introduced they were priced at a premium that was not justified in cost terms. As a result the remedy distorted incentives for the introduction and pricing of new products.
- The Commission commented that Yell had undertaken significant re-scoping of its directories and that this could have been linked to the nature of the pricing remedies.

Overall, it appears that this pricing rule resulted in strategic behaviour by the incumbent. In particular the rule appeared to distort incentives relating to the introduction and pricing of new products. However, the drawbacks with this approach should be set against the simplicity and low regulatory burden of the rule and the fact that the Competition Commission expected that the incumbent's behaviour would ultimately be constrained by the emergence of competition.

7.2 Strengths and weaknesses of pricing rules

Pricing rules are typically applied in situations where competition is emerging within a sector such that the rationale for more comprehensive forms of price regulation may be reduced.

Although they can involve periodic reviews, they are most typically applied on a one-off basis. The fixed nature of the tariffs set by pricing rules means the control does not take account of any changes in capital and operating expenditure over time. This has a strong affect on pricing rules' relative strengths and weaknesses which are outlined below.

- **Strong incentives for productive efficiency** — given there is often a greater disconnect between the firms prices and its costs. Any profitability arising from a reduction in costs will stay with the firm. This can act to replicate the working of a competitive market and create strong incentives for productive efficiency.
- **Potential for allocative inefficiency** – the fixed nature of the tariffs means that prices will not fall below the level set by the pricing rule even where the firm has made efficiency improvements. This was recognised as a weakness of safeguard tariffs by the Competition Commission (see text box 13).
- **Limited adaptability** — given they are fixed there may not be an agreed mechanism with which to update the pricing rule to reflect market changes, cost efficiencies or to expand the scope of the control. This means that over time the pricing rule will become less appropriate.

Pricing rules

- **Inflexible** — retail minus price controls and pegged tariffs in particular rely on the existence and efficiency of the tariff to which they are linked. If used with an efficiency objective in mind the regulator must be sure that the reference tariff (in the market, or of the supplier) is sufficiently related to the regulated service/firm. This tariff must also be efficient. If the tariff is too high because of inefficiencies these higher prices will be passed on to the linked price.
- **Lower regulatory burden and implementation costs** — where these controls are not associated with periodic cost assessments, they potentially impose fewer costs on both the regulator and regulated firm when compared to *ex ante* price and revenue cap regulation. For example pegging tariffs to comparator prices can be a proportionate response where information is limited, and the costs of undertaking detailed efficiency studies to establish cost allowances and performance targets outweigh the potential benefits to consumers. This might also be relevant where the regulated network is very small. In general they may also be easier to enforce and monitor.

We further consider in the following sections whether or not the various pricing rules controls:

- promote efficient competition or are compatible with competition developing in different segments of the value chain; and
- provide incentives for efficient investment and scope for innovation.

7.3 Compatibility with developing retail and upstream competition

In considering whether the various pricing rules are compatible with the development of efficient retail and upstream competition we have looked at the implications arising from their use in a number of situations (based on the future paths described in section 2.4.2).

First, we have considered the implications of using pricing rules in the presence of full and partial retail competition; and during any transition (see section 7.3.1).

Second, we have considered whether top down or retail minus pricing rules have a role in setting network access prices in order to prevent the incumbent limiting rivals' access to the bottleneck infrastructure it controls or wholesale services it provides (see section 7.3.2).

We have considered the applicability of pricing rules to an incumbent's upstream operations where there is competition. This requires a clearer vision of the form any competition may take. In particular it would depend on whether the incumbent was selling upstream water or wastewater services directly.

7.3.1 Using pricing rules to control retail prices in the presence of retail competition

With full and effective retail competition

As discussed in relation to *ex ante* controls, in general, pricing rules are not suitable for controlling retail prices where there is full and effective retail competition. That is unless they are intended to achieving some other objectives such as greater pricing equality.

In a transition to full competition

Pricing rules — default and safeguard tariffs in particular — may be effective as transitional controls in advance of de-regulating an incumbent's retail operations. When used in this way they may give the regulator time to observe the efficiency of the retail market as it emerges. This would provide greater certainty to the regulator (in terms of either preventing excessive price rises or predatory pricing behaviour) during any transition to full competition.

With partial competition

Pegged tariff pricing rules rely on the presence of emerging or partial competition in order to function.

However, a pegged tariff rule may not be compatible with scenarios where customer contestability varies. For example with a partially contestable retail market an operator's tariffs in the non-contestable household segment could be pegged to its tariffs in the contestable non-household segment. However, there is a risk that this may be ineffective as the operator could choose to increase prices in both markets. There would be incentive for it to do so if, by raising both prices it is able to recover sufficient revenue from household customers to cover the fall in revenue from non-household customers (who may choose to switch away). As an alternative a market price (for non-households) could be used. However, there are likely to be many practical issues associated with defining the market price for the purposes of the control.

That said these rules may be appropriate in highly specific circumstances where there is full contestability but less effective competition across customer segments (as per the tied tariff rules applied by Ofgem for controlling prices for non-direct debit customers by reference to prices for direct debit customers).

They may also be relevant for determining prices which represent a relatively small proportion of an operator's revenue such that it would have no incentive to change its pricing structure in the competitive segment of the market. This is the case in relation the tied tariff rule used to control the level of termination fees charged by irrigation water operators in Australia.

Pricing rules

7.3.2 Setting network access prices using a top down or retail minus based approach

Of the pricing rules presented, only the top down or retail minus based approaches are intended to be used for determining network access prices. As we discuss below the strengths of this type of control largely arise when used in the context of partial or emerging competition.

A key strength of retail minus price controls relative to bottom up access price controls is that they **give the regulator certainty in addressing two regulatory concerns** that may arise as competition emerges. Namely, they simultaneously prevent a vertically integrated incumbent operator:

- from foreclosing a market by raising network access prices; and
- squeezing the margins of rivals.

As upstream competition emerges particularly where this occurs in only parts of the market, top-down retail minus controls may have some advantages over bottom-up *ex ante* network access price controls³².

- **They can be more proportionate** — Retail minus approaches may impose a lower regulatory burden and fewer administrative costs for the regulated firm and the regulator.
 - Capping a network access price using a bottom up *ex ante* control would require estimation of the costs associated with providing the non-contestable network (plus in some case upstream) services. In some circumstance this data may not be easily or readily available, making retail minus approaches simpler to apply on a one off basis.
 - Retail minus network access price controls also enable the maintenance of any desirable cross-subsidies. This is because the structure of the network access prices is derived from the retail price. Under a bottom-up approach these would have to be expressly defined and obligations for maintaining these place on the new entrant. Otherwise a new entrant could cherry-pick the profitable customers, which would ultimately lead to any cross subsidies being unwound. This would increase the costs of the regulatory regime.

³² A top-down access price is an approach that takes the retail prices paid for the service and deducts the avoidable costs of providing the downstream service to calculate an access price. In contrast a cost-based approach is a 'bottom-up' approach that models the costs of the various elements necessary for providing the downstream service.

- **They promote competition (which will be efficient where appropriately estimated)** — Where the access price and reference retail prices are subject to separate regulation (i.e. potentially where the price control is set at different times) there is a risk regulators may set inconsistent access and retail prices. If this occurs inefficient entry may be encouraged. A cost based ‘retail-minus’ approach would help prevent this risk of ‘regulatory margin squeeze’. Also where competition emerges unexpectedly it is possible to imagine a network access price being required before any disaggregation of the regulatory regime. Therefore, retail minus based approaches reduces the risk of any inconsistencies developing between the regulated retail and network access prices. This was one of the reasons the ACCC adopted a top-down approach in its wastewater determination (see text box 14).
- **They are consistent with the use of tariff structures that encourage water use efficiency** — Retail minus network access price controls enable the maintenance of any desirable retail tariff structures. This can be advantageous when using the tariff structure to promote water use efficiency.

Consistent with the weaknesses of pricing rules in general retail minus access price controls are not particularly adaptable or flexible. In fact they can only be applied in certain circumstances and so can easily become redundant.

For efficient retail markets to develop firms must be competing on a level playing field. This requires that a common, cost based, network access price be charged to all retailers for the incumbents network services. A cost based access charge can be estimated using a retail minus approach, however, it requires that both the retail prices and the margin deducted be strictly cost-based.

This requires a regulated retail price. Otherwise, even with full and effective retail competition, the incumbent could still set its retail prices higher than costs in order to increase its network access price³³. This would not affect its share of the retail market as the increased network access price would also increase its competitors’ costs.

This means retail minus network price controls are most compatible with circumstances where there is partial competition and where an *ex ante* retail price

³³ In a de-regulated competitive market a vertically integrated incumbent could choose to set its retail prices higher than cost. Under a retail minus access approach based on the incumbent’s retail price this would feed through to higher access prices. Given the lack of competition in network segment this increase in access prices could be sustained. Competition in the retail segment would not affect this outcome, as higher access prices would feed through to competitor’s costs such that they may be forced to raise retail prices, enabling the incumbent to sustain any excessive price rise. Alternatively a top-down approach could be based on the market price, which with a competitive retail market would be cost reflective. However, this market price would be difficult to define for the purposes of the control and is therefore unlikely to be practical.

control remains in place. For example, where there is retail competition for non-household customers only such that an *ex ante* control remains for household retail prices³⁴. Or where there is either full or sporadic upstream competition provided a suitable regulated reference retail price remains.

Determining the level of the control through the ‘minus’

The effectiveness of retail minus network price controls in promoting efficient competition also depends on whether the costs subtracted from the reference retail price have been appropriately estimated. The approach essentially defines the scope for entry into a contestable segment through the ‘minus’. In other words if a rival can provide the contestable service at a lower cost than that estimated by the regulator then it can compete in the market. This makes the definition of costs problematic and is one of the major weaknesses of retail minus approaches.

Where the ‘minus’ is not cost based inefficient entry – either too little or too much – can result. The top-down approach used in the postal sector is not solely cost based. This has raised concerns about the efficiency of the entry that has occurred (see text box 14).

Even when cost based, different definitions for the ‘minus’ can lead to very different outcomes. Regulators have estimated the ‘minus’ costs using both long-run and short-run costing concepts (see text box 13). The effect of the costing approach adopted is more pronounced when it involves high value assets. Therefore, this is particularly relevant to the use of top-down access price controls with upstream competition, particularly if major investment is envisaged in the future.

In this case forward looking long-run cost estimates will be far greater than short-run cost estimates. This would lead to a substantially higher ‘minus’ thus promoting new entry and competition for the provision of this new investment.

In general, forward-looking estimates of costs provide incentives which are more consistent with competitive markets. As firms within those markets are likely to set prices based on expected market conditions, rather than on the basis of the historical costs incurred. As such, forward-looking estimates can promote more efficient entry and therefore competition. As discussed in relation to *ex ante* controls this increased exposure to competition comes with increased risk of asset stranding and therefore potentially higher financing costs.

³⁴ The regulated household retail price could then be used to determine a common access price for both service segments.

Box 14 – Effectiveness of different top-down access pricing approaches

UK postal sector

Postcomm’s 2006 price control currently regulates Royal Mail’s retail prices under an RPI-X framework. As part of this price control Royal Mail’s wholesale access prices are capped by a retail minus access price control. This controls the size of the headroom—the difference between retail prices for end to end services and the access prices paid by rivals. The fixed headroom levels in the licence were specified as a percentage of the retail prices. Although costs were considered these levels were largely based on access pricing outcomes previously negotiated between Royal Mail and various access seekers.

Postcomm is currently reviewing this regime given concerns about the efficiency of the entry that has occurred (given the way in which the ‘minus’ has been determined). It is thought that this has been more heavily influenced by the regulatory instrument rather than by genuine competitive advantage on the part of new entrants. In particular, concerns have been raised regarding the level and pattern of entry and the ability of the control to be adapted to reflect market changes, cost efficiencies or to cover new products.

Postcomm was aware when setting the current retail minus access pricing regime that it could lead to some inefficient entry. However, it noted that the purpose of this control was to provide some certainty and predictability for new operators and protect them against the risk of margin squeeze by Royal Mail³⁵. This implies that the retail minus access price control was largely intended to be transitional and to apply in the context of uncertain, emerging competition.

However, since originally setting the access price control, competition has now grown significantly³⁶. This change is likely to have played a significant role in Postcomm reconsidering the suitability of a retail minus access price control. Greater certainty around the effectiveness of competition reduces the importance of retail minus access price control’s relative strengths (when compared to a bottom-up *ex ante* controls).

UK water sector

Ofwat’s guidance, developed in accordance with the cost principle³⁷, specifies a retail minus based approach for determining the access price water undertakers may charge new entrants³⁸. The costs that are avoided or reduced, or are recoverable in some other way, other than from the Company’s other non-eligible customers, (ARROW costs) are subtracted from the retail price.

³⁵ Review of Royal Mail’s pricing flexibility and the level of access headroom (the ‘Interim Review’ of the price control), A Decision and Direction by the Postal Services Commission, January 2008.

³⁶ Frontier Economics (2010) “Advice on access 2011”, a report prepared for Postcomm, June 2010.

³⁷ The Cost Principle is specified in the Water Industry Act (1991) Section 66E

³⁸ Ofwat, “Water Act 2003, Water supply licensing, Guidance on access codes – version 6”

The Cave Review noted that the current interpretation of the costs principle effectively eliminates competition and market entry³⁹. The Review noted that “by focusing on short-term avoided costs, the costs principle fails to offer alternative providers a fair return for the services they offer, although it also ensures that total costs do not rise as a result of entry”⁴⁰. Cave suggests that this may prevent potentially competitive long term entry and protect the incumbent from competition, and as a result represents a barrier to entry.

Australian wastewater sector

The Australian Competition and Consumer Commission (ACCC) applied a top-down approach in its determination of the access pricing arrangements that would apply in the Sydney wastewater network.

It specified that the costs the incumbent could avoid in the long-run (the avoidable costs) should be subtracted from the regulated retail prices. Avoidable costs were defined as the costs Sydney Water (the vertically integrated incumbent) would otherwise incur in the provision of sewerage services that could be avoided if it completely ceased provision of the relevant contestable components of providing sewerage services. The costs were to be estimated using a building block approach. This would include the capital costs associated with infrastructure assets unlike the Ofwat approach. The opening valuation of the assets was based on a forward-looking approach with reference to their current replacement cost.

One of the arguments put forward by the ACCC for adopting a top down approach related to the fact that retail price were separately regulated by the state regulator IPART. The ACCC was concerned about deterring efficient entry, or creating inefficient entry as a result of any inconsistencies arising between the level and structure of the regulated retail prices and access prices.

7.4 Consequences for investment and innovation

The fixed nature of pricing rules means that any changes in capital and operating expenditure will not be taken into consideration. This can place greater risk on individual firms and may result in an increase in investor perceptions of risk. This can lead to a higher cost of capital (and therefore financing cost) when compared to more comprehensive *ex ante* price controls. Hence, these approaches may be most suited to situations where there is less exogenous risk of costs increasing over the regulatory period.

That said they may still provide strong incentives for investments that generates efficiency savings. Given there is often a greater disconnect between the firm’s

³⁹ Professor Martin Cave (2009) “Independent review of competition and innovation in water markets: final report”, April 2009, p69.

⁴⁰ *ibid*, p46.

prices and its costs any profitability arising from efficiency savings by the firm will stay with the firm.

Furthermore, pricing rules by de-linking costs and revenues do not incentivise expenditure of any particular form, therefore, they may be more supportive of innovative solutions.

7.5 Summary

Pricing rules are typically applied in situations where competition is emerging such that the rationale for more comprehensive *ex ante* price controls may be reduced.

Pricing rules constrain the pricing conduct of the incumbent. Often they can act as both a price cap and a price floor which means they can simultaneously prevent excessive and predatory pricing.

Unlike the *ex ante* price controls described in chapter 3 they are not always based on periodic assessments of efficient costs of providing the service. As a result they can provide strong incentives for productive efficiency. They may also have a lower regulatory burden and implementation costs when compared to *ex ante* controls.

However, they may not lead to allocatively efficient outcomes and are not particularly adaptable, given their fixed nature, and so can easily become redundant. Also, they may only be applicable in specific circumstances, particularly when they rely on the existence and efficiency of a tariff to which they can be linked.

Compatibility with retail and upstream competition

Pegged tariffs expressly link the price charged in a non-competitive segment of the market to a related price in a competitive segment using an explicit rule. In general they are not suitable for controlling retail prices, where there is effective retail competition, unless they are intended to achieve a broader non economic objective associated with removing pricing discrimination. They could be used in a partially contestable retail market in some specific circumstances. Although it is not clear that they would be effective if used to peg non-contestable household prices to contestable non-household prices, as there is a risk that the operator could choose to increase prices in both markets.

Default and safeguard tariffs may be effective as transitional measures in advance of the de-regulation of an incumbents retail operations. When used in this way they may give the regulator time to observe the efficiency of the retail market as it emerges.

Top-down or retail minus access price controls could have a role in controlling the network access price of a vertically integrated incumbent

Pricing rules

operator. Although only where there is a regulated retail price. The effectiveness, of these approaches, in promoting efficient competition depends on whether the costs being subtracted from the reference retail price have been calculated appropriately. The complexity associated with doing this is a major weakness of retail minus access price controls.

That said that have some advantages over bottom-up *ex ante* access price controls when applied in the context of emerging or partial competition. Namely they:

- can be more proportionate and impose a lower regulatory burden;
- promote competition; and
- are compatible with retail tariff structures being used to encourage water use efficiency.

Consequences for investment and innovation

The fixed nature of these pricing rules means that they do not take account of any change in costs. This can increase the cost of financing under these controls when compared to more comprehensive *ex ante* controls.

That said they may still provide strong incentives for investments that generates efficiency savings. Given there is often a greater disconnect between the firm's prices and its costs any profitability arising from efficiency savings by the firm will stay with the firm.

8 Other lighter touch approaches

In addition to pricing rules, other ‘lighter touch’ regulatory approaches can be used address concerns about the market power of a dominant incumbent operating in the market or a segment of the value chain. These are often used for transitional purposes to help foster competition and give the regulator greater certainty in this regard.

These approaches may be used to control both prices or the broader non-pricing conduct of the incumbent as it interacts with new entrants and other unregulated businesses.

These approaches are more relevant to situations where there is some level of contestability but where concerns around market outcomes remain. As a result regulators may opt for less comprehensive forms of regulation which do not presume misconduct.

This section describes the following regulatory approaches:

- non-discrimination obligations;
- disclosure requirements;
- price monitoring; and
- negotiation and constructive engagement processes.

We then consider their strengths and weaknesses in the context of key challenges facing the sector.

8.1 Non-discrimination obligations

Non-discrimination obligations (NDOs) do not regulate the level of an operator’s charges. Instead they are concerned with the extent to which operators can discriminate across customers in terms of the prices or services offered.

Typically they state that, except in certain circumstances, an operator must not discriminate:

- between the services they provide and the prices they charge; or
- in the way in which they determine prices between customers, or groups of customers.

This tool can be used where there is a vertically integrated supplier with a sufficient level of accounting separation or where there is some common ownership of operators across vertical segments of the supply chain. This is to prevent an operator that controls access to a piece of essential infrastructure

from foreclosing a contestable market. Obligations of this form have been used in the UK postal and rail sector (see the text box 15 below).

NDOs can also be used where a firm has market power but where a segment of its customer base has significant countervailing power. In this circumstance these customers may be able to negotiate efficient pricing outcomes. While the firm may still be able to generate monopoly profits from consumers with less ability to negotiate, the regulator can use the deals negotiated by the ‘powerful’ customers to control the offering made to the ‘powerless’ customers. In these cases NDOs may be a more proportionate response than other regulatory approaches. That said, NDOs may adversely affect the level of innovation in this related market where any negotiated gains are passed on to rivals also. This was noted by the Competition Commission in its Rolling Stock Leasing market investigation.

Non-discrimination clauses can be used for reasons of equity. However, price discrimination in itself is not necessarily inefficient. Therefore, meeting equity objectives can come at the cost of efficiency.

NDOs can also be used to regulate the operational interactions of a regulated incumbent with its unregulated rivals. The arrangements for water retail competition in Scotland (summarised in Annexe 5) highlight the number of interactions that the incumbent may be required to facilitate. Failure to meet the required performance standards, or the provision of different service standards to different industry participants, can impact on operational costs and the development of retail or upstream competition. In some cases, these may reflect operational inefficiency rather than any calculated decisions on the part of the incumbent. However, NDOs and service standards can also be effective in dealing with these instances.

Box 15 – Examples of non-discrimination obligations

UK Postal sector

Royal Mail’s licence includes conditions which require that it provide access to its delivery operations on terms no less favourable than its retail collection business receives and that it does not unduly discriminate between persons having access to its postal facilities⁴¹. Royal Mail has ringfenced its wholesale delivery business, therefore, these conditions are intended to prevent Royal mail foreclosing the contestable mail collection market.

Rolling Stock Leasing market investigation

The Competition Commission (CC), as a result of its Rolling Stock Leasing market investigation⁴², proposed the removal of provisions in the Codes of Practice that prevented rolling stock leasing companies (ROSCOs) from discriminating between the

⁴¹ Condition 10 and 11 of the licence granted to Royal Mail under the Postal Services Act 2000

⁴² http://www.competition-commission.org.uk/rep_pub/reports/2009/fulltext/546.pdf

Other lighter touch approaches

terms of leases offered to train operating companies (TOCs). The CC found that a TOC's incentive to negotiate with a ROSCO over lease rentals was limited partly because of the way in which the non-discrimination requirements had been applied, which meant that a TOC could not achieve a competitive edge in franchise bids, since any negotiated gains on a particular fleet will also be passed on to rivals.

Australian water market rules

The Australian water market rules were put in place to govern the service and charging arrangement of rural water service providers. These providers are typically co-operative. They operate water distribution networks but they also act as agents for customer irrigators who are considering selling their water abstraction rights in the water trading market. As a result they have an incentive to prevent customers selling their water rights in order to ensure they keep receiving fees for their delivery services. The water market rules include non-discrimination provisions relating to service terms⁴³. These are designed to prevent the water operator from restricting an individual from selling their water abstraction rights in the market by downgrading the delivery service they receive, after the sale, for any remaining rights. As a result an operator cannot discriminate in the service terms they offer to water customers who have or are considering selling their abstraction rights vs. those that have not.

This provision assumes that the service provided to customers who have not sold their abstraction rights are sufficiently controlled by the fact that they are majority members of the co-operative or otherwise voting shareholder. In which case the level of service and price they are charged should be controlled by the incentives present in a co-operative.

8.2 Informational remedies and disclosure requirements

At a high level, informational remedies and disclosure requirements can be used to:

- make consumers more aware of how to exercise choice and address issues with suppliers;
- improve the information on price and quality available to consumers (by increasing the quantity of information or its transparency); and/or
- make them more able to raise issues around anti-competitive conduct or operator non-compliance with other regulatory arrangements.

This may lead to consumer making better choices and the regulator being more aware of anti-competitive conduct or non compliance. These approaches are typically employed by competition regulators in markets where there are consumer side market failures — for example problems of incomplete,

⁴³ *Water Market Rules 2009* made under section 97 of the Water Act 2007

asymmetric information or behavioural biases — to prevent consumers from making uninformed decisions.

Information and disclosure requirements can evolve significantly over time. For example, after the introduction of retail competition, Ofgem began publishing occasional fact-sheets with tariff comparisons for all electricity and gas suppliers. This service was then replaced by accredited price-comparison websites, and such sites have themselves evolved commercial business models offering comparison services over a broad range of products and services.

More recently, following their Energy Supply Probe enquiry on 2008, Ofgem has placed new licence conditions on all suppliers requiring them to provide consumers with additional tariff and consumption information, and reminders about consumers' ability to switch supplier and how to do so. Similar approaches have also been used in the regulated water sector overseas (see text box 16 below).

Information disclosure can be an also important feature of any wholesale markets that develop. For example, the Balancing and Settlement Code developed when the New Electricity Trading Arrangements (NETA) were introduced in the UK in 2001, contained more significant provisions relating to the publication of market information than existed under the previous electricity pool.

Box 16 — Australian water market rules

By virtue of the legal arrangements in Australia, irrigators do not in all cases hold their water abstraction rights directly. Instead operators may hold these collectively on behalf of the irrigators to whom they provide water delivery services. In these cases the operator's cooperation is required if an irrigator wants to trade their water abstraction right. The Australian Competition and Consumer Commission (ACCC), one of Australia's water sector regulators, received complaints about operators restricting water trade given the potential implications of outward sales on their water delivery revenue.

Therefore, Rule 7 of the Australian water market rules requires operators to provide customers with details of their rights, the processes for trading water and a copy of the trading rules to which the operator must adhere. This is in order to make these customers more informed and aware of their rights, but also more able to identify anti-competitive conduct when it occurs.

8.3 Price monitoring

A price monitoring regime is a tool often used in combination with other regulatory approaches as part of a compliance strategy. However, it can also be used in its own right, particularly when considering a transition away from or towards a more stringent *ex ante* regime.

Price monitoring can increase efficiency where there is no substantial market power, or where this power is constrained. In particular it may lead to:

Other lighter touch approaches

- lower compliance costs;
- reduced risk of regulatory failure; and
- increased commercial negotiations which may in turn increase efficiency.

However, price monitoring can be difficult to implement (see text box 17). The pricing of services may vary over time for numerous reasons that may be unrelated to the conduct of a dominant firm. For example, in industries which involve lumpy investment the prices of services at any point may be heavily affected by investment cycle or by other impacts on supply and demand. As a result, short-run pricing data may be very difficult to assess *ex post*. Consequently, inferences can only be drawn from short term price data by considering additional information. This would include historic and forecast information covering the whole expected life of assets concerned. Similarly, quality of service monitoring may also be required to ensure pricing outcomes are not coming at the expense of the quality of service.

Where price monitoring has been used its effectiveness has been improved by:

- threat mechanisms, which define the conditions under which more comprehensive regulation such as price caps would be introduced; and
- additional dispute resolution procedures being made available to customers of the dominant firm.

8.3.1 Compatibility with emerging retail and upstream competition

Price monitoring can be used as a transitional measure to give a regulator greater certainty by monitoring an incumbent's retail prices (and services):

- as competition emerges; or
- following de-regulation.

This could relate to either excessive or predatory pricing concerns.

It can also be used as a permanent measure where an incumbent faces some competitive constraints but the market does not operate perfectly.

Determining whether there is sufficient competition such that price monitoring can be used on its own will rely on an assessment of the incumbent's market power. The outcomes of these assessments are rarely clear cut and are specific to the circumstances involved (see text box 17 below).

8.3.2 Consequences for investment and innovation

Investment might be affected under a price monitoring regime particularly where there is a high level of uncertainty surrounding either the practical application of any of the principles (i.e. what is designated as a breach under the any associated

Other lighter touch approaches

threat mechanism) or the actual consequences of non-compliance. However, the literature suggests that as long as the associate principles are clearly specified and consistently applied; and the information asymmetry regarding investment is low, investment should be reasonably efficient under a range of regulatory regimes⁴⁴.

Box 17— Price monitoring of airports

UK airports

Other than for the three largest ‘designated’ airports, that are subject to price cap, —Heathrow, Gatwick and Stansted— a system of light-handed economic regulation applies to UK airports. A key component of this regime is the disclosure of airport charges and accounts.

In the UK the rationale for relying solely on airport price monitoring relates to the fact that airports face some competitive constraints associated with pressure from rival airports and other transportation options; and the countervailing power of airlines.

However, the point at which an airport faces a sufficient competitive constraint, such that *ex ante* price caps can be removed, has been the subject of much debate. In 2007 the CAA recommended to the Department for Transport that Stansted and Manchester airports be de-designated on the basis that charges at both airports are effectively constrained by competitive pressure from rivals. The Competition Commission was not convinced by the CAA’s analysis in relation to Stansted⁴⁵ and the CAA’s advice was ultimately rejected by the Secretary of State for Transport.

Australian airports

In 2002, price cap regulation was eased for Australia’s key privately owned, city airports. In its place a new ‘light handed’ approach was introduced, which involved monitoring and benchmarking charges for aeronautical and related services. Airports were also subject to the national access regime which provided airlines with a course of action if they considered airports to be misusing their market power.

This price monitoring arrangement was reviewed in 2006 by the Productivity Commission (PC)⁴⁶. At the time the Australian Competition and Consumer Commission (ACCC), the sector regulator, suggested that the monitoring information they collected was “of limited use in assessing whether airports have abused their market power. Specifically, the current monitoring regime does not allow inefficient pricing or excess rate of return to be definitively identified”⁴⁷.

Evidence from Australia also suggests that monitoring regimes may not necessarily

⁴⁴ NERA (2004), “Alternative Approaches to ‘Light-Handed’ Regulation – A Report for the Essential Services Commission Victoria”, Sydney, 5 March 2004.

⁴⁵ Competition Commission (2008) “Stansted Airport Ltd - Q5 price control review”, presented to the CAA 23 October 2008

⁴⁶ Productivity Commission (2006) “Review of price regulation of airport services”.

⁴⁷ ACCC (2006), Submission to the Productivity Commission’s inquiry into price regulation of airport services” August 2006 p.94.

Other lighter touch approaches

involve lower compliance costs than price or revenue caps, as the compliance costs of a particular regime depend more heavily on the details of its specification. The ACCC's experience is that "undertaking annual monitoring is a relatively resource intensive exercise when compared with administering price caps ... [and] ... that attempts to 'improve' monitoring arrangements is likely to result in regimes which expand the scope of data collected and are high in compliance costs."⁴⁸

Similarly it is not clear from the data available whether investment has increased under the price monitoring arrangements relative to what would have occurred under price cap regulation. The PC in its review suggested that price monitoring has enabled airports to reach agreement with airlines on investment⁴⁹. However, the ACCC suggested that lighter-handed frameworks by construction may be highly uncertain, and add a layer of risk that may inhibit investment⁵⁰.

The PC in its 2006 review noted that it is too early to fully judge the effectiveness of the light handed approach in constraining airport charges⁵¹. But it did note that over the first price monitoring period:

- The behaviour of airports in regard to the determination of non-price terms and conditions — for example in allocating slots— was considered unsatisfactory.
- Negotiations on both price and non-price matters were protracted, such that Virgin Blue resorted to seeking arbitration for charges paid to Sydney Airport (which was subsequently dropped upon successful negotiation of an outcome).
- Some of the market constraints on airports behaviour were not as strong as was previously envisaged.

Theory suggests that light-handed regulation will be more effective where there are clear regulatory pricing principles which are implemented in an open, transparent and consistent manner and there is a credible threat of re-regulation⁵². Australian airport price monitoring arrangement include the specification of regulatory review principles

⁴⁸ The ACCC notes in terms of ongoing costs, administering a price cap regime is likely to consume the resources of an analyst for about three to four months, as well as supervisory resources. In contrast, the current airports monitoring regime (including price and quality of service monitoring) consumes the resources of two analysts for a total period of about six to eight months, as well as supervisory resources (source: ACCC (2006), p95).

⁴⁹ PC (2006), p32

⁵⁰ ACCC (2006) "Submission to the Productivity Commission's inquiry into price regulation of airport services", August 2006, p.35.

⁵¹ Productivity Commission (2006)

⁵² NERA, Alternative Approaches to 'Light-Handed' Regulation – A Report for the Essential Services Commission Victoria, Sydney, 5 March 2004.

⁵³ J Haucap, U Heimeshoff and A Uhde, Credible Threats as an Instrument of Regulation for Network Industries, August 2005, forthcoming in P Welfens (ed.), Regulatory Changes, Innovations and Investment Dynamics in the Digital World Economy, Springer: Berlin 2006 (source: ACCC, 2006, p36).

Other lighter touch approaches

which define what level of charges the Australian Government would regard as excessive and therefore justify re-regulation. The PC's review concluded that "price monitoring and the threat of re-regulation must carry more of the burden in preventing misuse of market power". They suggest that a new process for triggering further investigation of an airport's conduct should be developed where there is prima facie evidence of significant misuse of market power, an element missing from the current monitoring regime.

Commentators have noted that some of the shortcomings of light handed approaches have resulted in some industries in both Germany and New Zealand shifting back towards more traditional, heavy-handed approaches to regulation⁵³.

8.4 Negotiation and constructive engagement processes

Negotiation processes are a common feature of many regulatory regimes. It is not uncommon for network access prices (and other non price terms) to be determined through negotiations between the incumbent and new entrants. This process is often supported by an arbitration process whereby the regulator steps in should negotiations fail.

Constructive engagement is a related regulatory approach that directly involves customers in the *ex ante* regulatory process. It does this by promoting direct negotiations between customers and operators on expenditure, investments and service levels. Once again this is typically supported by the regulator stepping in should negotiations fail.

Constructive engagement aims to get consumers to reveal their preferences and willingness to pay for the services they receive. The intention is that consumers and the operator reach agreement over the outcomes rather than the regulator determining these. The regulator consequently has a relatively light-handed role in the process. Constructive engagement processes typically relates to capital investment decisions, although, depending on the specifics it can relate to decisions around the level of operating expenditures.

More generally negotiated settlements, such as constructive engagement, are seen as a way to save regulatory processing time and to achieve more innovative, flexible outcomes.

Negotiation and constructive engagement processes are more applicable to markets with only a limited number of participants or customers. For example, where any consumer groups are representative, have converging interests and are well organised and informed, such that they are in a position to negotiate with an operator. The difficulties that may arise with these processes are highlighted in the context of airport regulation (see the text box 18 below).

Other lighter touch approaches

8.4.1 Compatibility with retail and upstream competition

Reaching efficient negotiated settlements relies on both parties having some bargaining power and some incentive to reach agreement. Where a vertically integrated incumbent has control over a piece of bottleneck infrastructure then it will have limited incentive to negotiate. In this case restricting access to rivals ensures it maintains a greater share of the contestable market. Under these circumstances it is likely that any negotiation may end in dispute and arbitration.

This can increase the cost and risk associated with trying to enter the market, which may put off firms from attempting to enter, constraining the development of competition.

Australia uses a ‘negotiate-arbitrate’ model for third party access to the telecommunications network. It also has a National Access Regime which involves a similar process for determining third party access conditions for all other essential facilities. These regimes are administered by the Australian Competition and Consumer Commission (ACCC). Since its inception the ACCC has had two access disputes brought to it. One between an airline and Sydney Airport that was ultimately resolved through negotiation between the parties, following the threat of arbitration. The other went to arbitration and involved the ACCC determining an access price for a new entrant wanting to provide wastewater treatment services in Sydney.

This experience highlights that negotiation processes are more likely to be effective where each party to the negotiation has some bargaining power. This is more likely in the case of airlines and airports where each party relies on the operation of the other. It is not clear that this level of bargaining power would be present in a contestable water sector.

That said an arbitration process that applies, as and when any issues arises, may be useful for determining access prices and conditions where entry is sporadic or highly varied. In these circumstances using an *ex ante* control or commonly applied pricing rule to determine common terms and conditions may not be a cost effective or proportional response.

8.4.2 Consequences for investment and innovation

Constructive engagement processes can be used within an *ex ante* control for determining the appropriate level of investment. As noted above they rely on consumers being well represented, having converging interests and being well organised and informed, such that they can negotiate effectively with an operator (see the text box 18 below).

It is not obvious that water or wastewater customers meet these pre-conditions. In some cases they may have diverging interests and are unlikely to be well informed about alternative investment options. Instead they may have to rely on information provided by operators.

Other lighter touch approaches

With retail competition it is possible to envisage retailers negotiating with the network operator to determine appropriate levels of investment on behalf of their customers. However, it is not clear that retailers would have sufficient buyer power to stop a network operator over investing (assuming they are subject to an *ex ante* control).

With upstream competition a new entrant may need to negotiate future investment plans with incumbent in order to connect to the network and sell water or treatment services. Again it is not clear whether they would have sufficient bargaining power to negotiate an optimal, efficient outcome particularly if the incumbent remained vertically integrated.

Box 18 – The use of constructive engagement processes in the regulation of airports

Constructive engagement processes have been implemented in the electricity sector in Florida and in Canada in the gas and pipeline sector.

In the UK, the Civil Aviation Authority (CAA) has used this process in regulating airports. In particular it allows airports and airlines to negotiate on capacity requirements, future capital investment programmes, other necessary expenditure, and to define incentives for service quality.

After the negotiations, and provided an agreement is reached, airports submit their business plan to the CAA. The CAA then take this on board in setting the price control. If an agreement cannot be reached, the standard regulatory price control process is used as a default.

The system was implemented at Gatwick and Heathrow. However, at Stansted the process was terminated because of airport and airlines holding divergent views. The Competition Commission had some concerns about the process⁵⁴, in particular it identified the following as contributing to the breakdown of the process:

- the lack of genuine two-way dialogue between BAA and the airlines;
- the asymmetry of information, the scope for BAA to take advantage of the differing requirements of individual airlines;
- the control of BAA over the timetable for releasing information; and
- the absence of a dispute resolution/arbitration mechanism.⁵⁵

⁵⁴ Competition Commission (2009), “BAA airports market investigation, A report on the supply of airport services by BAA in the UK”

⁵⁵ Competition Commission, 2008, *BAA Market Investigation: Emerging Thinking*, page 8.

8.5 Strengths and weaknesses and lighter touch approaches

The lighter touch approaches described above give firms greater freedom in conducting their operations and reduce the risk that regulation will prevent new and innovative outcomes, forms of agreements and interactions between firms. These approaches do not presume misconduct and so they come with the risk that they will not adequately identify or address any market power concerns.

Although we have termed these approaches 'lighter touch' this heading can be misleading. They may induce uncertainty for incumbents as the rules or processes described are often subject to interpretation and so may not be as predictable as other regulatory approaches. They are often associated with monitoring arrangements which may create administrative costs for both the regulator and the regulated firm. Nevertheless, the regulatory burden and costs involved are likely to be lower than more comprehensive forms of regulation.

Other lighter touch approaches

9 Key choices for adapting the price control

With the challenges facing the water sector some adaptation of existing price control will be necessary. It is helpful to consider the strengths and weaknesses of the relevant tools, in the context of the key issues facing Ofwat in the future.

- **The application of price controls with emerging competition** — this could be through adapting the existing *ex ante* controls or adopting alternate price control tools in segments of the value chain where competition is emerging.
- **Managing interactions (relating to unregulated activities) that may arise with emerging competition** — with emerging competition in segments of the value chain additional approaches may need to be considered, within the price control, for managing the impact of increased interactions between regulated and unregulated companies.
- **Facilitating competition through the network access price control** — with emerging competition the price for network access or the incumbent's wholesale services will become increasingly important as input costs for rivals.
- **Future investment and innovation in the sector and how this might affect the appropriateness of the alternative price control tools** — the appropriate regulatory option will depend on the scale of investment required in the network and upstream segments and the degree of innovation and complexity of solutions that might be required to meet climate change and sustainability challenges.
- **Managing the increased importance of operational interactions** — the introduction of competition is also likely to require a number of operational interactions to take place between regulated and unregulated firms. Other broader regulatory processes may be required but in some cases these may need to be dealt with as part of a price control process.

9.1 Application of price controls with emerging competition

9.1.1 Application of *ex ante* retail price controls in contestable segments of the market

If full and effective competition emerges in the retail or upstream segments of the value chain *ex ante* controls covering these segments will become increasingly

Key choices for adapting the price control

unnecessary and ineffective. However, with partial competition an *ex ante* control — price caps, revenue caps and rate of return regulation — which covers these segments may still be appropriate.

Ex ante controls are all based on allowing the regulated firm to recover revenue equal to the efficient costs incurred in providing the service. Therefore, they provide certainty for the regulator in terms of addressing any remaining market power concerns. Assuming the regulator's behaviour is predictable and transparent they provide certainty for a regulated firm in terms of its ability to recover its costs. This encourages investment and provides greater security around the service's ongoing provision. It is the specifics of an *ex ante* control that drives its relative strengths and weaknesses and because of this they are adaptable and flexible. That said these approaches do impose a higher regulatory burden.

When a regulated company provides both regulated and competitive services, and a single till approach is adopted by the regulator, the incumbent may be protected from any competition by the price control. This may dampen any market driven incentives for efficiency. However, there are modifications that can be made to an *ex ante* control to increase a regulated firm exposure to competition, although these come with different strengths and weaknesses of their own.

- **Modifying the approach used for determining the level of the control** — Adopting a forward look approach to determining costs (i.e. LRIC) would not require that historic capital expenditure be recoverable through regulatory charges. This would increase the regulated firm's exposure to competition and encourage market driven efficiency. However, this could feed through into a higher investor perception of risk and a higher cost of capital.
- **Moving towards a dual till approach** — Dual till vs single till issues have arisen in UK electricity, airport and rail regulation. Experience indicates that the separability of shared costs and revenues and the materiality of these shared costs will influence the approach adopted. Concern about the regulated firm's market power in the unregulated activity, the appropriate allocation of risks across services and the existence of high complementarities and spillovers between regulated and commercial activities may also influence the approach adopted. It is possible to envisage alternative profit sharing mechanisms which lie somewhere between single and dual till approaches.

Increased contestability may also have implications for **the length** of the existing *ex ante* price control. More frequent price controls may reduce an incumbent's exposure to exogenous risks which may be higher in contestable segment where there is greater volatility in volumes and costs. Also the appropriate form of price

Key choices for adapting the price control

control may need to evolve as the market opens suggesting a shorter control period may be better. However, longer duration controls would increase tariff certainty for new entrants possibly making entry more financeable.

Increased contestability may result in the disaggregation of regulation whereby separate price controls are applied to separate segments of the value chain.

9.1.2 Alternative approaches for controlling retail prices

Pricing rules that constrain the pricing conduct of the incumbent are typically applied in situations where competition is emerging, such that the rationale for a more comprehensive *ex ante* price controls may be reduced.

- Pricing rules can often act as both a price cap and a price floor which means they can simultaneously prevent excessive and predatory pricing.
- Unlike *ex ante* price controls they are not always based on periodic assessments of efficient costs of providing the service. As a result they can provide strong incentives for productive efficiency. They may also have a lower regulatory burden and implementation costs when compared to *ex ante* controls.
- However, they may not lead to allocatively efficient outcomes and they are not particularly adaptable given their fixed nature and so can easily become redundant. Also some pricing rules may only be applicable in certain specific circumstances as they can rely on the existence and efficiency of the tariff to which they can link.

Pegged tariffs expressly link the price charged in a non-competitive segment of the market to a related price in a competitive segment. In general they are not suitable for controlling retail prices where there is effective retail competition, unless they are intended to achieve a broader social objectives associated with removing pricing discrimination.

They could be used in a partially contestable retail market, by pegging non-contestable household prices to contestable non-household prices. However, there is a risk that the incumbent could choose to increase prices in both markets and still comply with the pricing rule. The household price could instead be pegged to a non-household 'market price'. The difficulty in defining the 'market price' could make this hard to implement.

Default and safeguard tariffs may be effective as transitional measures in advance of the de-regulation of an incumbents retail operations. When used in this way they may give the regulator time to observe the effectiveness of competition in the retail market.

Lighter handed approaches are relevant to situations where there is a reasonable level of contestability but concerns around market outcomes remain.

Key choices for adapting the price control

Relevant mechanisms could include non-discrimination obligations, disclosure requirements, price monitoring; and negotiation and constructive engagement processes. These could be alternatives or complements to other forms of price control as they can resolve both price and non-price issues that may arise. These are often used for transitional purposes to help foster competition and give the regulator greater certainty in regards to the development of competition.

- Lighter handed approaches give firms greater freedom in conducting their operations and reduce the risk that regulation will prevent new and innovative outcomes, forms of agreements and interactions between firms.
- However, they may also induce uncertainty for incumbents as the rules or processes described are often subject to interpretation.
- These approaches do not presume misconduct and so they come with the risk that they will not adequately identify or address any market power concerns.
- While the regulatory burden associated with light handed regulatory approaches may be lower they are often associated with monitoring arrangements such that they still impose some administrative burden on both the regulator and the regulated firm.

9.2 Approaches for managing additional interactions that may arise with emerging competition

It is possible to envisage many different potential interactions occurring as a result of the introduction to competition. Depending on the way in which competition is introduced, regulated undertakers may become counter-parties to contracts with providers of unregulated competitive water and wastewater services. For example, companies selling water abstraction rights or providing upstream treatment services. It is likely that the regulator will be asked to provide guidance around how the costs and performance delivered under such contracts will be viewed in future price controls.

While decisions on the structuring of the contracts will be for future work on the development of competition, it is possible that once contracts are let, future price controls will have little or no influence over them and would need to allow the regulated company to pass through these costs.

Where the regulated undertaking becomes involved in the purchase of tradeable abstraction rights or bulk water trading, it is possible that future price controls may need adaptation to reflect this. Increased volatility of costs makes it more likely that mechanisms to deal with exogenous risks will need to be applied. It

Key choices for adapting the price control

may also become necessary to consider changes in controls to focus on the premia against prevailing market prices, rather than the level of costs overall.

Future price controls may be constrained by decisions taken in the set-up of contracts between incumbents and other unregulated entities. Therefore, there may be an important choice as to the extent to which regulatory intervention is required in the formation of these contracts or whether it new entrants and regulated undertakings can be left to conduct negotiations in a timely and efficient manner. For example the regulator could sponsor (or mandate) the development of standard contracts forms.

9.3 Facilitating competition through a network access price control

Even with full and effective retail and upstream competition a price control would still be required to control the price set for access to the incumbent's network and its wholesale services. There are two key options available to Ofwat:

- a bottom up *ex ante* price control; or
- a top down access price control, based on a regulated retail price.

In either case a key choice for Ofwat will be whether to be:

- pro-active and define the wholesale or network services provided by the incumbent in order to set all encompassing price controls for these services; or
- reactive and develop price controls that respond to potential retailers or upstream operator's requirements.

9.3.1 Bottom up *ex ante* access price controls

A key strength of *ex ante* controls in the context of emerging contestability is their flexibility. These controls can be varied or manipulated in different ways, in order to get trade-offs right, for the circumstances faced. Given they are periodic they can easily be adapted to any changes in the market structure. Also they can take into account of any cost savings made by a regulated firm over time. This means the network access price is more likely to be allocatively efficient.

A weakness of bottom up *ex ante* controls is that they cannot be used to prevent predatory pricing by an incumbent in a contestable segment of the market. Therefore, other complementary regulatory approaches (such as pricing rules and lighter handed approaches) may be required to manage this risk.

Key choices for adapting the price control

9.3.2 Top down retail minus controls

As an alternative to a bottom up *ex ante* control on network access prices a **top down price control** could be used. However, applying this type of control would require the continued existence of a regulated retail price. A retail minus control's effectiveness in promoting efficient competition depends on how the costs, being subtracted from the reference retail price, have been estimated. The complexity associated with doing this is a major weakness of retail minus access price controls. Compounding this are the difficulties associated with adapting these controls over time.

That said there are advantages to retail minus price controls particularly when applied in the context of emerging or partial competition. In particular they may be a more proportionate approach given they impose a lower regulatory burden and administrative costs. This can make them more appropriate when used:

- for transitional purpose (in order that the regulator can wit and see how competition develops) or
- where there is partial competition such that they apply to a small segment of the market.

Retail minus access price controls also reduce the risk of regulatory margin squeeze and enable the regulator to maintain any desirable retail tariff structures or cross subsidies. This means they are compatible with using retail tariff structures to encourage water use efficiency.

9.3.3 Other complementary mechanisms

Additional complementary regulatory arrangements, such as transfer pricing and accounting separation, would be required to accompany any access price control. This is to ensure the incumbent can not shift costs between the upstream and network components of its operations. Otherwise it could use this flexibility to push up the regulated network access price in order to foreclose either the upstream or retail market.

9.4 Impact of investment and innovation on the suitability of the alternative price control tools

9.4.1 Ex ante controls

When applied in a predictable and transparent manner *ex ante* controls provide a firm with certainty around cost recovery. This lowers the financing risk and the cost of capital. Price or revenue caps based on a building block FCM approaches; or rate of return regulation are the most favourable in encouraging investment, although rate of return regulation may encourage inefficient over-investment.

Key choices for adapting the price control

However, when there is uncertainty around the future efficient investment needs these approaches may limit the regulator's ability to take advantage of future innovations. *Ex ante* controls based on a building block or FCM approach allow all capital costs incurred to be recovered through the price control. As such investors are not faced with any risks associated with changes in technology or the value of their assets, as they would be in a competitive market. Price controls that de-link the regulated revenue from the firm's actual costs (i.e. LRIC based approaches or pricing rules) will provide greater incentives for innovation and out-performance as any resulting efficiency savings are not necessarily passed straight back to consumers.

In general, innovation can be encouraged by targeting controls at outputs. Yardstick and benchmarking techniques can be used to do this. However, where these techniques involve separate benchmarking of capex and opex this may discourage innovative, co-ordinated solutions.

9.4.2 Length of the price control

There is no clear link between the length of a price control and the impact on investment and innovation. In practice it will depend heavily on the circumstances in which it is applied.

With an *ex ante* control capital expenditure can be recovered over more than one regulatory period through the regulatory asset base (RAB). This can create some uncertainty for the regulated firm when its costs can easily be affected by unforeseen circumstances. The longer the regulatory period the longer the forecasting uncertainty and the greater the risk of unforeseen circumstances affecting its costs over the period. This could feed through to a higher cost of capital and financing costs. Refinements, such as provisions for re-openers or, cost pass-through items, can be made to address this concern.

Conversely a longer term price control would be less risky where the market is more stable (i.e. limited demand volatility) and it is associated with less exogenous risk. A longer price control in these circumstance would allow the firm to internalise the benefits and costs of any innovation within a single control period. This may encourage dynamic efficiency and therefore innovation and efficiency improvements over time.

9.4.3 Pricing rules

The fixed nature of pricing rules means that they do not take account of any change in costs. Depending on the circumstance in which they are applied this can increase the cost of financing under these controls when compared to *ex ante* controls. That said they may provide strong incentives for innovation given this disconnect between the firm's prices and its costs.

Key choices for adapting the price control

9.5 Increased importance of operational interactions

The introduction of competition is also likely to require a number of operational interactions to take place. For example issues with the quality or timelines of information exchanged can impact on the effective and efficient operation of competitive arrangements.

In the event that concerns around these interactions are identified, it is likely that the majority of these will be dealt with by other regulatory processes, for example via regulatory participation in ongoing industry governance processes and the application of some of the lighter touch approaches such as non-discrimination obligations. However, as indicated by precedents in both electricity and gas regulation, there may also be occasions on which issues with such interactions need to be dealt with as part of a price control process.

Key choices for adapting the price control

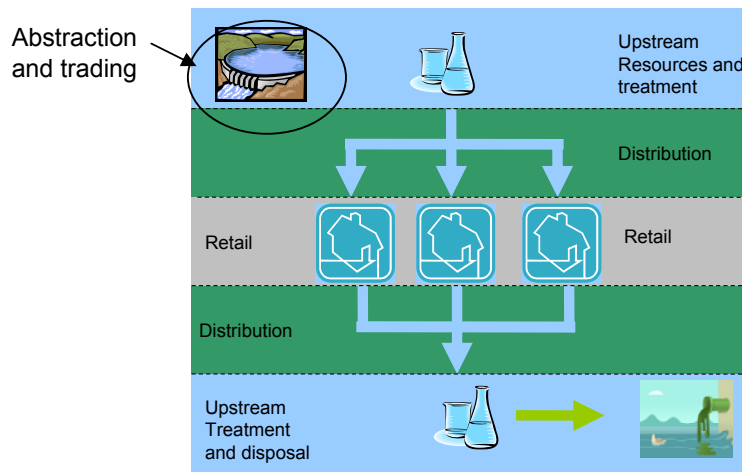
Annexe 1: Structure and characteristics of the water value chain

For the purposes of this project we consider the supply chain can be categorised into three key activities (see Figure 5 below):

- Upstream assets – Water treatment and wastewater and sludge treatment and disposal activities; and water resource abstractions or water purchasing activities.
- Distribution network – Water and wastewater distribution network activities.
- Retail – Water and wastewater retail activities.

These activities are sufficiently separated to identify a range of interactions that the price control apparatus will need to deal with. At the same time it is sufficiently high level to enable comparison with other network industries.

Figure 5. Key segments of the supply chain



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The **upstream** activities of the supply chain are characterised by:

- Local markets with some economies of scale in treatment and disposal (which may have reduced over time).
- Lumpy investment, with some scope for innovation through advances in small scale treatment technology, reducing initial capex requirements.
- Water resource abstraction and trading activities.

- Presence of a number of broader government policies, associated with environment and water resource management, which impact on activities in this segment.

The **distribution network** activities of the supply chains are characterised by:

- Large economies of scale making the network uneconomical to duplicate. As a result regional monopolies are likely to persist. There is also the potential for market power in this segment of the supply chain to be leveraged into other segments.
- Large lumpy investment, with some scope for efficiencies in operational processes.
- Relatively few government policies impact on distribution activities of operators.

The **retail** activities of the supply chain is characterised by:

- Some economies of scale, but potential for economies of scope across services (i.e. between energy and water retail). Level of contestability unlikely to vary across regions.
- Relatively stable investment profile, some scope for efficiencies in operational processes.
- Presence of broader government policies associated with demand management and affordability which impact on activities.

Annexe 2: Methods for determining the level of an *ex ante* control

Under the price and revenue cap regimes outlined in Chapter 3 the regulator must estimate the efficient costs of providing the service for the future regulatory period in order to calculate the revenue requirement. There are two main approaches for estimating these costs:

- the 'building block' approach; and
- forward-looking long run incremental cost approaches.

These are described below. This section also considers the following methods often applied in determining the level of the revenue requirement.

- the use of benchmarking to estimate efficient costs; and
- the estimation of the asset base using either Financial Capital Maintenance (FCM) or Operating Capital Maintenance (OCM) approaches.

The building block approach

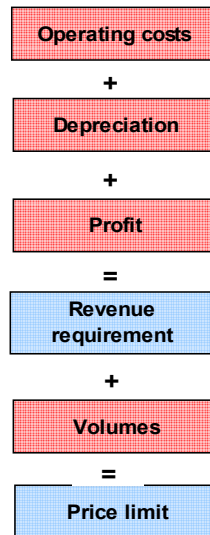
Under the building block approach the regulator calculates the revenue requirement based on an assessment of the services and quantities to be provided and of the individual cost components.

These individual cost components are:

- operating costs (opex) – these are often separated into opex associated with existing services and opex associated with new services;
- depreciation charge – this is the regulator's view on the capital consumption in the period;
- return on capital – this is the regulator's estimate of the return that investors require, multiplied by the Regulatory Asset Base (RAB).

Corporate tax payments can be identified as a separate item, or can be included in the return on capital (by using a pre-tax cost of capital).

A simple schematic of the building block is shown in Figure 6 below.

Figure 6. Building block approach

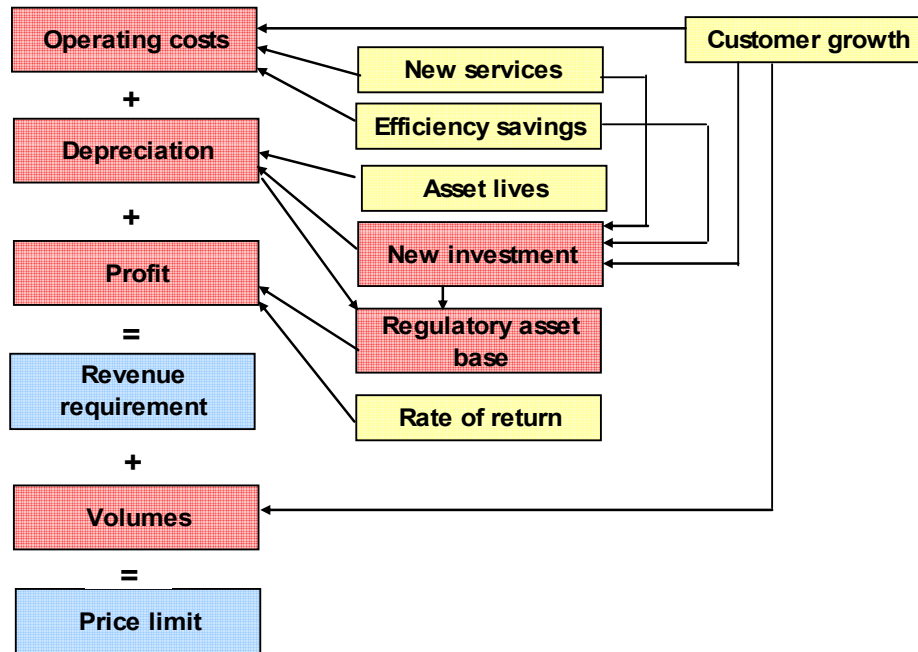
Source: Frontier Economics

In order to apply this building block approach the regulator needs to assess the following inputs:

- ▣ the scope and volume of services to be provided;
- ▣ the efficient level of operating costs;
- ▣ the efficient amount of capital expenditure (capex);
- ▣ the appropriate asset lives (for the depreciation charge);
- ▣ the rate of return; and
- ▣ the value of the RAB.

Figure 7 shows a schematic of the building block approach showing how these underlying inputs feed into the calculation of the main blocks. The yellow shaded boxes represent the main input parameters, the red shaded boxes are calculated variables and the blue shaded boxes are the regulatory outputs.

Figure 7. Building block approach with main input parameters



Source: Frontier Economics

The building block approach is common across the majority of price cap, revenue cap and rate of return regulatory regimes.

Forward looking long run incremental costs

An alternative approach used in setting the level of the control is to focus on the forward looking long run incremental costs (LRIC) of providing the service.

LRIC models attempt to estimate the costs that an efficient operator would incur if using a hypothetical, efficient network to supply a forecast demand for the service. There are numerous methods for estimating LRIC but they revolve around modeling the operating and capital costs associated with a hypothetical network/operator supplying an incremental increase in demand for the service. A price is then calculated that recovers these costs.

The approaches to the calculation of LRIC based charges can vary according to the following factors:

- the scale of the increment assumed;
- the extent to which the modeled network is optimised from its current arrangements; and

Annexe 2: Methods for determining the level of an ex ante control

- the extent to which any fixed or common costs associated with the services can be recovered through a mark-up on the LRIC calculation.

LRIC based approaches to determining regulated charges are used mainly in the telecoms sector. When determining regulated charges the telecoms regulator Ofcom focuses on forward looking LRIC (FL-LRIC). Ofcom's requirement, that costs are efficiently incurred on a forward looking basis, can be interpreted as: what are the costs that would be incurred by a new operator entering the market today?

This approach is consistent with the European Commission recommendation on the treatment of fixed and mobile termination⁵⁶. The Commission recommends that termination rates should be based on the costs incurred by an efficient operator calculated on a bottom-up long run incremental cost (LRIC) basis which ignores legacy costs. The Commission writes that: *"In a competitive environment, operators would compete on the basis of current costs and would not be compensated for costs which have been incurred through inefficiencies. Historic cost figures therefore need to be adjusted into current cost figures to reflect the costs of an efficient operator employing modern technology. Operators which are compensated for actual costs incurred for termination have few incentives to increase efficiency."*

There main differences between the building block and LRIC approaches are as follows.

- By setting prices based on forward looking incremental costs the LRIC approach replicates closely the expected outcome from a competitive market. This approach would promote allocative efficiency.
- Under a LRIC approach costs are based on a hypothetical network rather than the actual network, and on incremental rather than total costs. This raises the risk that regulated prices will not reflect the actual costs being incurred by the network operator. This could feed through into a higher investor perception of risk and a higher cost of capital.
- LRIC approaches can result in historic capital expenditure being stranded and not recovered from regulatory charges. This may be part of the higher risk profile, but it can be an advantage in sectors which are exposed to increasing competition.

Benchmarking techniques for estimating efficient costs

Mimicking the forces of the competitive market requires that firms recover the efficient costs of providing the service. These costs can be estimated by

⁵⁶ "Commission recommendation of 7 May 2009 on the regulatory treatment of fixed and mobile termination rates in the EU", 2009/396/EC, Official Journal of the European Union, 20 May 2009

Annexe 2: Methods for determining the level of an ex ante control

considering the past performance of the regulated firm or the costs of one or a number of comparator companies (possibly from similar industries in the same country or from the same or similar industries in other countries).

A wealth of benchmarking techniques exist with which to compare the performance of companies. This section is not intended to provide a definitive overview of all of the techniques that might be adopted, nor is it intended to provide an academic review of their properties. Here we provide a framework for describing the techniques.

In order to aid description of the range of techniques, we have identified four key dimensions in which there are material choices over how to benchmark companies. This framework is illustrated in Figure 8.

Figure 8. Benchmarking options

Costs	Cost drivers
<ul style="list-style-type: none"> • Top down, bottom up? <ul style="list-style-type: none"> – Total cost? – Competing cost? – Opex and capex? – By activity/ process? • If total cost, then which measure? <ul style="list-style-type: none"> – Totex? – Opex + capital consumption? • Separate services or aggregate • Regional/company specific adjustments? 	<ul style="list-style-type: none"> • High level or detailed? • Should “outputs” be included? If so how? <ul style="list-style-type: none"> – Direct inclusion of full set? – Single composite of all outputs? – Excluded? • Exogenous/ environmental variables? <ul style="list-style-type: none"> – Complex measure? – Proxy? – Excluded?
Sample	Technique
<ul style="list-style-type: none"> • International sample or national? • Cross section or panel? • Historic data only? • Future plans? <ul style="list-style-type: none"> – E.g. total cost outcome if company plans are achieved? 	<ul style="list-style-type: none"> • OLS (COLS/MOLS) • SFA • DEA <ul style="list-style-type: none"> – Stochastic DEA • TFP (and other productivity based approaches) <ul style="list-style-type: none"> – Further choice in specification, e.g. returns to scale etc. • Reference/model network techniques

Source: Frontier Economics

The following subsections provide further detail of the options that exist in each dimension.

Costs

There are many different ways in which costs could be structured, aggregated and treated for inclusion in a benchmarking study. The key dimensions of choice are identified below.

Annexe 2: Methods for determining the level of an ex ante control

- **Top-down benchmarking** is based on seeking a single, high level measure of all financial inputs used in a business. In principle top-down benchmarking removes any incentive distortions relating to the mix of inputs. For example, it is irrelevant whether companies choose to replace or maintain assets, to contract out or keep work in-house.
- A **bottom-up analysis** is an alternative to top-down benchmarking. Here different types of cost might be subjected to different types of benchmarking analysis. Costs might be split according to different types of activity (e.g. wages and salaries, IT, repair costs, reinforcement costs etc), with each cost type entering a different model and being compared to different cost drivers. The benefit of an approach of this kind is that has the potential to yield more information to the regulator on *why* different companies might be efficient or otherwise. Whereas top-down benchmarking might reveal aggregate efficiency, bottom-up allows the regulator to offer an explanation for why this judgement has been reached. However, it also creates material implementation issues.
 - First, the greater the degree of disaggregation, the greater the burden created in monitoring the quality of the reported cost data.
 - Second, introducing boundaries between costs and benchmarking those costs in different ways can create material distortions of managerial incentives.
 - Third, care is needed when applying the results to avoid “cherry picking” efficient performance in each activity, thereby creating an efficiency standard that cannot be met by any firm.
- **Capital costs** give rise to a number of benchmarking challenges. Capital costs tend to be lumpy in nature and inherently less likely to be stable from year to year. They also give rise to long lived assets that require maintenance over time but provide services over the course of their lifetime. How should such costs be treated in a top-down benchmark?
 - One approach is to adopt a project finance model of the company with a measure of “capital consumption” entering into a total cost benchmark.
 - An alternative is to benchmark total expenditure (totex), comprised of the flow of opex and capex. However, given the lumpiness of capex and potential fluctuations from year-to-year the results of this approach might be volatile.
- Costs could be adjusted for **regional factors** prior to benchmarking. Adjustments might reflect, for example, differences in underlying labour

Annexe 2: Methods for determining the level of an ex ante control

costs between regions. The alternative to prior adjustment (in a regression based assessment at least) is to include within the model an additional variable that captures differences in regional input prices.

Cost drivers

Benchmarking models need to take account of the key cost drivers of the business. Ideally a comprehensive set of cost drivers should be included in order to capture as fully as possible the scale of the network task that each firm is required to undertake. In addition to measuring the task at hand, it might also be necessary to include additional variables that capture valued outputs, such as quality of supply.

Sample

The greater the volume of data that is available the more variables it is possible to include within a model and the more robust the estimation of that model is likely to be. As a consequence, it is likely to be desirable to include as much data as possible.

The key decision to be taken here is whether to augment that sample with international data, given the potential difficulties that international benchmarking can give rise to. It is also helpful to consider whether benchmarking should be restricted to historic outturn costs alone, or whether benchmarking of future plans could prove informative. For example, it would be possible to undertake total cost benchmarking of firms business plans in order to identify whether the implied future charges of a given company are broadly reasonable or appear out of line with the rest of the industry.

Techniques

There are many different techniques that could be adopted to bring together the cost and cost driver data in order to estimate relative efficiency. We provide a very brief overview of those techniques here.

- **Ordinary Least Squares (OLS).** This technique makes use of regression based techniques in order to identify the relationship between the left hand side (LHS) dependent variable (i.e. total cost) and the right hand side (RHS) independent variables (i.e. cost drivers). The standard OLS model will return a predicted cost consistent with the average level of performance in the sample. Given this it is traditional to “shift” the frontier to reflect a better than average performance. For example the frontier might be shifted to match the level of the best performing business in the sample, (a Corrected OLS).

Annexe 2: Methods for determining the level of an ex ante control

- **Stochastic Frontier Analysis (SFA):** SFA is also a regression technique that shares many of the properties of the OLS. However it adopts a more sophisticated approach to determine the location of the efficient frontier. SFA is a technique that aims to identify whether observed differences in performance should be regarded as systematic evidence of inefficiency, or whether they arise as a result of “noise” in the data.
- **Data Envelopment Analysis (DEA).** DEA is an extension of simple output to input ratio analysis to cases where there are potentially many inputs and many outputs. DEA techniques can be used to establish which firms produce the most output(s) for the least input(s) and by how much inefficient firms need to decrease their input (or increase their outputs) in order to also be regarded as efficient.
- **Total Factor Productivity (TFP).** TFP is an approach to measuring productivity where all factors of production are considered. The technique measures the rate of change of a basket of outputs relative to a basket of all input factors⁵⁷. Arguably, this approach is not actually a benchmarking methodology at all as it does not seek to measure the relative performance of individual companies, but of the entire industry. A TFP methodology underpins the regulatory regime imposed on the Dutch energy network firms.
- **Engineering cost models.** These techniques are based on constructing an engineering model of each regulated firm. They produce an optimal network specification, setting out the network that could be constructed in order to undertake the network activities of the firm in question.

Company specific versus yardstick approaches

Another issue for the regulator to consider is the manner in which to apply the results of a benchmarking exercise.

- Under a **company specific** approach the regulator assumes a gradual transition from the actual cost level to the assessed efficient benchmark. For example, the current Ofwat approach is to assume 60% convergence over five years.
- Under a **yardstick** approach the regulator assumes immediate convergence to the assessed benchmark. Therefore no weight is applied to the actual level of costs for the firm.

⁵⁷ It is also possible to derive partial measures of productivity, of which the most commonly encountered example are labour productivity indices.

Annexe 2: Methods for determining the level of an ex ante control

A yardstick approach has stronger incentive properties than a company specific approach since the allowance for costs is independent of the firm's own actual performance. The drawback with yardstick regulation is that there is a greater chance of regulatory error (setting prices that do not allow appropriate cost recovery).

Regimes that apply a full yardstick are rare. The system of energy regulation in the Netherlands involves a significant degree of yardstick comparison. UK regulatory regimes are generally based on company specific approaches. Nevertheless it is not uncommon to use yardstick approaches for some of the components of the building block. For example, the cost of capital is typically estimated using a yardstick approach.

A simple yardstick approach could be more appropriate when applied to some of the 'lighter touch' forms of regulation.

Financial capital and operating capital maintenance models

The final aspect to determining the overall level of the revenue to be recovered under the control relates to the treatment of past investment in capital expenditure. There are two main options for regulators; financial capital maintenance (FCM) and operating capital maintenance (OCM).

- **Under FCM** the regulator's approach to determining the revenue requirement is designed to allow the firm (if efficient) to earn a fair return on the amount of capital that has been invested by equity and debt providers. As the name suggests, in this case the RAB is viewed as a measure of financial capital.
- **Under OCM** the regulator's approach to determining the revenue requirement is designed to allow the firm to earn a fair return on the value of the capital that it needs to provide the appropriate level of services. In this case the RAB is viewed as a measure of operating capital.

The practical difference between the two approaches lies in treatment of past investment expenditure. Under an FCM approach regulated charges are set to allow the recovery of the capital invested. In other words there is no scope for assets to be stranded from the RAB. Once an investment has been accepted into the RAB, it remains there until it is fully depreciated.

In contrast under OCM the value of existing assets in the RAB can be revalued to reflect changes in technology, input prices and asset obsolescence. Under OCM an efficient firm may earn more or less than the fair return, depending on changes in asset values.

Annexe 2: Methods for determining the level of an ex ante control

As with other decisions on regulatory design, the choice between FCM and OCM will affect risk allocation and incentives.

- The OCM approach more closely replicates the working of a competitive market. The risk of technological change and underlying asset price changes lies with investors. This could feed into a higher cost of capital than under the FCM approach.
- The FCM approach may weaken incentives to ensure that investment decisions are optimal. It may also work against the principle of allocative efficiency as regulated prices can diverge from the underlying efficient cost level.

As a result, OCM is likely to be the preferred approach in sectors where there is greater scope of competition, since entry and exit decisions could be distorted by an FCM structure. It would also be preferred in sectors where there was rapid technological progress.

In practice, more formal price regulation regimes are regulated under an FCM approach. This applies to UK regulated utilities and the traditional rate of return style regulation regimes.

OCM has been applied in the telecoms sector for LRIC based charges. OCM based approaches have also been applied in the past in Australia, for example in determining gas interconnection charges.

In the sectors where FCM is applied regulators adopt a number of methods to address the incentive concerns. These methods are designed to ensure that only efficiently incurred investment is accepted into the RAB. These methods include:

- ***Ex ante review of investment.*** The regulator approves investment plans for the next period at the time price control. Overspend in the investment against the plan may not be added to RAB. This approach is adopted by Ofwat and other UK regulators.
- ***Ex post review.*** This methods presumes that out-turn capex will be added to the RAB unless it is considered to be inefficient or inappropriate. This approach was adopted in UK energy regulation in earlier price controls and is also applied in US rate of return regulation.

Annexe 2: Methods for determining the level of an ex ante control

Annexe 3: Level of aggregation of *ex ante* controls

The ways in which *ex ante* price, revenue or earnings controls can be applied will vary in terms of the aggregation of the control. In other words is the control applied to the individual products and services or is the control applied at a more aggregate level?

In terms of aggregation of the price control the regulator has a number of options. For example, the control could be applied to:

- an individual product or service, so that the regulated firm can not increase the prices or revenues of that product or service beyond a given amount; or
- a ‘basket’ of services — in the case of a price control the regulated firm can change relative prices within that basket so that the (weighted) average price does not increase (decrease) by more (less) than the cap.

Individual price caps are uncommon, partly due to the difficulties in allocating fixed and common costs across services (particularly in a dynamic context). Individual price caps may be more suitable in segments which are being opened up to competition since it can limit the scope for anti-competitive rebalancing of prices by the incumbent firms. Some safeguard price caps described in chapter 7 are of the form of individual price controls.

In contrast, tariff basket approaches allow the firm some degree of flexibility in setting prices by setting a weighted average cap across the different services. Tariff baskets have a number of features.

- The flexibility in pricing allows the firm to respond to changing patterns of cost and demand across services. This can be an advantage but can also lead to drawbacks since the firm could use the flexibility to deter competition or to fairly charge certain customer groups.
- As a result it is not unusual for the tariff basket to be complemented by restrictions on individual charges or restrictions on the relativities between charges.
- Tariff baskets do not face the issues associated with revenue caps where the firm has an incentive to restrict output.

Annexe 4: Complementary mechanisms to an *ex ante* control

In many industries, refinements have been made to the basic control models to address particular issues or concerns.

- Information asymmetries that may exist between the regulator and the regulated firm. This may be in relation to the forecast capital investments (whether they are optimal, in terms of nature, scale and timing) or the forecast of demand.
- Concerns around the incentives provided for innovation or investment in expanding capacity (under revenue controls).
- The absence of controls on the quality of service that mean the regulated firm may create costs savings at the expense of the quality of service provided.

Encouraging accurate forecasting or incentivising efficient investment

Table 7 presents the most common approaches used to encourage accurate forecasting, the efficient delivery of capex and greater levels of prudent investment.

Table 7. Mechanisms for encouraging prudent capital expenditure

	Description and goal	Example
Menu regulation	Companies offered a choice of regulatory contracts ⁵⁸	Ofgem, Ofwat
Trigger mechanisms	Triggers payments are incurred by the operator for any delays in the satisfactory delivery of key capital projects.	CAA (Heathrow's terminal 5)
Cost of capital uplift	Uplifts are applied to the cost of capital for new projects which expand capacity.	CRE (energy, France), CAA, European telco regulation (for NGNs)
Contracting out new capital requirements	Efficiency of new investment checked by contracting out the work.	New terminals for BAA airports Ofwat's Thames Water Tideway, Ofgem's offshore transmission

⁵⁸ Allowing companies to choose the contract that will be the easiest for it to meet, for example a contract focusing on operating efficiency if the company has low capital investment opportunities

Cost benefit assessments	new investments are checked using a cost benefit analysis framework.	Ofwat
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Source: Frontier Economics, CEPA (2009) "The use of RPI-X by other network industry regulators" report prepared for Ofgem.

Quality of service controls

A disadvantage of *ex ante* price and revenue caps is that, in the absence of controls on quality of service, the regulated firm may generate cost savings at the expense of the quality of service. Thus most *ex ante* regulatory approaches monitor a firm's quality of service and include mechanisms for controlling or incentivising firms' behaviour. This can include the following options.

- Stipulating minimum, legally binding, targets for service performance, with the potential for legal action if the firm fails to comply.
- Customer compensation payments in the event of service failure.
- The inclusion of specific financial incentives in the price cap formula. For example, the OPA adjustment applied in the water sector or the IIP regime applied by Ofgem.
- The use of peer pressure to encourage performance and improvement through the publication of league tables and performance appraisals.

The Box below summarises some of the quality mechanisms applied in the postal and rail sectors.

Approaches used in the UK postal sector

The Postal Services Act 2000 sets targets for service quality in terms of specified timeframes for delivery (for example the percentage of first class mail that should be delivered in the next working day). The mechanisms used to incentivise these targets includes adjustments to Royal Mail's allowed revenue and a customer compensation scheme. In the scheme introduced in 2003 compensation for large users was capped at 5% of spend, in order to protect the financial viability of the USO. Unlike in the cases of electricity and water the compensation payment reflects the price paid rather than any estimate of the loss of value by the customer.

Train operating companies (TOC)

In addition to penalty schemes built into each of the TOCs' franchise agreements for delays, cancellation and short-formation trains, the regulator also publishes comparative data on the relative performance in terms of delays, overcrowding and how they deal with customer complaints.

Annexe 4: Complementary mechanisms to an *ex ante* control

Annexe 5: Operational and market codes

Management of operational interactions required for retail competition

The retail competition arrangements in Scotland provide a useful 'point of departure' to identify the types of operational interactions that could arise over time in England & Wales. Some of these arrangements necessarily reflect the specific circumstances in Scotland, the choice of boundary between contestable and non-contestable customers and the chosen approach to market implementation.

While it is possible that the future England & Wales arrangements will differ from those applied in Scotland, it is likely that there will still be strong similarities between the types of interactions that occur.

Two key approaches for regulating operational interaction associated with retail services include:

- operational codes; and
- market codes;

These are considered in more detail below.

Operational codes

Table 8 provides a very high-level summary of the interactions covered by the Operational Code maintained by Scottish Water. These concern the interactions between the various retail businesses and Scottish Water as provider of bulk water and network services. In addition to identifying the type of interactions, the table also provides commentary on the sorts of regulatory interventions that might be envisaged.

Table 8. High level summary of main elements in operational code in Scotland

Area of Interaction	Possible forms of regulatory intervention
Customer definitions	Resolution of disputes on eligibility for contestable sector – periodic price control could seek to change definition or eligibility threshold.
New connections	Individual price quotations could be determinable ¹ . May also be requirements on incumbent undertaker to provide information to allow competitors to make quotations. Likely to need non-discrimination obligations and process service levels to provide necessary information.
Water quality	Provisions to allow network operators to visit premises of contestable customers in order to test water quality or investigate complaints. Unlikely to be major area of price control focus unless there were to be evidence of differential treatment of customers who had changed retailer. Could become more significant area if future arrangements supported different qualities of water.
Metering – covering provision of asset, operation, repairs and meter reading	Regulatory emphasis will be influenced by whether metering remains a network activity (focus on efficiency and service) or whether it becomes the responsibility of retailers (focus on encouragement of competition and management of transition arrangements). Moves to universal metering and/or smart metering may also significantly impact on this.
Customer contacts, enquiries and complaints	Decision on responsibility for call handling will impact significantly on interactions. Regulatory focus likely to be on non-discrimination and service levels – could be subject of incentive mechanism within price control.
Planned and unplanned network activities	Unlikely to be major area of price control focus unless there were to be evidence of differential treatment of customers who had changed retailer. Could be subject to service-level incentives and part of GSS type schemes.
Trade Effluent Control	Unlikely to be major area of price control focus unless there were evidence of differential treatment of customers who had changed retailer.
Supply point verification	Some method to allocate responsibility for particular supply points to different retailers will be needed – likely to be IT system once number of contestable customers grow. Nature of regulatory influence will depend on who is responsible for provision and operation of system. If provided by regulated entity, this may require oversight of costs. May also require focus on responsibility for data accuracy and adherence to agreed service levels.

1. The regulator has powers to intervene if the developer/customer and network are unable to reach agreement on the appropriate charge.

Market codes

The other key document covering arrangements for retail competition in Scotland is the Market Code (MC). The MC governs the interactions between retailers, Scottish Water as the Wholesaler and also the Central Market Agency – an independent entity created to run the market arrangements. The MC is more commercial in nature than the Operational Code, covering the processes for customer transfers and the financial settlement for water supplied under the wholesale arrangements.

The level and structure of prices within the wholesale arrangements is an obvious area of potential interest for future regulation. However, there are a number of other aspects of the MC which may be relevant.

- **Entry and exit provisions** – it is important that these are not unduly onerous in either the breadth or nature of the requirements.
- **Services of last resort** – outlines arrangements needed to deal with the failure of a participant and ensure that all customers have access to the necessary services.
- **Equity of governance** – ensuring that governance arrangements are not dominated by any particular party or group of interests but also are capable of future change.
- **Transparency of information** – what information is published to help inform customers and other interested parties?
- **Obligations to maintain master reference data** – obligations and incentives to ensure that data sets are accurate and made available where needed.
- **Working capital requirements** – ensuring that obligations to provide credit-cover and timing of settlements (for both water and network services) do not create unduly onerous working capital costs for retailers.

As noted in the section 2.3.4, the periodic price control is only one means by which the regulator may be able to exercise influence. If a MC was developed for England & Wales it is likely that many of the aspects noted above would be subject to regulatory influence during the design and approval process. However, if the England & Wales arrangements are based more on bilateral contracts involving the present undertakers, then price control apparatus may be an important part of both the change process and ongoing monitoring.

Annexe 5: Operational and market codes

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Annexe 5: Operational and market codes

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