

Foreword from Severn Trent

Contributions to Ofwat's Water 2020 programme

The implementation of the Water Act 2014 will mean significant change in the water sector over the next five years and beyond. Ofwat has recently published *Towards Water 2020 – meeting the challenges for water and waste water services in England and Wales*, which sets out the challenges facing the water sector in England and Wales and identifies six high level questions relating to the future regulation of the sector.

Ofwat has asked water companies and other stakeholders to be part of a “market place for ideas” on key topics. It has encouraged the industry to contribute discussion papers to support this consultation. Ofwat aims to consult in December 2015 on their initial proposals for regulatory change at the 2019 periodic Review.

We have always welcomed the opportunity to help shape the regulatory framework and competitive landscape of the water sector in England & Wales. Through our *Changing Course* series of publications we have promoted sector change; from our first publication on delivering a sustainable future for the water sector to subsequent publications on water trading, sustainable finance and designing incentives. We were pleased to see that many of the issues we raised were reflected in the regulatory framework for 2015-20 and we are very pleased to have the opportunity to contribute to the development of the framework for 2020 and beyond.

As part of ‘Water 2020’ Ofwat are looking to introduce further competition by developing upstream markets. We support competition and market reform in the right areas – where it can add value, promote growth and where it benefits customers. We can see that upstream competition, through water trading or new entry, could improve resilience and deliver environmental benefits but we should not lose sight that the current Regulatory Capital Value (RCV) based funding model is highly effective. We believe there remains scope to deliver the required changes without undermining this trusted mechanism. As a consequence we have commissioned three independent reports on subjects that will be critical to the Water 2020 programme: access pricing; RCV allocation; and RPI indexation.

RPI indexation

The RCV and its indexation by RPI, has been a key component of the regulatory framework for the water industry in the England & Wales and any potential change will be an extremely sensitive issue for companies, customers and investors alike. RPI indexation has been a fundamental factor in attracting investment while keeping the cost of capital low and customer bills affordable.

The indexation of the RCV is akin to a part-payment of a company's required cost of capital. That is to say that by creating an inflation-linked asset base, the return that customers pay companies in year has needed only to be the inflation-stripped real cost of capital and not the full value of companies' nominal interest payments to lenders or shareholders' nominal cost of equity. RPI is the measure of inflation by which Government debt is indexed and the indexed debt market is a key element of debt financing for water infrastructure investment. It remains the underpinning measure of inflation by which the market for inflation swaps is priced which is also key to effective debt risk management for water infrastructure.

In recent discussions with our investors future use of RPI is becoming a prominent area of debate and concern. Over recent years the water sector has been particularly attractive to pension funds. Much of this is down to the confidence in the RCV and the index linked returns, enabling investors to hedge against their future liabilities. Developments in the regulatory framework mean that Ofwat wishes to review alternative options. Jonson Cox recently asked the industry to participate in a ‘grown up and constructive debate as to how to move forward’ on this issue. It is important that we do this in a sensitive and transparent manner that acknowledges and addresses concerns of our investors.

We therefore commissioned First Economics to review the recent developments on RPI indexation, including precedent from other sectors, and present a balanced view of the issues for industry stakeholders and customers as well as potential alternative approaches *if* change were to be implemented. The report aims to identify the issues and assess the pros and cons of each of the various options.

The report considers the implications of a P_0 price increase upon a move to CPI to compensate for lower future RCV growth and the different options to mitigate the impact while maintaining investor confidence. There are three main areas we believe need careful consideration:

- The customer impact on short term affordability is a limiting factor.
- Investors will value certainty and are likely to heavily discount 'future promises' such as PAYG / RCV run off rate adjustments.
- Any options need to consider the impact on the current industry economic model where nearly all investment is funded by debt. We have previously raised the issue of the sustainability of this and the need for the equity RCV to grow at a sufficient rate to cover the cost of debt.

**Foreword from Dr. Tony Ballance, Director, Strategy & Regulation, Severn Trent
October 2015**

Alternatives to RPI Indexation

A report prepared for Severn Trent Water

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Foreword

During the last ten years, First Economics has written several papers on the implications of RPI indexation of regulated companies' price controls. Severn Trent Water has very kindly sponsored a new paper on this topic to consider the implications of Paul Johnson's recent call for a new approach to indexation. We are very pleased to contribute this paper to Ofwat's Water 2020 project.

John Earwaker, July 2015

1. Introduction

The question of whether price controls should index with RPI or CPI inflation has featured in numerous price reviews over the last 10-15 years. Until recently, regulators were unanimous in their view that RPI was the better index, but this consensus has started to fracture recently as the CAA, Ofcom and the Water Industry Commission for Scotland (WIC) have moved to setting CPI-linked price caps and as calls have grown from outside of the regulated sectors for a broader rethink of existing practices.

To aid those in the water industry who may be thinking about this subject as part of Ofwat's Water 2020 project, this report for Severn Trent Water considers the possible ways that there are of effecting a transition from RPI indexation to CPI indexation. We should be clear from the outset that in putting forward our analysis, we are not saying that a changeover should take place. Rather, the contribution that we seek to make in this report is to identify, describe and evaluate the ways that such a transition could occur so that all of the parties to the debate are properly informed about the choices that there are.

The paper is structured into six main parts as follows:

- in sections 2 and 3 we set the scene by looking at the pressures that RPI has come under recently and by reminding readers of the challenges that this brings for the water industry;
- section 4 sketches out a set of candidate options designed to address these challenges;
- section 5 brings out the financial impact that each option has for customers' bills;
- section 6 gives a broader evaluation of the pros and cons of each option; and
- section 7 concludes with a summary of our findings and recommendations.

2. Background

This report is not the first paper to look at possible alternatives to RPI indexation. For at least ten years, regulators and other stakeholders have spotted the increasing use that is being made of the CPI measure of inflation across the economy and have wondered if there will come a time when utility and transport industry price controls and regulatory capital values (RCVs) ought to be indexed to CPI rather than the more established RPI measure of inflation.

First Economics' most noteworthy contribution to this debate came in a 2011 UK Water Industry Research (UKWIR) study,¹ steered jointly by water companies and Ofwat. The main findings were documented as follows.

- *reported K-factors would be significantly higher if price controls were linked to CPI rather than RPI ...*
- *there would be a one-off 'P₀' increase in bills at the point when the industry switched from RPI to CPI ... and*
- *interest cover ratios would become healthier if price controls were linked to CPI rather than RPI ...*

This led to the following conclusions:

The prospect of a significant one-off increase in bills, followed by the presentational difficulties that would be caused by higher K-factors thereafter, was considered detrimental to all stakeholders. Customers, many of whom are already facing affordability issues, would suffer most obviously from higher prices (or from a reduction in outputs that might be triggered by a desire to avoid such increases). But companies and their investors also expressed concern during the study that the strict mathematical consequences of a change of index might not be easy to implement in the face of customer opposition, meaning that a switch from RPI might not necessarily be value neutral.

Companies and investors also expressed concern about the potential mismatch between price controls linked to CPI ... and borrowings that are linked to RPI. The existing stock of index-linked debt, much of which is long-dated, amounts to around one quarter of all debt that companies have outstanding. If the income coming in from customers and the payments that companies make to lenders were to index at different rates, there was widespread concern that companies might struggle to support this debt, would become less attractive to equity providers and would find it more difficult and/or more costly to raise new finance in the future.

The above considerations combined to give a sense that a switch from RPI would lack legitimacy in the eyes of many stakeholders. Accordingly, the study's conclusion was that CPI might be an appropriate index for a company that has not previously been privatised and regulated, but that the legacy of 20 years of RPI indexation makes a switch of index at this time unsettling, costly and detrimental to both customers and companies. To gain the necessary legitimacy for possible adoption in the future, CPI would need to gain a clear hegemony as the primary measure of inflation in the wider economy and such a development would need to be accepted by the investor community.

¹ UKWIR (2011), Alternative measures of inflation in the regulatory framework.

Since completing this work, there have been a number of new developments. The most significant was the 2012/13 review of RPI by the National Statistician, which found that the methods that are used to produce the RPI index do not meet international standards and, hence, RPI should not be thought of as an accurate measure of inflation.² This assessment prompted the UK Statistics Authority to withdraw RPI from the National Statistics, although the ONS continues to publish monthly RPI values on its website to assist government, businesses and other parties that have locked RPI adjustments into contracts.

More recently, the UK Statistics Authority commissioned Paul Johnson, Director of the Institute of Fiscal Studies, to consider the future usage of RPI.³ His conclusions were as follows:

The Authority and ONS should make it clear to users that the RPI is not a credible measure of consumer price change. The RPI should not be used for new contracts. Taxes, benefits and regulated prices should not be linked to the RPI. The RPI should also not be used as the measure of inflation when comparing living standards over time, at least for recent years where better consumer price indices are available.

This led him to make the following recommendation:

Government and regulators should work towards ending the use of the RPI as soon as practicable. Where they decide to keep using it the UK Statistics Authority should ask them to set out clearly and publicly their reasons for doing so. Where the Authority judges the continued use of the RPI to be inappropriate, it should say so.

The position at April 2015 has therefore moved on from the position in late 2011 when we carried out our study for UKWIR. In the new circumstances, this new paper seeks to identify the alternatives to current methods of RPI indexation and to evaluate their pros and cons.

² <http://www.ons.gov.uk/ons/rel/mro/news-release/rpirecommendations/rpinewsrelease.html>
The primary concern was the use of the arithmetic Carli formula for averaging prices.

³ Johnson (2015), UK consumer price statistics: a review.

3. A Reminder: The Differences Between RPI and CPI Indexation

Our 2011 report for UKWIR drew out the consequences that a straight switch from RPI to CPI indexation would have and serves as a useful reference guide for anyone that is encountering the RPI vs CPI debate for the first time. The key points may be summarised as follows.

1) CPI inflation runs naturally at a lower rate than RPI inflation

Due to their different formulae and compositions, RPI and CPI do not give the same readings of inflation even when fed by identical information about the prices of individual goods and services. In particular, RPI, as a measure of inflation that does not meet current international statistical standards, will normally produce inflation figures that are too high in comparison to the more accurate CPI measure. Over the long term, due to increases in house prices, RPI inflation will also be pulled up by the inclusion of mortgage interest payments from the RPI expenditure basket, while CPI inflation will be pulled down by the exclusion of housing costs from the CPI expenditure basket.

The scale of the 'wedge' between RPI and CPI inflation varies from month to month, but over long horizons a rule of thumb might be that CPI inflation of 2% per annum – i.e. in line with the UK government's inflation target – nowadays translates into RPI inflation of around 3.0% per annum.

2) A company's costs are not impacted by the choice of inflation index

The costs that a regulated water company incurs in providing services to customers comprise operating expenditures, capital expenditure, financing costs and tax payments. Importantly, the amounts of these costs are not generally influenced by whether Ofwat chooses to index in line with RPI or some other inflation index. Instead, for the purposes of the discussion that follows, a company's £m wage bill, contractor costs, electricity purchase costs, interest bill, cost of equity, tax liabilities, etc. can be thought of as exogenously determined amounts that are fixed (in nominal terms) outside of the regulatory system. This in turn produces a long-term revenue requirement which can also be thought of as having an exogenous £m value.

3) A switch to CPI indexation would mean higher K factors

The job for a regulator during a price review is to make sure that customers cover an efficient company's revenue requirement. The choice of inflation index can be seen to impact the regulator's calculations in two distinct ways.

First, when applying an inflation \pm K% formula to allowed revenues, the choice of inflation measure determines how much of an annual increase in revenue will come through to a company via year-on-year indexation of its maximum revenue cap. If a company's costs are fixed in nominal terms, it follows that the less revenue comes from indexation, the more of a K% adjustment the regulator needs to provide for in order for the company to cover its costs (and vice versa).

Because CPI inflation naturally runs at a slower rate than RPI inflation, K-factors under CPI indexation will typically be higher than K-factors under RPI indexation. In our 2011 UKWIR study, we showed that the relationship between inflation measure and K is close to one-for-one – i.e. if the gap between RPI and CPI inflation is 1.0 percentage points per annum, K factors will be not far from 1.0 percentage points higher with CPI indexation in comparison to K factors under RPI indexation.

4) A switch to CPI would require the regulator to provide for a P_0 increase

The second impact that inflation has on the price control calculation arises as a result of indexation of RCVs. Inflation indexation in this context is akin to a part-payment of a company's (nominal) cost of capital. That is to say that by creating an inflation-linked asset base, the return that customers pay companies in year needs only to be the inflation-stripped real cost of capital and not the full value of companies' nominal interest payments to lenders or shareholders' nominal cost of equity.

The respective sizes of inflation indexation and the inflation-stripped real cost of capital depend on the measure of inflation. If RPI is the chosen inflation measure, RPI indexation of the RCV is relatively valuable to the company and the inflation-stripped real cost of capital can be relatively low. Conversely, if CPI is the chosen inflation measure, CPI indexation is less valuable and the inflation-stripped cost of capital must be set at a higher level.

The relationship here is also broadly one-for-one, in the first instance: if the wedge between RPI and CPI inflation is 1.0 percentage points per annum, the real cost of capital under RPI indexation will be roughly 1.0 percentage points lower than the real cost of capital under CPI indexation. However, the arithmetic in terms of allowed revenues is not quite so straightforward. A 1.0 percentage point difference in the real cost of capital means the in year return in £m would currently need to be approximately three tenths higher (e.g. the difference between a 3.6% return on capital and a ~4.6% return on capital) if the regulator is indexing the RCV in line with CPI. This translates into a one-off P_0 increase of around 7% for customers, effective at the point when the regulator switches from RPI indexation to CPI indexation.

Commentary

The factors described above constitute a full and complete mathematical explanation of the ways in which prior knowledge of inflation indexation impacts on price control calculations and of the consequences that one would expect to see if a regulator were to adjust its choice of inflation index.

We note that in his recent Policy Exchange speech,⁴ Ofwat's Chairman, Jonson Cox, pondered aloud whether a switch from RPI to CPI indexation would be NPV-neutral in its effect. The preceding discussion shows that such a change *ought to be* NPV-neutral. The choice of inflation index impacts primarily on *how* revenue entitlement accrues to companies, i.e. via (a) the level of bills at the start of a control period and associated K-factors or via (b) annual indexation of allowed revenues and annual indexation of the RCV. It does not influence what that revenue requirement is. If a company's costs and required revenues are what they are, selecting an index that is expected to provide for less indexation simply means that a regulator must provide for more of a company's revenues via other means. There is no sense in which a change in indexation methodology can be said to bring about a reduction in cash operating expenditures, capital expenditure, financing costs or tax liabilities – i.e. there is no sense in which a judicious choice of inflation index can bring about a reduction in the underlying cost of providing water and wastewater services to customers.

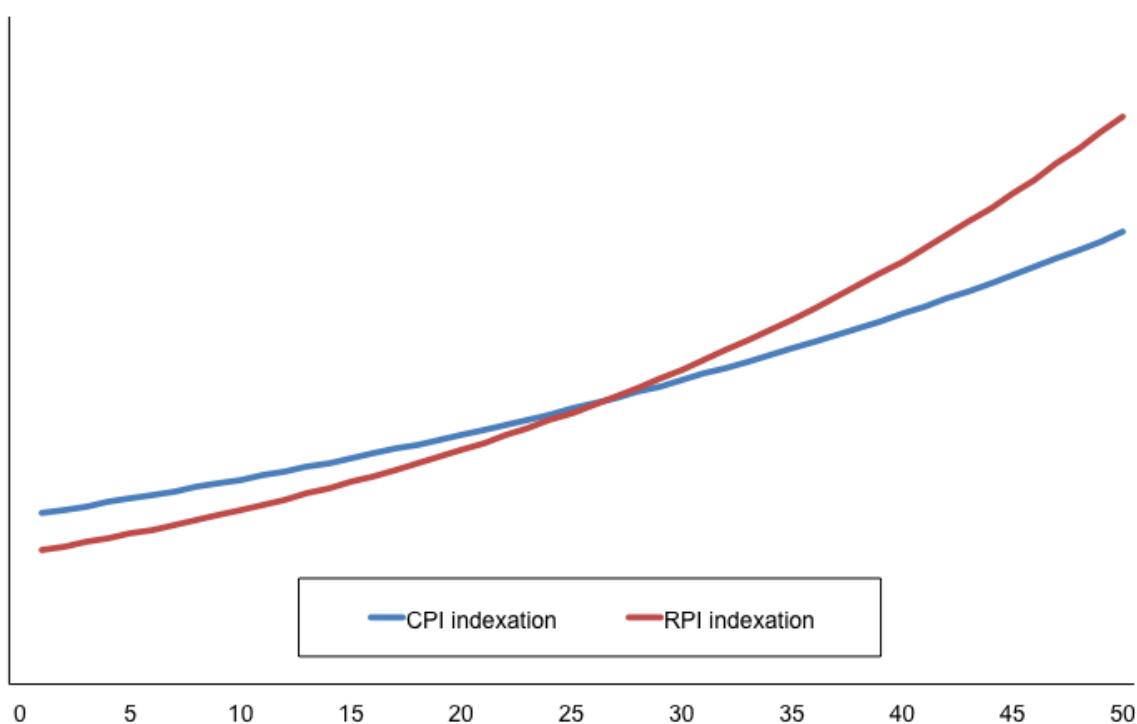
⁴ http://www.ofwat.gov.uk/mediacentre/speeches/prs_spe201503jonsoncoxpolicyexchange.pdf

Box 1: NPV-neutrality

Another way of showing that a switch between RPI and CPI indexation is NPV-neutral is to compare the profile of cashflows that is produced by: (a) the combination of a RPI-stripped rate of return and a RPI-linked RCV; and (b) the combination of a CPI-stripped rate of return and CPI-linked RCV. This comparison is given in figure 1, below.

The gap between the red line and the blue line at the start of the period is the P_0 increase referred to above. As time goes on, the more rapid indexation of the RCV under RPI indexation starts to offset the impact of a lower RPI-stripped cost of capital, until at some point around year 25 there is a cross over and the revenue requirement produced by combination (a) exceeds the revenue requirement produced by combination (b).

Figure 1: Allowed returns in £m under RPI and CPI indexation



Note that the present value of cashflows in the red line is identical to the present value of cashflows in the blue line.

The maths here should not really be a matter for dispute. However, during our UKWIR study, companies were concerned that K-factor and P_0 adjustments would not actually play out in the way that we describe if the industry were to switch to new indexation rules. In particular:

- companies worried that they and/or Ofwat might find higher K-factors difficult in presentational terms. Referencing RPI as the measure of inflation makes it relatively easier for companies and Ofwat to announce that they are holding bill increases below the rate of inflation. Using CPI as a yardstick makes it more likely that companies will have to announce that bills are to rise faster than inflation. (To use an example that post-dates our report, Ofwat’s headline PR14 5% real terms reduction in bills might

well have been a real terms *increase* in bills had Ofwat used CPI as its reference for inflation.); and

- more substantively, it is inconceivable to think that the industry could push through one-off P_0 increases of 7%, especially when the source of the increase lies in a very technical aspect of price-setting methodology rather than anything that consumers would recognise as a genuine new cost.

The fear among companies in 2011, therefore, was that what ought to be a NPV-neutral change in price control index would turn out in practice to be NPV-negative. This might be because Ofwat would feel it necessary to squeeze down on costs and/or outputs, more so than in otherwise would, in order to offset the effects described above. Or it could be because Ofwat would simply be unwilling to increase the (real) cost of capital by the full amount required to offset the slower indexation of the RCV.

We had some sympathy with this viewpoint in 2011 and we still have the same sympathy today, particularly in relation to the challenges that there are in switching from a RPI-stripped cost of capital to a significantly higher CPI-stripped cost of capital. The way that we would put it is that today's customers obtain a great deal of (possibly unjustified) benefit from Ofwat's historical practice of splitting remuneration of the nominal cost of capital into RPI indexation of the RCV and an RPI-stripped cost of capital. To take this benefit away from customers abruptly would provoke opposition even if it can be shown that the cost to current customers is matched by an equal and offsetting benefit accruing to future customers (see Box 1 above).

This means that it is far from straight-forward to know how best to respond to any imperative that there might be to move away from RPI indexation. In the next section of the report we consider the range of options that there might be for the water industry, focusing especially on approaches which avoid a large, one-off P_0 adjustment (as the central challenge that a switch from RPI to CPI indexation would bring).

4. Candidate Transition Options

Our list of candidate options is as follows.

4.1 Option 1

In annex 1 to this report, we document the response that the CAA developed when compelled by the European Commission to index NATS' main price control by reference to CPI. The key features of the CAA's methodology are that:

- the regulatory charge restriction is defined as CPI + K% cap on average prices; but
- allowed revenues are still set in such a way as to provide in year for an RPI-stripped cost of capital while NATS' RCV still indexes in line with RPI.

The CAA's methodology, in effect, seeks to calibrate the K values in the CPI + K% formula so that NATS expects prior to the start of the control period to get exactly the same amount of (nominal) revenue as it would under an RPI + K% formula. It is only therefore if inflation turns out to be different from the CAA's forecasts that the change from RPI to CPI indexation has any financial impact on NATS – i.e. if CPI turns out to be higher (lower) than expected, NATS benefits (suffers) from additional (less) revenue according to the difference between actual and forecast CPI inflation rather than the difference between actual and forecast RPI inflation.

This is a methodology that could also conceivably be applied when setting future water and wastewater price controls.

4.2 Option 2

The natural next extension of this approach is for a regulator to consider preserving RPI indexation for the existing RCV but moving to CPI indexation, and by implication a CPI-stripped cost of capital, for new RCV additions.

Using this approach, the return of and on historical investment would continue along an undisturbed path, with customers paying similar amounts of in-year £m return to companies before and after the switch. For new investments, however, the switch to CPI indexation would mean that consumers pay a higher real rate of return on new expenditure with correspondingly lower CPI indexation of the corresponding pieces of the RCV.

Given the size of the existing RCV relative to ongoing expenditure, the effect of this policy would initially be quite small, but the impact would grow gradually over time as the proportions of old investment and new expenditure within the RCV evolved.

4.3 Option 3

The industry might consider going one step further than option 2 and provide for some of the existing RCV to switch from RPI indexation to CPI indexation. The exact proportion could be any amount of the industry's choosing. To fix ideas, our analysis of option 3 in this paper provides for RCV that is matched by RPI index-linked debt to remain linked to RPI and for all other RCV to move to CPI indexation. To be internally consistent, there would be a corresponding weighting between the amounts of RPI-stripped cost of capital and CPI-stripped cost of capital.

At the time of writing, the stock of index-linked debt within the industry is worth approximately 20% of the combined industry RCV. This means that option 3 would provide for a 20:80 split between RPI and CPI indexation.

4.4 Option 4

An entirely different approach would be to phase in CPI indexation over a period of several years. By way of an example:

- in year 1, the industry could provide for 90% of allowed revenues and 90% of the RCV to remain locked into RPI indexation but for the remaining 10% of revenues and RCV to index in line with CPI;
- in year 2, the percentages could go to 80% and 20%;
- in year 3, the split would be 70%/30%; and so on until
- in year 10, all revenues and all of the RCV would be indexed by CPI.

As in the previous options, the proportion of RCV that indexes with RPI would be matched with an RPI-stripped cost of capital and the proportion that indexes with CPI would be matched with a CPI-stripped cost of capital.

4.5 Option 5

A fifth option that we can envisage involves an immediate switch to CPI for all revenues and all of the RCV, but with adjustments either to the pay-as-you-go percentage or to the RCV run-off rate to offset all or some of the consequent P_0 increase that we highlighted in section 3.

The thinking behind this approach would be that a switch from RPI-linked RCVs and an RPI-stripped cost of capital to CPI-linked RCVs and a CPI-stripped cost of capital would be akin to a decision that rewards companies with more 'fast' money and less 'slow' money. Rather have a particular rebalancing forced upon it, it could be said that the industry should decide unconstrained how much, if at all, it wants there to be a change in prices. The pay-as-you-go percentage and the RCV run-off rate give the industry levers with which to make such choices.

4.6 Summary

Table 1 gives an overall summary of the above options against a base case of retaining full RPI indexation and an extreme case of straight CPI indexation.

Table 1: Overview of candidate indexation options

Option	CPI + K% or RPI + K% formula for allowed revenues?	RPI or CPI indexation of RCVs?	RPI- or CPI-stripped cost of capital?
Base case: full RPI indexation	RPI + K%	RPI	RPI
Option 1: CAA methodology	CPI + K%	RPI	RPI
Option 2: CPI indexation for new RCV additions	CPI + K%	Both	Both
Option 3: RPI indexation for RCV backed by index-linked debt only	CPI + K%	Both	Both
Option 4: 90:10, 80:20, etc. RPI:CPI transition	CPI + K%	Both	Both
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	CPI + K%	CPI	CPI
Extreme case: full CPI indexation	CPI + K%	CPI	CPI

5. Modelling

5.1 Overview

The candidate options, by design, have different financial impacts on companies and consumers. In this section, we take a high-level look at these impacts, focusing especially on necessary P_0 adjustments and the change to headline K-factors.

To make the analysis as clear and as understandable as possible, we put forward the following thought experiment: what would PR14 have looked like if Ofwat had used the options in section 5 rather than straight RPI indexation? This formulation means that we show the effect of a hypothetical change in indexation at the current time using current industry financials. It should be noted the passage of time means that the precise numbers will change especially if the industry delays the start of the transition from RPI by two, three or more control periods. However, notwithstanding this caveat, the broad effects that we describe below will continue to be apparent.

5.2 Assumptions

The analysis is based on the simple financial model that we developed during our 2011 UKWIR study. The numerical results are sensitive to two main sets of assumptions:

- the composition of a company's allowed revenues, and especially the proportion of allowed revenues that are attributable to the return on the RCV; and
- the gap between forecast RPI inflation and forecast CPI inflation.

On the first of these points, for this paper we focus on industry allowed revenues. In Ofwat's wholesale PR14 determinations, the allowed return contributed approximately one fifth of total wholesale revenues.

On the second point, we think it is most helpful to model the differential between RPI inflation and CPI inflation over a long time horizon. The Office for Budgetary Responsibility published analysis earlier this year⁵ which concluded that the government's 2.0% per annum CPI inflation target can be thought of as translating into RPI inflation of around 3.0% per annum. On the basis of this analysis, we think that 1.0% per annum is a reasonable estimate of the 'inflation shock' that the industry would have to deal with in future when switching from RPI to CPI indexation.

5.3 Results

Table 2 overleaf depicts a set of alternative PR14 determinations for each of our candidate indexation options. The first column in the table gives the P_0 increase that the choice of indexation methodology produces. The second column shows how headline K factors would look relative to CPI inflation.

(NB: in principle, it is possible to report K-factors relative to RPI inflation or relative to a weighted average of RPI and CPI inflation in any of the options. We think that a common CPI + K% characterisation is helpful and, indeed, necessary given the difficulties that Ofwat and companies are going to increasingly have in the future if they attempt to present bill increases relative to the statistically invalid RPI inflation measure.)

⁵ Office for Budgetary Responsibility (2015), Economic and fiscal outlook – March 2015.

Table 2: Alternative PR14 outcomes

	P₀ change due to indexation methodology	Average K factors, 2016/17 to 2017/18
Base case: full RPI indexation	-	RPI + 0.4% CPI + 1.4%
Option 1: CAA methodology	-	CPI + 1.4%
Option 2: CPI indexation for new RCV additions	+0%	CPI + 1.7%
Option 3: RPI indexation for RCV backed by index-linked debt only	+6%	CPI + 1.2%
Option 4: 90:10, 80:20, etc. RPI:CPI transition	+1%	CPI + 2.1%
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	-	CPI + 1.4%
Extreme case: full CPI indexation	+7%	CPI + 1.2%

Source: First Economics' calculations.

The general shape of these results may be explained as follows:

- the P₀ increase is determined principally by the proportion of RCV that indexes with CPI rather than RPI and, by implication, the amount of CPI-stripped rather than RPI-stripped return. A switch from full RPI indexation to full CPI indexation increases the real cost of capital from 3.6% to around 4.6%. This is equivalent to an increase in the allowed return in £m of just under three tenths. With allowed returns originally accounting for one fifth of industry allowed revenues, the P₀ effect is approximately 30% x 20% = 6% plus an allowance for additional tax payments = ~7%. Options 2 to 4 moderate this jump in revenue requirement to different degrees by providing for only a partial switch to CPI indexation,⁶ while option 5 consciously neutralises the higher return with a reduction in the amount of fast money; and
- the K-factors show how lower inflation indexation must be compensated via a broadly commensurate increase in a company's K-factor. The two exceptions to this rule of thumb are options 2 and 4, where the year-on-year increase in the proportion of CPI-stripped cost of capital creates what might be thought of as a series of mini-P₀ increases over a period of ten years or more, especially in the case of option 4.

Note that the figures quoted above are industry averages. The size of the P₀ changes, in particular, vary from company to company, with companies that have relatively large RCVs in comparison to ongoing costs and revenues seeing larger impacts and companies that have relatively small RCVs in comparison to ongoing costs and revenues seeing smaller impacts.

⁶ In option 3, the cost of capital is a 20:80 RPI:CPI-stripped cost of capital. In option 2, the weights are 98:2 in year 1. In option 4, the weights are 90:10 in year 1.

6. Evaluation

Having identified what the different candidate options do, we can now start to evaluate their pros and cons.

6.1 Criteria

The criteria that we think are relevant here are as follows (NB: these are the same criteria that we used in our 2011 UKWIR study).

1. Appropriateness of the inflation index to water and sewerage costs
2. The direct, short-term impact on affordability
3. Impact on financeability
4. Practicability and simplicity
5. Legitimacy

A more detailed explanation of each of these considerations is set out below.

6.1.1 Appropriateness to water and sewerage costs

In a report looking at the merits of alternative inflation indices it is natural to start the evaluation with a look at the match of each candidate index to industry costs. It is unlikely that any index is going to mirror costs exactly; instead, the question is whether the indices are more or less likely to give unexpected/windfall gains and losses due to factors that move the index but not costs (or vice versa).

Such considerations are relevant to both shareholders and customers. The former would normally wish to avoid random outcomes that have a significant effect on out-turn returns. The latter generally appreciate smooth prices and expect regulation to pass a basic test of fairness.

6.1.2 Direct, short-term impact on affordability

Although the interests of customers underpin all of the chosen criteria, arguably the most important consideration from the consumer's perspective is whether a candidate option will trigger a change in bills at the time of the policy switch. A candidate option with strong economic and regulatory credentials is much less attractive, at least at the current time, if it implies higher prices in the short term. Conversely, proposals that can alleviate affordability constraints in the next one or two control periods will score well for this reason alone.

6.1.3 Impact on financeability

A criterion relating to financeability is a necessary counterweight to considerations of affordability. Just as Ofwat's statutory duties require it to balance the interests of customers with the job of securing that companies are able to finance their activities, we must also consider if any candidate option will adversely affect either the availability of capital or the price of that capital.

Factors that may be relevant here include:

- the effect on key financial ratios and credit metrics;
- any increase or reduction in shareholders' exposure to risk; and

- changes in investor perceptions more generally of the regulatory regime and the quality of companies' future cashflows.

It is also necessary to consider, as matter in its own right, the implications the candidate options have for current and future index-linked debt.

6.1.4 Practicability and simplicity

There is a view that economic regulation has become too complicated and needs to be simplified going forward. Any change in indexation methodology need to be in tune with this overall message and should seek where possible to avoid adding to the burden placed on either Ofwat or the companies it regulates.

Even without this imperative, it would be desirable to put in place regulatory mechanisms which are simple to operate, transparent and easy to understand. Complex inflation indexation calculations might not therefore be as useful as they first seem; rather there is something to be said for simplicity provided that a candidate index scores reasonably well against other criteria.

Specific practical issues include the timeliness of publication of indices, their independence, the constancy of their definition and their proneness to retrospective revisions.

6.1.5 Legitimacy

The last of the five criteria deliberately assesses the likely stakeholder reaction to the different candidate indices. One of the key themes that came out of our 2011 UKWIR study was the very clear message that stakeholders consider RPI indexation to be a cornerstone of the regulatory framework. It is therefore important to consider whether proposals for change might jeopardise stakeholders' trust in the system.

6.2 Assessment

We now consider the candidate indexation options against these criteria.

6.2.1 Appropriateness to water and sewerage costs

RPI and CPI are both indices of the cost of a typical basket of household goods and services. The goods and services within the expenditure of companies in the water sector bear only limited resemblance to those in the basket of individual consumers. Accordingly, there are a whole range of reasons why movements in the candidate inflation indices might not at any given time mirror movements in companies' costs.

There is nevertheless a clear justification for using consumer inflation indices to adjust companies' prices on the grounds that they represent easily understood and readily recognisable measures of the overall level of inflation in the economy. With this in mind, the most useful way to assess the relative appropriateness of RPI and CPI is to focus on their differences and to evaluate whether these distinguishing features are helpful or unhelpful to companies and customers.

On this criterion alone, options that involve RPI indexation have problems. As we noted in section 2, and as others have started to stress in recent months, RPI does not give valid measures of inflation. Indexing water industry revenues and RCVs to RPI may therefore be said to be flawed due to indexing to a poorly structured set of numbers, whose values may be difficult to understand or interpret.

CPI inflation may not precisely mirror what it happening to industry costs but it does have the advantage of being a valid statistical measure of economy-wide inflation. Insofar as there is

at least some relationship between industry expenditure and economy-wide inflation, there is therefore a greater justification for CPI indexation on the grounds of appropriateness to industry costs.

This means that the candidate options can be ranked according to the weights given to RPI and CPI, with options that give more weight to CPI scoring better.

Table 3: Rankings for appropriateness to industry costs

	Ranking
Option 1: CAA methodology	6
Option 2: CPI indexation for new RCV additions	5
Option 3: RPI indexation for RCV backed by index-linked debt only	4
Option 4: 90:10, 80:20, etc. RPI:CPI transition	3
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	1=
Extreme case: full CPI indexation	1=

6.2.2 Direct, short-term impact on affordability

Section 5 of this paper set out the impact that the candidate options would have on companies' revenues and customers' bills. The clear finding was that any move to CPI-stripped cost of capital would imply a P_0 increase, unless Ofwat used the pay-as-you-go percentage and/or the RCV run-off rate to neutralise the P_0 effect.

This means that the candidate options rank in the exact reverse order to the previous criterion, except for option 5 which again ranks highly due to the way in which the adjustment(s) to the speed of money neutralise the P_0 increase that would otherwise result from CPI indexation.

Table 4: Rankings for affordability

	Ranking
Option 1: CAA methodology	1=
Option 2: CPI indexation for new RCV additions	3
Option 3: RPI indexation for RCV backed by index-linked debt only	5
Option 4: 90:10, 80:20, etc. RPI:CPI transition	4
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	1=
Extreme case: full CPI indexation	6

6.2.3 Impact on financeability

The assessment of financeability comes in two parts.

Direct effect on financial ratios

The first effect to consider involves the impact that the P_0 increases identified in section 5 have on interest cover. As a rule, higher prices and higher revenues have a positive impact on the numerator in any interest cover calculation. This means that, if one assumes that the P_0 increases are practically implementable, the financial constraints and pressures on company's credit ratings will ease as the industry transitions more of its RCV and associated return to CPI indexation.

Our modelling shows that the boost to post-maintenance interest cover – a key ratio in the eyes of the rating agencies – might be as much as 0.3x in the case of a switch to full CPI indexation. Other options which involve a lesser degree of CPI indexation of the RCV exhibit a small, but still positive change in interest cover ratios.

Table 5: Rankings for financeability – interest cover

	Ranking
Option 1: CAA methodology	6
Option 2: CPI indexation for new RCV additions	5
Option 3: RPI indexation for RCV backed by index-linked debt only	3
Option 4: 90:10, 80:20, etc. RPI:CPI transition	4
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	1=
Extreme case: full CPI indexation	1=

(NB: there is less pronounced effect on gearing ratios. Although RCVs grow more slowly when there is CPI indexation, the 'lost' RCV growth is matched pound-for-pound with higher in-year revenue, which means that a company's borrowings also grow more slowly. As a first approximation, the lower RCVs and lower net debt under CPI indexation cancel each other out to leave gearing ratios broadly unchanged.)

Index-linked debt

Over the last 15 years the water and sewerage sector has been a major borrower of RPI-denominated index-linked debt. The sector has been able to raise debt in this way largely because of the index-linking of its revenues and RCVs to RPI. This property has given comfort to investors that their profile of debt service and repayments will be supported by matching corporate cash flows and has further benefitted companies' financial ratios by profiling some of their interest costs in the same way as their returns.

Whilst index-linked issuance has reduced since the onset of the global financial crisis, many companies have significant amounts of index-linked debt on their balance sheets which they still need to service. It should not be surprising therefore that the investors have previously raised concerns over the effect of moving away from RPI indexation. Adopting an alternative index has the potential to create a degree of mismatch between the profile of companies' returns and their index-linked interest costs, which would not only make raising new RPI-linked debt more difficult in the future but could also cause problems for the maintenance of such debt currently on companies' balance sheets.

Looked at from this perspective, the candidate options that involve full CPI indexation are less attractive. One interesting question that we think merits detailed further investigation is whether investors would be content with an indexation methodology which involves partial RPI and partial CPI indexation. There are two aspects to this:

- if there is RPI-linked RCV of equivalent value to a company's RPI-linked liabilities, will investors care whether the rest of the RCV, along with the non-return components of allowed revenues like opex, index with CPI? If they do, what would be the basis for their concerns? and
- in options where the whole of allowed revenues index with CPI, there is the potential for 'holding gains' and 'holding losses' within period whenever (a) RPI inflation departs from the regulator's upfront forecasts and (b) the unexpected move in RPI is not matched by an identical unexpected move in CPI. Suppose, for example, that RPI inflation moves above forecast by 0.5% but CPI remains in line with a regulator's original projections. No change in CPI means no extra revenues, even when the RPI-indexed value of borrowings increases above forecast and triggers a small increase in annual interest payments. Would investors worry about this or would the effect typically be so small as to be judged as 'noise'?

There is also a question in our mind about companies' ability to extricate themselves from RPI-linked obligations. Early redemption of RPI-linked debt is likely to be expensive in current market conditions, but there could conceivably be some sort of swap arrangement with third parties. Our understanding is that the market for RPI-CPI swaps is not currently very deep, but in future it could be that there is greater opportunity for companies in this area. One could imagine Ofwat recognising the costs of such action in its price control calculations as part of a coordinated industry-wide exit from RPI-linked debt.

We have not discussed these issues with investors as part of this project. This may be something that the industry wishes to pursue further in the near future, with a view to understanding better whether it is RPI indexation in its totality that investors consider is valuable or whether investors need only to see an RPI-linked asset with a value that comes up to (but does not necessarily exceed) the value of RPI-linked liabilities.

Pending this clarity, we provisionally rank the candidate options in the following order. The rankings reflect the cover that there is for RPI-linked debt in the form a matching RPI-linked asset.

Table 6: Rankings for financeability – cover for index-linked debt

	Ranking
Option 1: CAA methodology	1
Option 2: CPI indexation for new RCV additions	2
Option 3: RPI indexation for RCV backed by index-linked debt only	3
Option 4: 90:10, 80:20, etc. RPI:CPI transition	4
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	5=
Extreme case: full CPI indexation	5=

We note that these rankings will be of greatest concern to the companies that have the largest stocks of index-linked debt.

6.2.4 Practicability, simplicity and clarity

At a practical level, there is currently little to choose between the candidate options. While it might be argued that options which combine elements of RPI and CPI are messier than full RPI indexation or full CPI indexation, we do not think that such complication should be overstated when set against the genuinely complex aspects of Ofwat's price setting methodology (e.g. totex benchmarking, equalised incentives, menu regulation, etc.).

This causes us to rank the candidate options equally.

6.2.5 Legitimacy

The final criterion has several different layers to it.

Legitimacy of RPI indexation – customers' view

RPI indexation has for 30 years provided one of the foundations on which the UK system of economic regulation is built. However, with the recent attention that has been paid to the RPI formula, it is becoming much more difficult to justify why bills should be linked to a statistically invalid measure of inflation. For instance:

- we would argue that it is already no longer tenable to tell customers that their bill is increasing by less than inflation, if by 'inflation' the company or regulator making the announcement is referring to RPI inflation. Other organisations have started to be picked up on this⁷ and, in our view, Ofwat was very lucky not to draw more criticism in December 2014 when it characterised the outcome of PR14 as a 5% reduction in bills before adjustments for inflation (as noted earlier in the paper, in reality PR14 most likely provides for bills that will rise above the rate of CPI inflation);
- we also find it difficult to explain why the value of RPI should be the determining factor when considering how much of a company's nominal cost of capital should be paid in year and how much should be paid for by RCV indexation. If RPI inflation is likely to run at 3.0%, relative to long-run CPI inflation of 2.0%, it seems to us that current customers are being asked to make a disproportionately low contribution to the cost of financing investment and are in effect benefiting from a cross-subsidy from future customers; and
- these two problems have been exacerbated by the increase in the 'formula effect' following changes that the ONS made to its approach to price measurement in 2011. Looking forward, the likelihood that RPI will shift trajectory as a result of other technical changes in ONS methodology is quite high.⁸

We think that these things together are going to come together, if they haven't already, to make RPI indexation a much less legitimate approach in the eyes of customers and outside observers. It follows that observations of the type that Paul Johnson has set out will continue to be made of the RPI links in the regulated industries, especially where they are very visible to customers.

⁷ See, for example, the exchange of correspondence over the government's announcement of 2015 regulated rail fares [here](#) and [here](#).

⁸ Paul Johnson makes this point on p.14 of his report. The ONS will make continual improvements to its approach to estimating CPI inflation but intends to fossilise the RPI methodology, meaning that here is scope for the formula effect to widen and narrow in an unpredictable fashion.

Legitimacy of CPI indexation – investors

Investors will have a different perspective. RPI has a track record as the main index of the water sector, and nearly all other regulated sectors. Its presence is treated as one of the defining features of the regulatory regime, evidenced in the terminology of ‘RPI-X’ regulation. RPI therefore has significant legitimacy in playing its current role. The question is whether CPI would have the necessary legitimacy to replace it?

At one level, investors are more likely to consider CPI a legitimate replacement for RPI the more that they encounter CPI in day-to-day life (e.g. in newspapers, in economic and fiscal analysis, in the pension liabilities they might be having to deal with and perhaps, eventually, in the index-linked gilts that the UK government sells). It was for this reason that we talked in our 2011 UKWIR paper of needing to see a hegemony of CPI over RPI prior to any switch in the water industry’s indexation rules.

It is also clear that investors need to be convinced that Ofwat will be fair and even-handed during the transition from RPI to CPI and beyond. When we looked at this in our 2011 UKWIR study, as recorded earlier in the paper, we were met with the clear view that Ofwat might well treat the switch from RPI to CPI indexation as an opportunity to bring bills down by back-handed means. Companies argued, in particular, that the unpalatability of the reported K-factor increases and P_0 changes, where applicable, would lead Ofwat to use whatever discretion it had in effecting the switch of index to minimise the adverse movement in these variables (e.g. a tougher stance on the cost of capital or the imposition of tougher efficiency targets). This led to anxiety about possible loss of value in a change that ought otherwise to be value neutral.

For such a change to have legitimacy would require these concerns to be credibly allayed and for Ofwat to find a way to reconcile the pressures it faces in a proper and fair way. This is to a large extent what this contribution to the Water 2020 project has been about – i.e. the candidate options that we set up in section 4 are all intended to dilute the P_0 increases that would come about when making a straight switch from RPI indexation to CPI indexation. However, it is apparent that none of our options are perfect:

- options 1 to 3 all rely on retaining an element of RPI indexation indefinitely;
- options 3 and 4 only partially or temporarily offset the P_0 increases that a switch to CPI indexation and CPI-stripped costs of capital brings; and
- option 5 involves making a sizeable and highly artificial manipulation to the allowed revenue calculation to neutralise the upward pressure on bills (i.e. in excess of £3 billion at industry level in each control period, equivalent to a 10 percentage point increase in the pay-as-you-go percentage or a 1.5 percentage point increase in the RCV run-off rate).

This means that none of the ideas we are putting forward in this report score perfectly against a criterion of legitimacy.

Overall assessment

What we see here is that there is an unavoidable tension in any feeling that the existing RPI links in the regulatory framework do not operate in the best interests of current and future customers, on the one hand, and a desire to avoid the problems that a P_0 increase would cause, on the other. The conflict here is arguably irreconcilable. If RPI indexation is felt not to be a legitimate inflation measure but happens to have the attribute that it keeps current bills low, one cannot decide that the industry ought to switch to a better measure of inflation but without any change in prices. We are dealing here with two sides of the same coin.

This causes us to look at the candidate options in the following terms:

- options 1 and 3 need to be regarded as half-way houses, of varying degrees, which help the industry begin the journey away from RPI to CPI but which postpone to a later date the need to confront in full the legacy effects of RPI indexation; and
- only options 4 and 5 can properly be labelled transitional approaches, in that they bring about an elimination of all RPI links (although there is a question in our mind about whether option 5 represents a full transition given the neutralisation of the switch from an RPI-stripped rate of return).

We would suggest that the order of preference for the options should depend on how strong the desire to move away from RPI is. It is difficult to be definitive about this ahead of a promised consultation by the UK Statistics Authority in the summer about the usage of RPI. Our sense at the time of writing is that we are not at a point where RPI is likely to be discontinued as an index or where there is overwhelming pressure to break every RPI link in the regulated sectors (and beyond).⁹ Our instincts, therefore, are that the candidate options with the greatest legitimacy at the current time will be those options which start to swap RPI for CPI but not necessarily in full so as to avoid to major P_0 adjustments.

This gives is the rankings set out below.

Table 7: Rankings for legitimacy

	Ranking
Option 1: CAA methodology	1=
Option 2: CPI indexation for new RCV additions	1=
Option 3: RPI indexation for RCV backed by index-linked debt only	5
Option 4: 90:10, 80:20, etc. RPI:CPI transition	4
Option 5: full CPI indexation with offsetting adjustments to pay-as-you-go percentage or RCV run-off rate	3
Extreme case: full CPI indexation	6

⁹ Note that the Statistics and Registration Services Act imposes a legal obligation on the ONS to compile, maintain and publish the RPI index.

7. Conclusions and Recommendations

We hope that what this report has done is to identify the alternatives that there are to straight RPI indexation and to highlight how there are costs and risks for all stakeholders in any kind of switch to one of these other options. The fact that there is no perfect, downside-free way of effecting a transition from RPI to CPI suggests to us that all parties should approach any discussion about alternative indexation methods with great caution.

The evaluation criteria given in section 6 of this paper do not point in unison at one candidate option over the other alternatives. That said, we can give the following summary:

- the 'CAA methodology' of providing for a CPI-linked price cap, while retaining a RPI-stripped cost of capital and RPI-linked RCV, looks to be the most straight-forward of the options. It might best be described as a repackaging of a regulator's normal price review calculations, in that companies will expect to receive the revenues that would accrue to them under conventional RPI indexation but do not need to present customers with an explicit annual RPI adjustment to bills;
- if there were a need to look beyond the formula for determining annual price adjustments, it is possible to envisage a whole range of ways of making a gradual transition from RPI to CPI indexation. We have depicted two main options in this paper – involving CPI indexation for new RCV additions and the 90:10, 80:20, etc. blending of RPI and CPI – but in practice these are both very arbitrary mixes and it is open to the industry to turn up CPI and turn down RPI at any pace of its choosing, depending on circumstances;
- if there were a need to move away from RPI very quickly, option 5 in our list shows that the industry could neutralise any impact on revenues and bills by its new controls over the mix of fast and slow money. This is not costless, however and investor and rating agency reaction to such manipulation would need to be properly understood; and
- all of the above options rank superior to a straight switch to CPI indexation and the prospect of having to deal with an industry-wide P_0 increase of 7%.

Annex 1: The use of CPI in Other Sectors

Three UK regulators (to date) have switched in full or in part from RPI indexation to CPI indexation of price caps:

- the Civil Aviation Authority (CAA) in its regulation of National Air Traffic Services;
- Ofcom in its calculations of telecoms price controls; and
- the Water Industry Commission for Scotland (WIC) in its most recent review of Scottish Water's price limits.

We explain below how the transitions were structured.

CAA

The first UK regulator to set a CPI-linked price control was the CAA in its regulation of NATS. The switch to CPI came as a result of a 2010 European directive that harmonises charging arrangements across Europe. Part of this harmonisation required that providers of air navigation services link their prices to the index of inflation recorded by Eurostat – i.e. CPI and not RPI.

The CAA's approach to setting a CPI-linked price control comprised three steps as follows:¹⁰

- step one – the CAA calculated what NATS' real revenue requirement would be if it could stick with RPI as its measure of inflation (i.e. it ran its regulatory model exactly as it would have if there was to be an RPI-linked price control);
- step two – the CAA converted this real revenue requirement to a nominal/out-turn equivalent using forecasts of RPI; and
- step three – the CAA deflated the calculated nominal revenue requirement using forecasts of CPI, thereby giving a real revenue requirement in CPI-stripped terms and a CPI – X% price control formula.

(NB: because the RPI inflation forecasts exceeded the CPI inflation forecasts, the X-factors at the end of step three were higher than they would have been under an RPI – X% design.)

It can be seen from the above explanation that the real, inflation-stripped rate of return in the CAA's price control calculation was an RPI-stripped cost of capital. To be internally consistent, the CAA then indexed NATS' regulatory asset base in line with RPI during the price control period even as the main price control indexed in line with CPI.

The CAA acknowledged when it made the switch that its approach leaves NATS with the risk that the gap between RPI and CPI narrows or widens unexpectedly during the control period. NATS was able to obtain quotes for a bespoke financial instrument that would allow it to hedge this risk at a cost of £1-2m per annum. The CAA added this amount to NATS' revenue requirement so as to enable NATS to either hedge or bear the risk itself as it considers appropriate.

The CAA originally stated that all of the above arrangements were transitional and that it would consider its approach from first principles ahead of the review of NATS' 2015-19 price controls. In fact, the CAA has stuck with its 2010 methodology unchanged and issues around indexation have attracted relatively little comment and debate.

¹⁰ CAA (2010), NATS (En Route) plc price control review: CAA formal proposals for control period 3.

Ofcom

Ofcom began the process of switching from RPI – X to CPI – X charge controls in 2014, starting with BT's wholesale line rental, local-loop unbundling and wholesale broadband access charge caps.

Ofcom has always stood apart from the other UK regulators by virtue of its practice of providing within most of its price caps for a nominal rate of return. This was the starting position in all of the above-mentioned price reviews – i.e. Ofcom previously provided for BT's full nominal cost of capital to be paid for in year when it set RPI – X charge caps and thus continued to provide for the full nominal cost of capital when setting CPI – X charge caps. The choice of RPI vs CPI was therefore relevant only in describing glidepath that prices travel on over a control period, not the level of those prices per se.

The position is slightly different in Ofcom's ongoing review of mobile call termination charges. In this corner of its work, Ofcom always previously allowed for an RPI-stripped cost of capital within an RPI – X price control framework. In its latest March 2015 Statement, Ofcom has for the first time provided for a CPI-stripped real cost of capital within a CPI – X price control framework.¹¹ This is equivalent to the 'full CPI indexation' option in the main body of this report.

The WIC

The WIC moved away from RPI indexation in its 2014 determination of Scottish Water's price controls.¹²

The WIC's methodology in this review was generally very different from the methodology applied in previous reviews and from the methodology used by Ofwat in the parallel PR14 review. Specifically, the WIC chose at an early stage in the review to recognise that Scottish Water is a government-owned company which borrows from the Scottish government on very tightly controlled terms and which therefore faces much more rigid constraints around cashflow compared to companies in England & Wales. Rather than calculate a revenue requirement from the sum of allowances for operating costs, depreciation, return and tax, the WIC acknowledged that the price control arithmetic for Scottish Water necessarily involved a balancing of:

- cash outflows, in the form of operating expenditures, capital expenditure, interest payments and tax payments; and
- cash inflow, in the form of revenue from customers and agreed new borrowing.

It can be seen that the concepts of return of and on the RCV do not enter this cashflow-focused equation. As such, it wasn't necessary for the WIC to calculate a cost of capital or to worry about RPI- vs CPI-stripped options.

Indexation was, however, a consideration when looking at the revenue from customers component of cash inflow. The WIC elected in its determination to set a profile of bills in which:

- household charges are permitted to rise by no more than CPI – 1.8% over the whole of the 2015-21 period, with maximum annual increases of 1.6% in 2015/16, 2016/17 and 2017/18 and CPI – 0.3% in 2018/19, 2019/20 and 2020/21; and
- non-household charges are permitted to rise by no more than CPI – 0.3% per annum.

¹¹ Ofcom (2015), Mobile call termination market review 2015-18: Statement of the markets, market power determinations and remedies.

¹² WIC (2014), The Strategic Review of Charges 2015-21: final determination.

This represented a change of approach from the RPI-linked charge increases which the WIC had allowed for during the 2010-15 period.

Summary

Arguably only one of the regulators that has so far moved away from RPI indexation towards CPI indexation has done so in the face of the challenge that comes from the low starting value of an RPI-stripped cost of capital:

- the CAA dealt with that challenge by preserving RPI indexation of the RCV and obviating the need for a P_0 increase; and
- Ofcom has continued to use a nominal cost of capital in most of its price controls. In the one place that it has switched from an RPI- to CPI-stripped rate of return, it can be observed that the regulated service represents a very small fraction of the mobile companies' total revenues. The pace of technological change is also such that the switch from RPI to CPI has been accommodated within a charge control settlement that still provides for CPI – 26% reduction in charges; and
- the WIC in regulating Scottish Water, as a company without conventional shareholders, no longer worries about profits in RCV x WACC terms.

It is also noticeable that NATS is the only one of the affected companies that has a stock of index-linked debt.

This makes the CAA the most relevant of the three case studies from a water industry perspective.

Annex 2: CPI or CPIH

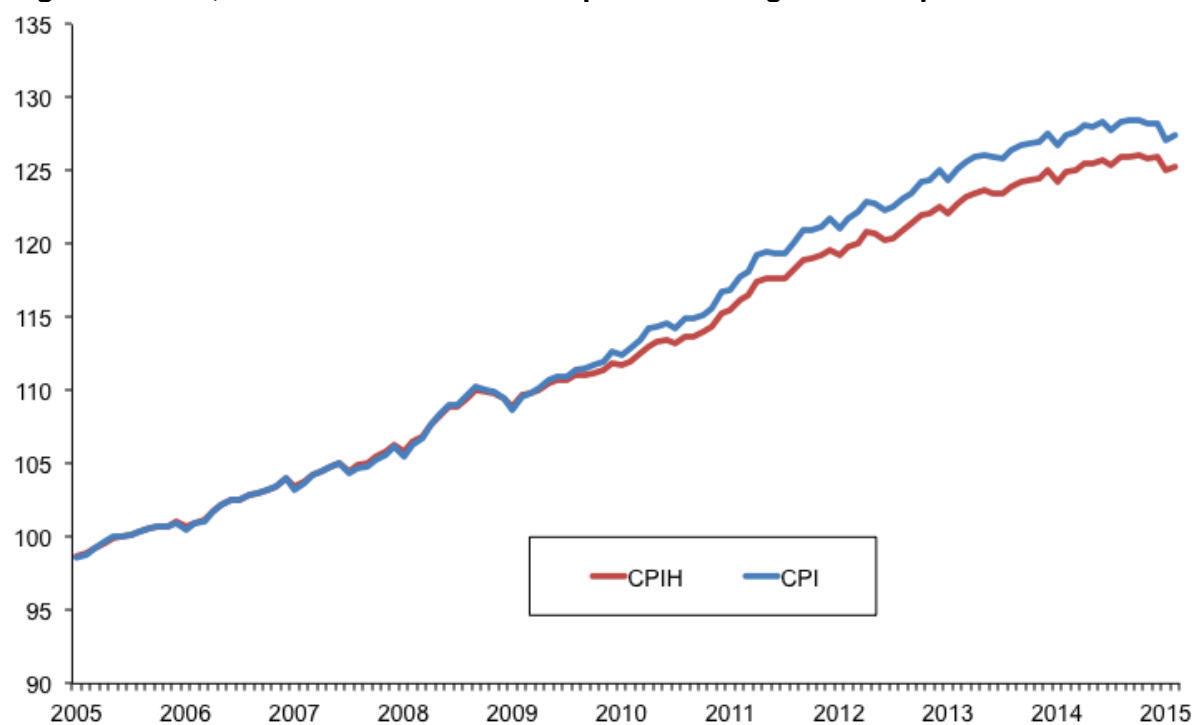
The debate about indexation in the water industry has previously been about whether CPI should one day replace RPI. The report by Paul Johnson for the UK Statistics Authority brought a slightly different perspective in that Mr Johnson suggested that the variant CPIH index is actually the best and most relevant inflation index and should thus be regarded as the natural alternative to RPI.

CPI and CPIH, as the labelling suggests, come from the same family of inflation measures. That is to say that CPIH is constructed in accordance with the same principles and rules as CPI and so does not suffer from the statistical weaknesses that afflict RPI. The only difference between the CPI and CPIH indices is that the CPIH basket includes a component for owner occupiers' housing costs, whereas the main CPI index does not. (The reason for this is that the main CPI index is constructed to adhere to EU harmonisation regulations and Eurostat has until now found it difficult to devise a methodology for measuring owner occupiers' housing costs that can be applied consistently in all EU member states.)

The measure of owner occupiers' housing costs is intended to capture how much a household spends on shelter for itself. The ONS' current approach to calculating this amount is to ask how much a household would have to pay if it rented its property rather than owned it outright – the so-called 'rental equivalence' method. Each month, the ONS will ask the Valuation Office Agency (VOA) for aggregated figures from its nationwide surveys of rents and the month-by-month and year-by-year changes in the value of the VOA's index will feed directly into CPIH.

The data from 2005 to date shows that owner occupiers' housing costs calculated by this method have typically risen more slowly than other prices. This in turn means that the rate of CPIH inflation has been an average 0.2% per annum below the rate of CPI inflation.

Figure A1: CPI, CPIH and the owner occupiers' housing cost component of CPIH



Source: ONS.

Notes: the historical CPIH series was revised in March 2015 to incorporate improvements in the VAO's and ONS' measurement of rents. The effect of these revisions was to increase slightly the gap between CPI and CPIH inflation over the period 2005 to 2015.

This report does not consider the merits of CPI vs CPIH inflation. This is for two main reasons:

- at the time of writing in April 2015, the UK Statistics Authority has not responded formally to Mr Johnson's report. This makes it unclear whether the preference for CPIH over CPI is one that is held more widely among statisticians and policymakers or whether Mr Johnson is a lone voice on this matter; and
- it is also not clear whether the financial effects of moving from RPI to CPIH indexation would be materially different from the effects of moving towards CPI indexation. Although figure A1 shows that CPIH has increased more slowly than CPI in recent years, it is not clear whether this is a function of housing market conditions during the specific 2005-15 period or whether there is evidence of a trend that might be expected to persist over the medium to long term. We have not been able to identify any research that investigates the existence or otherwise of a permanent CPI / CPIH wedge and so we could not say with any certainty that such a wedge exists.

If the UK Statistics Authority indicates a preference for CPIH over CPI when it responds to Mr Johnson's report later this year, and if CPIH starts to replace CPI as the pre-eminent measure of inflation in the UK economy (e.g. if the government's inflation target comes to be defined in terms of CPIH inflation or if pension liabilities link to CPIH), it may be that this report can be rewritten. At the present time, this feels premature and, hence, it is not inappropriate to be couching the choices around indexation as RPI vs CPI.