

# Prior-year adjustment uplifts

Ofgem

9 July 2020



**FINAL REPORT**

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## EXECUTIVE SUMMARY

The RIIO price controls set the allowed revenues of electricity and gas network operators (ENOs) and system operators (SOs) in Great Britain (GB). Sectoral price control determinations – which will soon return to a five-yearly cycle – are the main points when Ofgem sets companies’ allowed revenues, but they are not the only time when it updates companies’ allowed revenues. Ofgem also updates allowed revenues each year using a set of mechanisms defined in companies’ licences. Those “prior-year adjustments” cover values that feed through to allowed revenue with a delay of at least one year.

### Scope

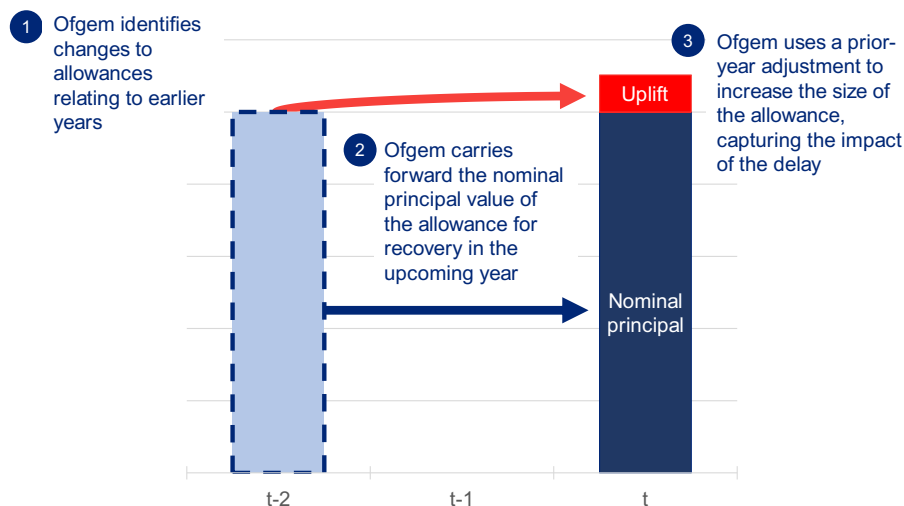
Ofgem has commissioned this paper from CEPA to examine a set of issues related to one aspect of those prior-year adjustments – time value of money uplifts. Those uplifts serve to: (i) compensate companies for having to wait to recover an allowance earned in a previous year; and (ii) recoup the benefit companies gain from having recovered revenue they must now return to customers. They do not relate to any uncertainty about the mechanism itself; the mechanism is low risk, transparently updating allowances and revenue at the earliest opportunity with very limited regulatory discretion.

Ofgem is reviewing the current prior-year adjustments as part of RIIO-2 policy development and has requested support from CEPA to identify if there are grounds for changing them for RIIO-2, and if so, what options it should consider applying.

### Analytical approach

Ofgem implements three main time value of money uplifts in RIIO-1, each of which follows the same basic mechanism, whether applied as part of a positive or negative adjustment. Figure 1 gives a simple illustration of this mechanism in the case of an allowance recovered with a two-year delay.

Figure 1: Illustration of prior-year adjustment mechanism



Source: CEPA

The main uplifts Ofgem currently uses only differ in the rate used for each year of delay: (i) the allowed nominal vanilla weighted average cost of capital (WACC); (ii) the Bank of England (BoE) Base Rate; or (iii) the BoE Bank Rate plus a margin of either 150bp for distribution or 200bp for transmission. The choice of uplift can have a material impact on the size of the resulting allowances, but Ofgem gives little information on the rationale for applying one approach rather than another. The offsetting of positive and negative adjustments may mean the particular uplift Ofgem uses is of little significance for some companies. However, we have found cases during RIIO-1 where the cumulative impact of the uplifts represented multiple percentage points of Base Revenue.

## Time value of money

The time value of money is the central concept for prior-year adjustment uplifts. However, few regulators provide much information on why they make prior-year adjustments in the ways they do. Ofcom was the only regulator we found to have discussed the issue in detail, justifying an approach based on the short-term cost of debt. However, other regulators continue to use different approaches, including uplifts based on the allowed cost of capital. Ofwat is an example of a regulator that adopts the latter approach.

The difference in approaches across regulators may reflect alternative views on how prior-year adjustments should work in the context of the regulatory framework. Some regulators might see it a fundamental anchor point of the regulatory package that the net present value of all revenues and costs should be protected using the allowed cost of capital set at the price control determination, as the relevant discount rate for the price control. In such cases, the allowed cost of capital would be consistent with the overall regulatory approach.

We also considered a different rationale for prior-year adjustment uplifts, where they are designed to capture the time value of money of the context where they apply. This is similar to the case noted above, except where it can be argued that the time value of money differs significantly from the allowed cost of capital. In that context, we considered Ofgem's time prior-year adjustment mechanisms from two main angles:

- **The marginal cost of capital:** what uplift would preserve the net present value of the price control for investors if revenues are switched between periods *during* the control?
- **Opportunity costs and benefits:** what value would investors gain or lose if no uplifts were applied in an over-recovery or under-recovery scenario?

From the perspective of the marginal cost of capital, our analysis suggested that the way Ofgem treats prior-year adjustments may entail a materially different, lower level of risk for companies compared to the main allowed cost of capital. Therefore, it may be possible to maintain the net present value of the price control revenues and costs for the investor even when using a much lower rate, potentially in line with the short-term cost of debt.

When we considered the issue from the perspective of the company's opportunity cost or benefit in under-payment and over-payment scenarios, our analysis also pointed to the short-term cost of debt as the appropriate time value of money and potentially prior-year adjustment rate. Reflecting Ofcom's findings, the short-term cost of debt under a range of scenarios seems to capture the costs and benefits a network company would face in the event of under or over recoveries of revenues. If prior-year adjustments are considered to have a different risk profile to cash flows under the general price control, i.e. low risk with payment independent of the company's ongoing performance, there are reasons again to consider a short-term cost of debt the appropriate adjustment rate.

We identified cases where the short-term cost of debt may not be a perfect fit for the marginal cost of capital or companies' opportunity cost/benefit. However, those cases served more to raise issues to be addressed by the wider regulatory regime, rather than being ones the uplifts themselves would be well placed to address. For example, the short-term cost of debt might work less well in a scenario where covering a large under-recovery with debt would put the company in breach of its existing debt covenants. It may be appropriate for Ofgem to consider options to reduce the risk of such scenarios arising – e.g. by mitigating the scale of under or over recoveries – rather than seeking to mitigate its impacts through prior-year adjustment uplifts.

## Options for RII-2

We consider that simplicity, cost reflectivity and good incentive properties are desirable features for any prior-year adjustment mechanism.

We used those features to assess the RII-1 mechanisms and potential options to improve them for RII-2, finding that aspects of the current prior-year adjustment uplifts were good but that all three of Ofgem's main approaches had issues of varying degrees, given the range of circumstances in which they apply. We investigated how Ofgem might consider changing its approach for RII-2 so that uplifts are simple, cost reflective and have good incentive properties.

As discussed above, one option would be for Ofgem to use the nominal allowed cost of capital in RIIO-2, as some other regulators (e.g. Ofwat) have done. This would be a simple and transparent single prior-year adjustment rate, and for the reasons discussed above, would be consistent with Ofgem using the allowed cost of capital as an anchor point to maintain the net present value of all revenues and costs under its price controls.

However, through our work we also identified some issues with using the allowed cost of capital as the adjustment rate. In certain circumstances it performs relatively poorly on cost-reflectivity grounds – i.e. as a reflection of the company's time value of money for the prior-year adjustments. As a consequence, it might in principle create unintended incentives for network companies; for example, to intentionally under-recover allowed revenues.

Based on our findings on the time value of money for prior-year adjustment uplifts, we developed another option for Ofgem to consider for RIIO-2, based on a new short-term cost of debt measure. The table below summarises the key features of this new option and how Ofgem might transition across the current arrangements for uplifting allowances and/or revenue recovery errors following a delay.

*Table 1: Short-term cost of debt based prior-year adjustment rate for RIIO-2*

Feature	Description
<b>New measure</b>	
Basis for measure	Short-term cost of debt with a credit quality in line with notional cost of debt in main allowed cost of capital, a maturity of one to two years and a floating rate structure
Structure	"Semi-floating" structure with a floating underlying rate plus a fixed margin, applied symmetrically to positive and negative prior-year adjustments
Underlying rate	BoE Base Rate or the Sterling Overnight Index Average (SONIA)
Margin	100-150bp, updated based on the margin of bond yields over SONIA swap rates
<b>Transition arrangements</b>	
Expenditure and revenue	Suitable for direct transition to new measure
Revenue recovery errors	As above, but with penalty rates remaining in place for large errors
Incentives	Suitable both for new and existing incentives, but Ofgem would need to ensure it can mitigate any unwanted changes in existing incentives' strength
RIIO-1 close-out	Retain existing prior-year adjustments

Source: CEPA

## Conclusions

Overall, we would reflect that in some ways the current arrangements have worked well, and it is not surprising that they have persisted as is. However, given that Ofgem is reviewing the current prior-year adjustments as part of RIIO-2 policy development, there is an opportunity to consider if the current uplift rates remain fit for purpose.

We have explored a number of different options within this short technical report, including using the allowed cost of capital for RIIO-2 and a new short-term cost of debt measure as the prior-year adjustment rate. Both may be appropriate depending on the objective and specific circumstances but may also raise various issues if used as a common adjustment rate for all prior-year adjustments.

Given the complexities of the issues, we suggest that the options are consulted on to allow input from a range of different industry stakeholder groups.

## **1. INTRODUCTION**

The RIIO price controls set the allowed revenues of electricity and gas network operators (ENOs) and system operators (SOs) in Great Britain (GB). Sectoral price control determinations – which will soon return to a five-yearly cycle – are the main points when Ofgem sets companies' allowed revenues, but they are not the only time when it updates companies' allowed revenues. Ofgem also updates allowed revenues each year using a set of mechanisms defined in companies' licences. Those "prior-year adjustments" cover values that feed through to allowed revenue with a delay of at least one year.

Ofgem has commissioned this paper from CEPA to examine a set of issues related to one aspect of those prior-year adjustments – time value of money uplifts. Those uplifts serve to: (i) compensate companies for having to wait to recover an allowance earned in a previous year; and (ii) recoup the benefit companies gain from having recovered revenue they must now return to customers. They do not relate to any uncertainty underlying the mechanism itself; the mechanism is low risk, transparently updating allowances revenue at the earliest opportunity with very limited regulatory discretion.

Ofgem is reviewing the current prior-year adjustments as part of RIIO-2 policy development and has requested support from CEPA to identify if there are grounds for changing them for RIIO-2, and if so, what options it should consider applying. This paper sets out our findings in the sections that follow:

- Section 2 sets out the context of the prior-year adjustment uplifts applied in RIIO-1.
- Section 3 presents our analysis of the time value of money, the central concept for the uplifts.
- Section 4 discusses the desirable features of a prior-year adjustment uplift.
- Section 5 presents our assessment of current arrangements against the desirable characteristics.
- Section 6 develops a proposal for a new measure and how Ofgem might apply it.
- Section 7 summarises our findings.

In addition to the body of the report, Appendix A presents additional analysis of some RIIO-1 adjustments, supplementing the quantitative analysis included in Section 2.4.

## 2. RIIO-1 PRIOR-YEAR ADJUSTMENTS

This section sets out the context of the prior-year adjustment uplifts applied in RIIO-1. We focus on four aspects:

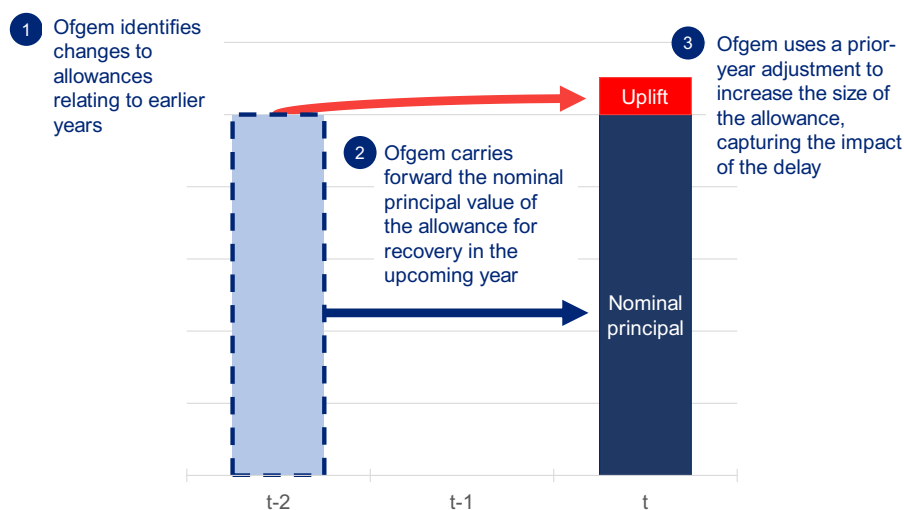
- the range of uplifts that Ofgem applies across the price controls (Section 2.1);
- their relative size (Section 2.2);
- the stated rationale for them (Section 2.3); and
- their relative materiality in the wider price control (Section 2.4).

We find that Ofgem applies three main types of uplift across the RIIO sectors. The choice of specific uplift can have a material impact on the size of the resulting allowances, but Ofgem gives little information on the rationale for applying one approach rather than another. The offsetting of positive and negative adjustments may mean the particular uplift Ofgem uses is of little significance for some companies. However, we have found cases during RIIO-1 where the cumulative impact of the uplifts represented multiple percentage points of Base Revenue.

### 2.1. RIIO-1 PRIOR-YEAR ADJUSTMENT APPROACHES

Ofgem implements three main time value of money uplifts in RIIO-1, each of which follows the same basic mechanism, whether applied as part of a positive or negative adjustment. Figure 2.1 illustrates this mechanism with an allowance recovered with a two-year delay.

Figure 2.1: Illustration of prior-year adjustment mechanism



Source: CEPA

The main uplifts Ofgem currently uses only differ in the rate used for each year of delay:

- the nominal vanilla weighted average cost of capital (WACC)<sup>2</sup>;
- the Bank of England (BoE) Base Rate<sup>3</sup>; or
- the BoE Bank Rate plus a margin of either 150bp for distribution or 200bp for transmission.

<sup>2</sup> This is implemented as a combination of RPI inflation and the real vanilla weighted average cost of capital values from the corresponding year of the price control. The real vanilla weighted average cost of capital is referred to as the “Present Value Factor” or “PVF”.

<sup>3</sup> The BoE Bank Rate is implemented in RIIO-1 licences as the “average specified rate” (ASR).



We more simply refer to these approaches in the rest of this report, respectively, as the “cost of capital approach”, the “Base Rate approach” and the “margin approach”.

There are only a few cases where we identified a different approach being used: Retail Price Index (RPI) inflation is used for the RIIO-ED1 Losses Discretionary Reward; and a pre-tax WACC is used in RIIO-T1 for some allowances related to the TPCR4 and the TPCR4 roll-over period.

## 2.2. IMPACT OF UPLIFT SELECTION

The choice of specific uplift can have a material impact on the size of the resulting allowances. Table 2.1 below illustrates the differences based on the uplifts that Ofgem would have applied to compensate NGGT in 2018/19 for a hypothetical value of £100k due two years earlier. Uplifts are symmetric for positive and negative adjustments.

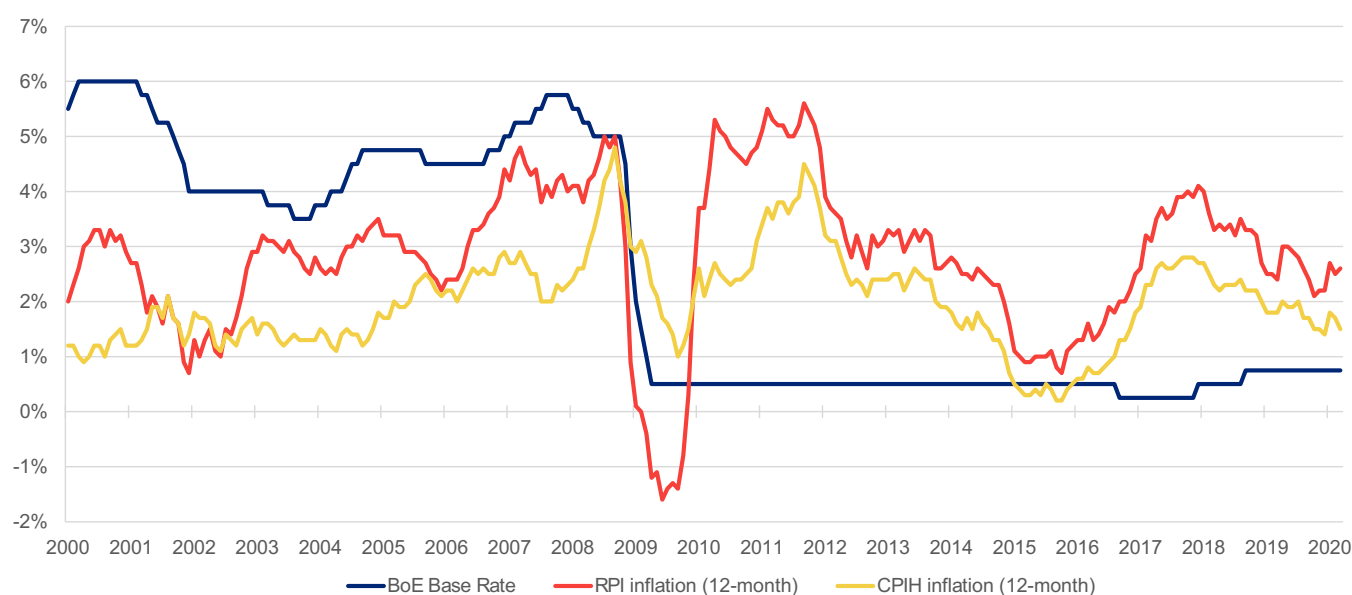
Table 2.1: NGGT prior-year adjustment worked example in RIIO-1

Uplift	2016/17 nominal return	2017/18 nominal return	2018/19 payment
No adjustment	-	-	£100.00k
BoE Base Rate	0.34%	0.35%	£100.69k
Margin approach <sup>4</sup>	1.84%	1.85%	£103.72k
Cost of capital <sup>5</sup>	6.29%	7.83%	£114.62k

Source: CEPA analysis based on NGGT 2018/19 revenue return model

As this worked example shows, the cost of capital provides the largest uplift of the three, resulting in a cumulative uplift multiple times larger than even the BoE Base Rate with a margin. Uplifts based on the BoE Base Rate are small by comparison and in this case do not cover RPI inflation (the general measure of inflation used in the RIIO-1 price controls). The BoE Base Rate is not always below inflation, but that has been the case for most of the last ten years, as shown in Figure 2.2 below.

Figure 2.2: Comparison of the BoE Base Rate, RPI and CPIH inflation (Jan 2000 to Mar 2020)



Source: CEPA analysis based on BoE and ONS data

<sup>4</sup> NGGT has a 150bp margin on top of the ASR in its K-factor adjustments if revenue recovered is within four percent of target.

<sup>5</sup> Please note the values here use actual RPI inflation. Licences use a forecast with a correction the next year for actual inflation.

## 2.3. EXPLANATION OF BASIS FOR RIIO-1 ADJUSTMENTS

Ofgem currently gives little written explanation for why a specific uplift is used, but there is consistency in how it applies them:

- the cost of capital approach applies for allowances linked to expenditure, revenue and incentive payments based on a monetary value, such as a carbon price or the value of lost load;
- the Base Rate approach applies for other incentives, such as customer satisfaction; and
- the margin approach is used for historic revenue collection errors.

The RIIO-1 price control financial handbooks describe the cost of capital approach as capturing the “*time value of money*”. In describing the base revenue adjustments calculated in the Price Control Financial Models (PCFMs), Ofgem states that the role of such an uplift is to keep the licensee “*in the same economic position*” as if the adjustments had been implemented in the relevant year concerned.<sup>6</sup>

We found no explicit rationale for the other RIIO-1 uplifts but we identified a DPCR5 annual report that suggested the margin approach provided an “*interest adjustment for the time value of money*”.<sup>7</sup> Ofgem does not explain why it might have considered the time value of money to be lower for revenue collection errors than where it applies the cost of capital approach.

## 2.4. MATERIALITY OF RIIO-1 UPLIFTS

We analysed the prior-year adjustment uplifts applied to base revenue to understand the materiality of the current approaches. We analysed these adjustments as they were where we would expect to see their most material impact – base revenue covers a large portion of allowed revenue and the adjustments use the cost of capital approach, which produces the largest uplifts of the three main approaches that Ofgem uses.

We analysed the size of the uplifts applied through prior-year adjustments by comparing the incremental changes to base revenue (MOD) during the price control period as calculated in the latest PCFMs and our own calculations that would have applied if there had been no adjustment factor, not even for inflation. This approach isolates the nominal principal value (based on changes in base revenue in the relevant earlier years) from the uplifts Ofgem applied on top.<sup>8</sup> We provide results by company in Figure 2.3.

As shown in Figure 2.3 below, we found that there are many cases where the uplifts are not material in the context of the wider price control. There are, however, cases where they can have a noticeable impact, either in absolute terms or compared to the other allowances of the company.

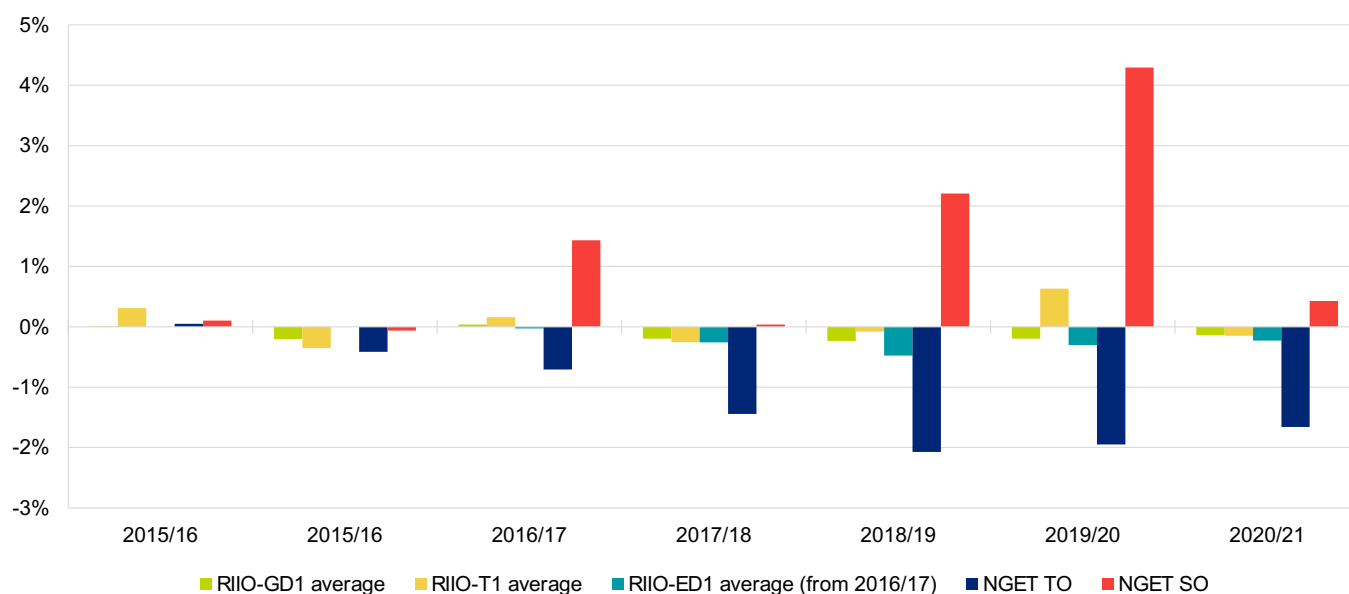
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<sup>6</sup> See for example p12, Ofgem (Aug 2017) “ET1 Price Control Financial Handbook Version 2.0”, available on [ofgem.gov.uk](https://www.ofgem.gov.uk)

<sup>7</sup> p57, Ofgem (Mar 2012) “Electricity Distribution Annual Report for 2010-11”, available on [ofgem.gov.uk](https://www.ofgem.gov.uk)

<sup>8</sup> The published PCFMs show the calculation of “catch-up” adjustments applied to variances in earlier years using the real vanilla WACC. As that calculation is expressed in real terms, we needed an extra step to capture in nominal terms how the PCFM also updates the nominal principal values for RPI inflation.

Figure 2.3: RIIO-1 PCFM prior-year adjustment uplift share of base revenue, by sector and selected licensees



Source: CEPA analysis based on Ofgem PCFMs

The uplifts were not material in many cases, either a result of good revenue forecasts or a portfolio effect of deviations in one direction being offset by deviations in the other. Sometimes, this meant net adjustments moved from being positive in one year to negative in the next. In other cases, adjustments were small but more persistently positive or negative.

For electricity and gas distribution companies, most uplifts fell between plus or minus £2m a year, with only two cases with uplifts greater than £5m. Those two cases were also the only ones where the net uplifts exceeded one percent of a distribution company's base revenue. The Scottish electricity transmission owners (TOs) had adjustments of comparable size to the distribution companies, though SHET's uplifts exceeded one percent of base revenue in two years.

The most material uplifts that we saw were for National Grid, particularly as electricity TO (NGET-TO) and electricity system operator (NGET-SO). For NGET-TO, the uplifts alone exceeded £25m in four years (in all cases negative), and even exceeded two percent of base revenue in one year. NGET-SO's uplifts tended to be much smaller in absolute terms but were high compared to its base revenue. In one year, the uplift exceeded four percent of National Grid ESO's base revenue, the largest across the RIIO-1 sectors.

Overall, in RIIO-1 there has been a tendency for the PCFM prior-year adjustment uplifts to be negative. Table 2.2 below shows the net effect at the sector level.

Table 2.2: RIIO-1 PCFM prior-year adjustment uplifts, aggregate value by sector (nominal £m)

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
T1	3.8	-10.2	-12.2	-28.8	-40.5	-29.9	-23.6
GD1	0.3	-7.3	1.5	-7.3	-8.4	-6.8	-5.3
ED1	n/a	n/a	-1.4	-14.3	-26.7	-16.4	-13.3
<b>Total</b>	<b>4.1</b>	<b>-17.5</b>	<b>-12.1</b>	<b>-50.4</b>	<b>-75.6</b>	<b>-53.1</b>	<b>-42.3</b>

Source: CEPA analysis of PCFM models

Table 2.2 shows that, all else equal, most GB consumers benefited in RIIO-1 from Ofgem calculating MOD using the approach that produced the largest uplifts: the cost of capital. However, this finding should be treated with caution—the analysis reflects just one class of prior-year adjustment, it is not clear the same pattern of adjustments will appear again and we understand Ofgem is proposing some changes to its “annual iteration process” for RIIO-2.

## **2.5. SUMMARY**

In this section, we set out that Ofgem applies three main types of prior-year adjustment uplifts across the RIIO sectors. The choice of uplift can have a material impact on the size of the resulting allowances, but Ofgem gives little information on the rationale for applying one approach rather than another. The offsetting of positive and negative adjustments may mean the particular uplift Ofgem uses is of little significance for some companies. However, we have found cases during RIIO-1 where the cumulative impact of the uplifts represented multiple percentage points of Base Revenue.

### 3. THE TIME VALUE OF MONEY

This section presents our analysis of the time value of money, the central concept cited by Ofgem as the basis for prior-year adjustment uplifts in RIIO-1. We followed a two-step approach to develop our position on its nature for uplifts in RIIO-2:

- a targeted review of regulatory precedent (Section 3.1); and
- an analysis of the underlying financial economics (Section 3.2).

Our survey of precedent found that regulators use multiple methods for setting prior-year adjustment uplifts, though little material was readily accessible to explain their choices. Two cases from Ofcom provided the most detailed discussion, justifying uplifts based on a short-term cost of debt.

There is a line of thinking that within the context of regulated utilities such as energy networks, using the allowed cost of capital as the prior-year adjustment rate allows the regulator to anchor the net present value of all revenues and costs under the price control to its core discount rate, the allowed cost of capital.

However, we also analysed the financial economics of the adjustments in greater detail from the perspective of investors' time value of money. Through that analysis, we found that the low-risk nature of the prior-adjustment mechanism means the time value of money for prior-year adjustments is likely to be lower than the main allowed cost of capital in the price control; similar to Ofcom, we expect it to be more in line with the short-term cost of debt.

#### 3.1. REGULATORY PRECEDENT

Ofgem is not the only regulator to use prior-year adjustments in their price controls. They are a common feature of revenue recovery corrections. However, there is little consensus on which type of uplift should apply. Table 3.1 below shows this with a sample of cases from the UK and internationally.

*Table 3.1: Sample of prior-year adjustment uplift methods used by other regulators*

Regulator and case	Characterisation of approach
<b>Ofcom, UK</b> Gamma and Ethernet disputes	BoE Base Rate +1% unless otherwise justified (see detailed discussion below)
<b>Ofwat, England &amp; Wales</b> In-period revenue reconciliation	Allowed cost of capital as set at final determination <sup>9</sup>
<b>CAA, UK</b> Heathrow iH7 passenger yield correction	Three-month Treasury Bill discount rate +3% in the case of over-recovery, +0% for under-recovery <sup>10</sup>
<b>CRU, Ireland</b> Gas Transmission revenue correction	Euribor +2%, except in case of large over-recoveries, where +4% applies <sup>11</sup>
<b>AEMC, Australia</b> Electricity distribution revenue correction	Allowed rate of return, as per determination for the period <sup>12</sup>

Source: CEPA analysis of regulatory decisions

<sup>9</sup> p33, Ofwat (Dec 2017) "Delivering Water 2020: Our methodology for the 2019 price review Appendix 7: Network plus water and wastewater controls", available on [ofwat.gov.uk](https://www.ofwat.gov.uk)

<sup>10</sup> p16, CAA (Dec 2019) "Heathrow Airport Limited Licence granted under the Civil Aviation Act 2012", available on [caa.co.uk](https://www.caa.co.uk)

<sup>11</sup> p15, CRU (Sep 2019) "Gas Transmission Tariffs Article 30 Tariff Network Code Information 2019/20", available on [cru.ie](https://www.cru.ie)

<sup>12</sup> Clause 6.18.7(c)(3) National Electricity Rules Version 142, Chapter 6 "Economic Regulation of Distribution Services", available on [aemc.gov.au](https://www.aemc.gov.au)

As shown in Table 3.1, some regulators use the cost of capital; others use an interest rate benchmark, plus a margin. In some cases, the margin on the benchmark increases or decreases to encourage accurate forecasting.

Like Ofgem, most regulators provide limited information on the rationale for the uplifts they use. Many mechanisms may have been in place since the start of regulation, perhaps because they have worked well or simply because there have been higher priority issues to fix elsewhere.

There is one regulator, however, that has published detailed thinking on its prior-year adjustment uplift policy: Ofcom. It issued two determinations as part of dispute processes in the last decade, setting out the basis for its position based on a short-term cost of debt. We summarise those determinations below.

## Gamma dispute

In 2013, Gamma Telecoms Holdings Limited (Gamma) raised a dispute with BT regarding the interest rate set out in BT's Standard Interconnection Agreement in the case of charges being adjusted or recalculated with retrospective effect. Gamma contested that the "OfTel Interest Rate" used for this purpose (set at 0.375 percent above three-month LIBOR) was not fit for purpose in the context of such payments where Ofcom makes a determination. It contested that the rate undervalued the benefit to BT from holding the additional sums recovered and that it did not ensure that *"parties are returned to a neutral position on repayment."*<sup>13</sup>

In reaching its determination on this matter, Ofcom found that the BoE Base Rate plus one percent was likely to be an appropriate proxy for the risk-free rate plus a spread for BT's debt, and that it was likely to be appropriate for interest on repayments arising from disputes related to the interconnection agreement. It stated in the determination that in the absence of evidence to the contrary, it considered in the majority of cases, the appropriate interest rate should *"reflect the time value of the principal to the overcharging firm (i.e. the benefit that the overcharging firm enjoys by virtue of the delay between its overcharging and the date on which it makes repayment)"*.<sup>14</sup>

Ofcom also set out that it considered it *"reasonable to expect that the opportunity cost to the overcharging firm reflects the cost of debt as it could repay outstanding debt or avoid taking out debt with an additional increase in cash as a result of an overcharge."*<sup>15</sup> That is, it found the time value of money to be closer to the cost of debt than the full cost of capital.

## Ethernet dispute

In May 2017, Ofcom reached a similar determination in relation to a separate dispute regarding claims for interest payments on overcharging by BT for Ethernet services.<sup>16</sup> That determination followed a Competition Appeals Tribunal ruling that BT should pay interest on such sums and ordered Ofcom to determine the appropriate rate.<sup>17</sup>

Based on its earlier judgement, Ofcom asked if the BoE Base Rate plus one percent was the correct starting point. It found that it did not represent BT's cost of debt well during the period of the over-recovery, assuming a four-year maturity and BBB rating. However, Ofcom found it represented a reasonable basis for estimating the interest on the interest from 2012 onwards, assuming a maturity of one to two-and-a-half years. As a result, Ofcom adopted the BoE Base Rate plus one percent as the rate of interest on unpaid interest.

Ofcom rejected the disputing parties' arguments that overcharging effectively reduced BT's net financing requirement, which might call for compensation at the full allowed cost of capital. Instead it saw overcharging as an

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<sup>13</sup> p3, Ofcom (Oct 2013) *"Dispute between Gamma and BT relating to the "OfTel Interest Rate" contained within BT's Standard Interconnect Agreement ("SIA")*", available on [ofcom.org.uk](http://ofcom.org.uk)

<sup>14</sup> p52, Ofcom (Oct 2013)

<sup>15</sup> p33, Ofcom (Oct 2013)

<sup>16</sup> Ofcom (May 2017) *"Final determinations concerning redetermination of disputes relating to BT's charges for Ethernet services (remitted by the CAT)"*, available on [ofcom.org.uk](http://ofcom.org.uk)

<sup>17</sup> See CAT (May 2017) *"BT & Ors v OFCOM & Ors [2017] EWCA Civ 330"*, available on [catribunal.org.uk](http://catribunal.org.uk)

additional source of financing.<sup>18</sup> That is, the nominal principal overpayment does not necessarily change the overall quantum of finance required, but it may affect its composition and cost.

In considering the nature of this additional source of financing, Ofcom set out that it did not consider overpayments to be like equity. It set out that the overpayment did not create “*an additional shareholder who is bearing any equity risk.*” All equity risk remained with BT’s shareholders as it needed to repay the nominal principal independent of its broader financial performance—those being overcharged did not take on any equity risk of BT. That position supported Ofcom’s view that the time value of money was not the cost of capital.

Ofcom was of the view that where there was an overcharge, the benefit to BT’s shareholders was the interest rate that would have otherwise been paid on debt. Regarding the indirect effect of the new financing source on gearing, it did not consider the overcharge provided BT any opportunity to adjust equity returns that it would not have otherwise had by making adjustments to its gearing.

Ofcom did note that it could be relevant to consider a cash deposit rate in certain circumstances, but it did not find it relevant in the Ethernet dispute:

*“We considered that the cash deposit rate would only be appropriate where BT expected to have to repay the overcharge within a short period of time such that it would not be practicable to repay debt or where it had no opportunity to repay debt or avoid taking out additional debt (this might be the case, for example, if it had little debt in issue). We did not consider that these factors applied to this case.”*

In effect, Ofcom found the time value of money for over-payments to be linked to the greatest benefit it was reasonable to have access to while holding over-recovered funds.

### **3.2. FINANCIAL ECONOMICS**

At the point of making price control determinations, regulators routinely profile companies’ revenues across years. The regulatory asset value (RAV) is the primary vehicle for that process, spreading the remuneration of expenditure over many years. Investors are content to wait if the regulator compensates them for their cost of capital—the net present value of future revenues (discounted at their cost of capital) matches the upfront expenditure they finance, adjusted for the risks they face. The allowed cost of capital is the regulator’s view of the investors’ discount rate for the price control.

Maintaining the net present value of revenues is also relevant when dealing with timing mismatches that emerge within the price control, notably prior-year adjustments. Mixed regulatory precedent shows, however, that regulators are less consistent in how they do this type of profiling.

The difference in approaches across regulators may reflect alternative views on how prior-year adjustments should work in the context of the regulatory framework. Some regulators might see it a fundamental anchor point of the regulatory package that the net present value of all revenues and costs should be protected using the allowed cost of capital set at the price control determination, as the relevant discount rate for the price control. In such cases, the allowed cost of capital would be consistent with the overall regulatory approach.

Indeed, for a number of prior-year adjustments that link directly to the building blocks of the price control, e.g. total expenditure (totex) variations, Ofgem’s current approach of using the allowed cost of capital as the prior-year adjustment rate may be consistent with this objective. The principle as stated in the RIIO financial handbook is to keep the licensee “*in the same economic position*” as if the adjustments had been implemented in the relevant year concerned, which if interpreted in the context of the overall price control and its assumed discount rate, would mean using the allowed cost of capital.

We have also considered cases where prior-year adjustment uplifts might be designed to capture the time value of money of the context where they apply. This is similar to the case noted above, except where it can be argued that

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<sup>18</sup> Note it actually calls this funding



the time value of money differs significantly from the main allowed cost of capital. In that context, we considered Ofgem's time prior-year adjustment mechanisms from two main angles:

- **The marginal cost of capital:** what uplift would preserve the net present value of the price control for investors if revenues are switched between periods *during* the control?
- **Opportunity costs and benefits:** what value would investors gain or lose if no uplifts were applied in an over-recovery or under-recovery scenario?

In the former case, our analysis suggested that the way Ofgem treats prior-year adjustments may entail a materially different, lower level of risk for companies compared to the main allowed cost of capital. Therefore, it may be possible to maintain the net present value of the price control revenues and costs even when using a much lower rate, potentially in line with the short-term cost of debt.

### 3.2.1. Short-term debt as the marginal cost of capital

Looking closer at prior-year adjustments, we find that the marginal cost of capital for prior-year adjustments may be like a short-term cost of debt: (i) the main allowed cost of capital need not be the only cost of capital from the perspective of investors; (ii) there is a material difference between the risk profiles of prior-year adjustments and the wider regime; and (iii) the nature of prior-year adjustments has much in common with short-term debt.

#### Multiple costs of capital

An investor owning the whole regulated business might see their time value of money as the allowed cost of capital. They could use that same rate to value all investments and cashflow mismatches in the business. However, it would be possible for them to take a more granular approach, for example, capturing how an individual project matures over time or considering the risks related to different business units:

- **Project maturity:** Considering a standalone project, it would not be controversial for an investor to use more than one discount rate. They could use a higher "interest during construction" rate before the project is complete, before transitioning to a lower operational cost of capital. As the project matures, the cost of capital changes and the investor makes a capital gain (loss) when it falls (rises).
- **Business units:** Similarly, it would not be controversial for an investor to seek to decompose the cost of capital for different business units within a corporate group. Separable activities with distinct activities may have distinct risk profiles and so have their own cost of capital.

The cost of capital can be difficult to identify with precision so it could be reasonable for an investor to use one rate for similar activities. However, applying that single rate to activities that are much higher or lower risk could result in the investor making poor decisions based on assessments that either under-value or over-value the opportunity at hand.

#### Differences in risk profile

The main price control allowed cost of capital compensates investors for the risk of their licensed activities. This includes a range of commercial, technical and regulatory risks. However, prior-year adjustments are arguably different, and so may justify their own cost of capital.

By the time Ofgem comes to calculate prior-year adjustments, much of the risk in the company has already crystallised. Once calculated, the payment of a prior-year adjustment is effectively independent of the company's ongoing performance—that risk is in the past.

#### Comparison with the short-term cost of debt

We find that the risk profile of prior-year adjustments is like a company's short-term debt, with few differences of substance. Indeed, differences may be more likely to arise if prior-year adjustment uplifts are not set at a level that captures the company's short-term cost of debt.



## Similarities

Prior-year adjustments have much in common with a short-term debt security:

- the duration of risk exposure is finite;
- creditors have high confidence on the promise of repayment in full;
- any counterparty risk is minimal; and
- terms are known in advance and independent of the wider profitability of the business.

The wider cashflows of the business would not meet all these conditions, and so it is possible that lenders could see these cashflows as being even higher quality than those they lend against already. Companies might need special ring-fencing of these cashflows to secure a cost of debt lower than their wider credit rating, but we think it would be hard to say that the cost of debt for prior-year adjustments should be any more costly than the short-term cost of debt the company can already secure.

## Differences

Prior-year adjustments have some differences with debt, but only really in terms of their implementation. For example, Ofgem sets terms administratively in a licence—they are not negotiated commercially. Such differences do not detract from the overall view that the marginal cost of capital from an investor's perspective is like a short-term cost of debt.

There are, however, two further differences that reflect how prior-year adjustments sit within the wider context of the business:

- **Breach of covenants:** A company's existing lenders may impose limits on a company's financing arrangements, that if exceeded, allow them to demand early repayment in full. If a prior-year adjustment (most likely a large negative one) affects if a company is in such a position or not, that may have a greater impact on the company's cost of capital than only the short-term cost of debt. This impact may be difficult to manage directly through prior-year adjustment mechanisms alone, so Ofgem may wish to consider it as part of the wider regulatory framework.
- **Basis risk:** If Ofgem sets prior-year adjustment uplifts at a level above (below) the short-term cost of debt, shareholders bear some risk of a loss (profit) from over-recovery and a profit (loss) from under-recovery. That effect may not change the marginal cost of capital for an individual payment but could leave some residual basis risk with the investors owning the business. If the marginal cost of capital for prior-year adjustments is in line with the short-term cost of debt, then aligning uplifts with that helps to de-risk them, reducing the cost of capital for the whole business.

## Summary

Overall, while there are differences with a short-term loan, we find good reasons to believe that in many circumstances a company could de-risk its prior-year adjustment exposure substantially, simply by using a short-term loan. The visibility and certainty with which payments are made suggests that the cost of that debt may be no higher than that which it already has access to over a short maturity, particularly when the company is not near the limits of its debt capacity.

### 3.2.2. Short-term debt as the opportunity cost

There is a close link between the marginal cost of capital and an investor's opportunity cost. Therefore, we tested the findings from the preceding section by considering two scenarios:

- the benefit to a company from a short-term over-recovery; and
- the cost to a company from a short-term under-recovery.

To capture the full impact of the scenario, we assumed no prior-year adjustment uplift applied. In each case, we found the opportunity cost or benefit to be in line with a short-term cost of debt.

### Over-recovery scenario

If a company over-recovers its allowances, there are several things it can do. The simplest is to place the funds in a bank account and earn a small amount of interest. However, there may be more valuable ways to use them.

One alternative use of the funds would be to increase dividends now and reduce them later when repayment is due. This may appear attractive as the cost of equity will be higher than the interest it could earn on deposits. However, it is not clear that the benefit to shareholders is as high as the cost of equity. The benefit may be more like a short-term cost of debt:

- **The equity risk of the business is unchanged:** The temporary availability of the funds does not change the fundamental riskiness of the business—the underlying factors that made the future dividend risky remain.
- **By bringing forward dividends, shareholders are effectively giving themselves a loan:** Taking higher dividends now at the certain price of lower dividends later, the shareholders would do nothing more than what they could do with a loan in the absence of the additional sums.
- **The benefit of that loan is equivalent to the cost of the business taking out a short-term loan:** Shareholders might not put an explicit interest rate on bringing forward the dividends, but it could be approximated by considering the interest cost that would apply if the business were to achieve the same effect using commercially available debt, rather than over-recovered funds.

It is possible that shareholders could consider taking a higher dividend now to invest in (or increase their stake in) some other outside opportunity that offers remuneration at a higher rate of return. However, opportunities offering a higher rate of return must entail some higher risk than short-term debt. This means the investor risks being worse off when payment is due, particularly if they need to dispose of the investment after such a brief time period. They might be better off, but only because they chose to take a risk. Arguably the only real benefit offered by the temporarily available funds is the short-term cost of debt.

An over-recovery scenario was also considered in the Ofcom precedent discussed in Section 3.1 above. In the event of an over-recovery, Ofcom found that the company had access to an alternative (but temporary) source of finance. Over the timescales it considered in that case, the benefit to shareholders was the interest rate they would otherwise have paid on debt sourced to finance the company's activities.

### Under-recovery scenario

In an under-recovery scenario, there are a number of things a company can do to ensure it can still finance its activities. One option could be to reduce dividends now and increase them later. Alternatively it could achieve a similar effect by taking out a short-term loan, potentially drawing on existing general-purpose facilities. The effect of those two options is similar as there is no change in the underlying business risk—shareholders still face the same performance risks as they would without the under-recovery.

If the company reduced dividends now with the promise of increasing them later, shareholders themselves might look to borrow to smooth out their income. Alternatively, the company could use a short-term loan to maintain dividends at the same level as before. In both cases, the opportunity cost is the relevant cost of debt.

It could be possible to consider that the under-recovery means shareholders forgo some outside investment where they could earn an alternative rate of return. However, if that opportunity truly appears attractive, the real cost to shareholders is no more than the cost of borrowing to access the necessary funds. It is not clear why the under-recovery would mean forgoing the opportunity altogether.

### 3.3. SUMMARY

The time value of money is the central concept for prior-year adjustment uplifts. However, few regulators provide much information on why they make prior-year adjustments in the ways they do. Ofcom was the only regulator we found to have discussed the issue in detail, justifying an approach based on the short-term cost of debt. However, other regulators continue to use different approaches, including uplifts based on the allowed cost of capital. Ofwat is an example of a regulator that adopts the latter approach.

The difference in approaches across regulators may reflect alternative views on how prior-year adjustments should work in the context of the regulatory framework. Some regulators might see it a fundamental anchor point of the regulatory package that the net present value of all revenues and costs should be protected using the allowed cost of capital set at the price control determination, as the relevant discount rate for the price control. In such cases, the allowed cost of capital would be consistent with the overall regulatory approach.

We also considered a different rationale for prior-year adjustment uplifts, where they are designed to capture the time value of money of the context where they apply. This is similar to the case noted above, except where it can be argued that the time value of money differs significantly from the allowed cost of capital. In that context, we considered Ofgem's time prior-year adjustment mechanisms from two main angles:

- **The marginal cost of capital:** what uplift would preserve the net present value of the price control for investors if revenues are switched between periods *during* the control?
- **Opportunity costs and benefits:** what value would investors gain or lose if no uplifts were applied in an over-recovery or under-recovery scenario?

From the perspective of the marginal cost of capital, our analysis suggested that the way Ofgem treats prior-year adjustments may entail a materially different, lower level of risk for companies compared to the main allowed cost of capital. Therefore, it may be possible to maintain the net present value of the price control revenues and costs for the investor even when using a much lower rate, potentially in line with the short-term cost of debt.

When we considered the issue from the perspective of the company's opportunity cost or benefit in under-payment and over-payment scenarios, our analysis also pointed to the short-term cost of debt as the appropriate time value of money and potentially prior-year adjustment rate. Reflecting Ofcom's findings, the short-term cost of debt under a range of scenarios seems to capture the costs and benefits a network company would face in the event of under or over recoveries of revenues. If prior-year adjustments are considered to have a different risk profile to cash flows under the general price control, i.e. low risk with payment independent of the company's ongoing performance, there are reasons again to consider a short-term cost of debt the appropriate adjustment rate.

We identified cases where the short-term cost of debt may not be a perfect fit for the marginal cost of capital or companies' opportunity cost/benefit. However, those cases served more to raise issues to be addressed by the wider regulatory regime, rather than being ones the uplifts themselves would be well placed to address. For example, the short-term cost of debt might work less well in a scenario where covering a large under-recovery with debt would put the company in breach of its existing debt covenants. It may be appropriate for Ofgem to consider options to reduce the risk of such scenarios arising – e.g. by mitigating the scale of under or over recoveries.

## 4. DESIRABLE FEATURES

An understanding of the nature of the time value of money lays the foundations for the assessment of prior-year adjustment uplifts, but it is most useful when combined with a vision of the desirable features of such a mechanism. This section discusses three such features: simplicity (Section 5.1); cost reflectivity (Section 5.2); and good incentive properties (Section 5.3).

We used these three features to assess the current prior-year adjustment uplifts and to inform the development of potential options to improve them for RIIO-2.

### 4.1. SIMPLICITY

Regulators often cite simplicity as one of the objectives they consider when formulating new policies. Indeed, it can be seen in Ofgem's statutory duty to have regard to *"the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed."*<sup>19</sup>

The benefits of simplicity should not be overlooked, recognising the benefit for consumers from regulatory mechanisms that are simple to understand, predict and implement:

- If a mechanism is **simple to understand**, companies can see how it affects them and investors can assess the associated risks. This greater understanding helps companies act in line with the regulator's intention and support investor interest in the sector. A mechanism that is simple to understand need not be crude; simplicity of understanding can be built on transparency and a proportionate degree of complexity, accessible to relevant stakeholders.
- If a mechanism is also **simple to predict**, the benefits of simple understanding are even greater. A mechanism that is simple to predict is likely to be easy to calculate, have clear governance around how it is amended, and will be easy to identify if it is failing to meet its objectives, requiring reform.
- If a mechanism is **simple to implement**, the time and resources dedicated to it by the regulator and companies will be lower, achieving savings for the consumers that bear that burden. A mechanism that is simple to implement may recycle existing mechanisms and values used elsewhere in the regime, and rely on inputs that are easy to access and process.

### 4.2. COST REFLECTIVITY

Cost reflectivity is important for the efficiency of regulatory mechanisms like prior-year adjustment. The key economic concept for the cost reflectivity of prior-year adjustments is the time value of money, as discussed in Section 3.

For prior-year adjustment uplifts, the time value of money is, by definition, the most cost reflective rate to use. As shown in Table 4.1 below, using an uplift different to the time value of money creates opportunities for companies to make a profit (to the detriment of consumers) or a loss (to the detriment of their own financeability).

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<sup>19</sup> The Gas Act 1986 as amended by the Utilities Act 2000 and the Energy Act 2004 *"The principal objective and general duties of the Secretary of State and the Authority"*, available on [ofgem.gov.uk](http://ofgem.gov.uk)

Table 4.1: Impact of prior-year adjustment uplift size in scenarios of historic under-payment or over-payment

Adjustment strength	Historic under-payment	Historic over-payment
> time value of money	<b>Profit:</b> over-remunerate cost of waiting	<b>Loss:</b> benefit of funds more than offset
< time value of money	<b>Loss:</b> under-remunerate cost of waiting	<b>Profit:</b> some benefit of funds is kept

Source: CEPA analysis

We note that our consideration of cost reflectivity in this report is limited to the marginal costs arising directly from prior-year adjustments. We have not considered any knock-on impacts on measures to support companies' financeability or allowed cost of capital across the regulatory settlement. However, we would expect that such impacts would be minimised where the adjustments are cost reflective.

### 4.3. GOOD INCENTIVE PROPERTIES

Good incentives should align companies' interests with those of consumers; they should not create opportunities for companies to profit at consumers' expense. It is possible, however, that situations may arise where companies have discretion to take an action that affects the prior-year adjustment uplifts they receive. Such actions might include the following: (i) delaying the reporting of outturn performance; (ii) producing inaccurate forecasts ahead of the price control (or within it); or (iii) re-phasing expenditure between years.

For prior-year adjustment uplifts there is a strong link between the cost reflectivity of the mechanism and its ability to give good incentives. If the mechanism is cost reflective, the company should be indifferent about taking the actions set out above. However, if uplifts are not cost-reflective, the opportunities for a company to make a profit or loss shown in Table 4.1 may start to emerge. Box 1 below illustrates one such scenario.

#### Box 1: Worked example of a bad incentive

Consider the following scenario:

- A regulator remunerates prior-year adjustments at a higher rate than companies' actual time value of money, five percent a year rather than one percent.
- One company is aware of a large uncontrollable cost (£10m) that the regulator will treat as a pass-through in the year after it is reported, but the regulator is unaware.
- The company has discretion over if it includes the upcoming cost in its forecasts or not and there is no reputational risk from failing to forecast such expenditure as it is considered outside its control.

In this situation, the company has an incentive to omit the expected pass-through from its forecasts:

- If the company accurately forecast the cost, no profit is made; it would receive an allowance of £10m in the same year as the expenditure, completely covering the cost. Revenue equals costs.
- If the company chose to not forecast the cost and instead reported the cost in year after it is incurred, a profit is made. Under the regulator's policies the company is eligible for an allowance of £11.03m ( $£10m \times (1 + 5\%) \times (1 + 5\%)$ ) but it would have been happy to accept £10.20m ( $£10m \times (1 + 1\%) \times (1 + 1\%)$ ) – it earns a profit of £0.82m from the nominal principal adjustment of £10m.

In this case there is an incentive for the company to take the wrong choice from the regulator's perspective, intentionally setting a bad forecast so it can profit on the prior-year adjustment uplift at consumers' expense.

This example is highly stylised and may not resemble real opportunities available to companies in practice. However, it does highlight how an inaccurate estimate of the time value of money can start to weaken companies' incentives to do the right thing, particularly where: (i) the incentive is strong; (ii) the company has discretion to act on it; and (iii) the cost of doing so is small.

### 4.4. SUMMARY

Simplicity, cost reflectivity and good incentive properties are desirable features for any prior-year adjustment mechanism. We use these features to assess the RIIO-1 mechanism and options to improve them for RIIO-2.

## 5. ASSESSMENT OF CURRENT ARRANGEMENTS

We consider that simplicity, cost reflectivity and good incentive properties are desirable features for any prior-year adjustment mechanism. We used those features to assess the RIIO-1 mechanisms and potential options to improve them for RIIO-2, finding that aspects of the current prior-year adjustment uplifts were good but that all three of Ofgem's main approaches had issues of varying degrees.

### 5.1. SIMPLICITY ASSESSMENT

The current regime has mixed performance on simplicity, performing well on points of detail but less well on the overarching approach. Some issues may be dealt with through greater explanation or surrounding governance of the adjustments, but others are more deeply rooted, reflecting a set of arrangements that has evolved piecemeal over time rather than one coherent vision.

- **Many details of the mechanisms may be clear to stakeholders but some areas will not be transparent, particularly the overarching approach.** The basic mechanism of the adjustments is clear and values such as the allowed cost of capital and the BoE Base Rate are well understood by relevant stakeholders. However, there are gaps in the information available to support their understanding, such as the basis for how margins are set for revenue collection corrections. Above the level of detail, however, it will be difficult for stakeholders to piece together and understand the overarching approach and rationale why one type of uplift is applied rather than another.
- **Ability to predict size of uplifts is good but it is not clear what may trigger a review.** The use of the BoE Base Rate and the allowed cost of capital make the current uplifts relatively easy to predict, or at least to understand how they might change. Over a longer time period, however, the lack of clarity on the overall approach may make it difficult for stakeholders to understand how Ofgem might seek to review or change the approach in the future.
- **The current approach is simple to implement even if the basis for having multiple mechanisms is unclear.** The current uplifts do not require particularly detailed calculations or information to compute, recycling the allowed cost of capital as well as easily accessible information on the BoE Base Rate and inflation. The implementation could be simpler, however, if fewer approaches were used.

### 5.2. COST REFLECTIVITY ASSESSMENT

As we set out in Section 3, no prior-year adjustment seeking to capture the time value of money will be perfect, with its value varying from case to case. However, our finding that the time value of money for prior-year adjustments in RIIO-2 may be reasonably captured by the short-term cost of debt suggests the margin approach is likely to be the most cost reflective approach that Ofgem currently implements.

- **The Base Rate approach is likely to fall below the time value of money.** The BoE Base Rate is closer to a simple bank deposit rate than a measure of the cost of debt, as such it is likely to only cover the time value of money over very short periods of time, where timing mismatches are managed through cash balances. It is likely to under-compensate the cost of waiting for funds for over one year and allow companies to keep the benefit of holding funds they later need to return to consumers.
- **Based on the findings in Section 3.2, the BoE Base Rate applied with a margin may be closest to the time value of money for RIIO-2 prior-year adjustments, at least in terms of its approach.** It is not clearly stated but this approach does broadly capture a measure of the short-term cost of debt. The lack of explanation for how the margin is set makes this difficult to confirm, but we would broadly see that as being its purpose. Closer analysis is needed to determine how realistic the level of the margin is and therefore overall, how accurate the uplift is in capturing the cost of debt. Our analysis set out later in this report



indicates the current margins may be at the high-end of what we would expect to see for a short-term cost of debt, at least in normal market conditions.

- **The cost of capital may exceed the time value of money for prior-year adjustments.** The cost of capital captures the time value of money for investment remunerated through the RAV – a long-lived asset intensive proposition. Prior-year adjustments, however, are different in nature, enable remuneration of the companies over a much shorter time horizon. As we explain in Section 3.2, we find reasons to believe that in normal conditions, the time value of money would be closer in line with the short-term cost of debt, a rate materially below the allowed cost of capital.

### 5.3. GOOD INCENTIVE PROPERTY ASSESSMENT

Good incentive properties are linked to cost-reflectivity, but they are also linked to opportunity—a distortion only becomes a bad incentive when a company can act to exploit it. This is relevant to consider for RIIO-2 as we understand Ofgem intends to give companies more discretion to forecast allowances that will be trued-up later. This may help to reduce the size of prior-year adjustments, but it may also give companies greater scope to take advantage of any weaknesses in its design, including in areas where their ability to influence payments has been limited to date. We make the following observations:

- **The Base Rate approach underestimates the time value of money, which could create some poor incentives from the start of RIIO-2.**

Ofgem currently only applies the Base Rate approach to output incentive payments. In RIIO-1, incentive payments were assumed to be zero until calculated, but we understand that Ofgem intends to change those arrangements for RIIO-2. It will allow companies to forecast payments ahead of time, with errors being treated later as prior-year adjustments.

If Ofgem were to continue to apply the Base Rate alone and companies' time value of money is more in line with a short-term cost of debt, that could open new opportunities for companies to profit at the expense of consumers. Artificially over-forecasting incentive payments would be profitable as the prior-year adjustment uplift would only claw back part of their time value of money benefit.

- **The reasonable degree of cost reflectivity of the margin approach weakens the scope for bad incentives.**

The margin approach may not perfectly capture the time value of money in all circumstances,<sup>20</sup> but by approximating a short-term cost of debt it may reduce the scope for opportunities to act simply to profit from prior-year adjustment uplifts. Bad incentives are also limited as it is only used for revenue recovery, an area where penalty rates apply if receipts are outside a given range.

- **The cost of capital approach may have the greatest potential to create opportunities for poor incentives, but we have no evidence of them occurring in practice.**

As explained in Section 3.2, we expect the time value of money of prior-year adjustments to be below the allowed cost of capital. Applying a prior-year adjustment margin higher than the time value of money, could create incentives for companies to increase the likelihood of under-recovery scenarios—over-recovery is penalised beyond the benefit companies might gain, while under-recovery is remunerated above the cost of borrowing over a short period.

We are not aware of particular cases of this leading to a tangible bad incentive, but the cost of capital approach is applied across the widest range of types of prior-year adjustment, and may include some cases where companies can act in a way that increases their likelihood of being in an under-recovery situation. In

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<sup>20</sup> See discussion in Section 3.

some cases, however, this may be difficult to observe as it may be offset by strong incentives in the other direction. For example, in RIIO-1 it is relevant to consider how incentives related to the uplifts may interact with (and be offset by) companies' incentives under the Totex Incentive Mechanism.

## **5.4. SUMMARY**

Aspects of Ofgem's current prior-year adjustment uplifts are good but issues do exist. Across the current uplift approaches there is a lack of clarity of purpose that may make this aspect of the regulatory regimes difficult for companies and stakeholders to understand.

The Base Rate approach is simple but is likely to underestimate the time value of money. It is not clear this has opened clear opportunities for unintended behaviours in RIIO-1, as it is applied to incentive payments, which may be difficult for companies to influence. However, it could start to cause issues in RIIO-2 if companies are given more discretion to forecast their expenditure and incentive payments. More generally, Ofgem should take care to ensure changes in the uplifts do not unintentionally affect the calibration of the underlying incentives whose payments are being updated.

The margin approach is also simple but the lack of a clearly stated basis for the margins is a weakness. This approach may already broadly capture a short-term cost of debt but that could be improved by doing so in a more explicit and intentional manner, likely as part of aligning the approach across all the different types of adjustment.

The case for change is potentially strongest for the cost of capital approach. Both its rationale and calculation are relatively clear, but we expect it to overstate the time value of money for prior-year adjustments in many cases, resulting in uplifts that may be larger than necessary. This may encourage companies to increase the likelihood of being in under-recovery scenarios. We have not found specific cases of this arising, particularly as its effect may be cancelled out by incentives working in the other direction. However, we expect companies to have a greater ability to influence the size of prior-year adjustment uplifts in this category than the others.



## 6. OPTIONS FOR REFORM

In the preceding section we set out that there are some ways in which the current prior-year adjustments may not fulfil all the desirable features we set out in Section 4. This section sets out how Ofgem might consider changing its approach for RIIO-2 so that uplifts are simple, cost reflective and have good incentive properties.

The options discussed in this section focus on a potential new measure for prior-year adjustment uplifts set to reflect the short-term cost of debt. We considered that proposition in the following steps:

- the nature of the short-term cost of debt the measure would seek to capture (Section 6.1);
- the appropriate type of mechanism for capturing that value (Section 6.2);
- the selection of values used in the mechanism (Section 6.2); and
- how existing adjustments might be best transitioned to the new measure (Section 6.4).

We found a “semi-floating” approach based on a floating underlying rate and a fixed margin to be our preferred choice for Ofgem to implement a new time value of money measure based on the short-term cost of debt. We considered that the BoE Base Rate is still a good option for the floating underlying rate, but that SONIA also has merits as a benchmark. If Ofgem were to adopt either method, we expect the relevant margin to be 100 to 150bp on top of the floating rate, noting that it may be relevant to revisit market information closer to setting final determinations.

In the preceding sections we discussed that there may be issues in principle with using the allowed cost of capital as a prior-year adjustment rate (see Section 5), but that from a regulatory standpoint it might still be considered the appropriate option for the adjustment rate in certain circumstances. Ofgem’s allowed cost of capital acts as an anchor point for the energy networks price controls and the net present value of recovered revenues and costs through that mechanism. For this reason, it may still be considered an appropriate option for the prior-year adjustment rate where Ofgem’s objective, in the circumstances that the adjustment is applied, is to keep the network company in the same economic position following an adjustment, at the overall allowed cost of capital for the price control.

We focus on a short-term cost of debt measure as the relevant prior-year adjustment rate below, but we suggest that Ofgem also consider the circumstances where it might wish to maintain the net present value neutrality of its prior-year revenue and cost adjustments at the overall price control allowed cost of capital.

### 6.1. THE NATURE OF THE SHORT-TERM COST OF DEBT

In Section 3 we explained that the time value of money varies from case to case, making the precise nature of the short-term cost of debt hard to pin down. However, in the context of identifying a measure to use in practice, we find it useful to focus on the clearest case where a short-term cost of debt may be relevant – one where a company uses new short-term debt to cover a delay of funds in an under-payment scenario. We might expect that borrowing to have the following features:

- **Credit quality in line with notional cost of debt in main allowed cost of capital.** The prior-year adjustment regime can be thought of as being to some extent independent of the main regulatory regime – the fundamental risks related to the mechanisms are different. If anything, the mechanistic nature, and relatively short time needed to recover the payment (at least compared to the RAV) might be simpler to finance than debt related to RAV investment. Nonetheless, we are not aware of any clear basis for arguing that the credit rating should be different to that used in the allowed cost of capital.
- **Maturity of one to two years.** Companies may wish to de-risk an individual shortfall in funds through a loan matching the full length of the delay, typically two-years. However, it may be reasonable to think of prior-year adjustments as a portfolio where the company finances the net position, not the individual

adjustments. If a company expects a surplus in the following year might partly offset the deficit, it may be reasonable to finance the net position one year at a time, affording them flexibility to repay debt early. If they expect a persistent deficit instead, a maturity closer to the full delay may be more relevant as the option value of early repayment decreases. The company's portfolio of existing debt linked to the long-term financing of the RAV is not directly relevant for prior-year adjustments.

- **Floating rate structure.** We expect a floating rate structure to be more appropriate given the typically smaller size of debt requirements compared to the debt covered in the main allowed cost of capital, which tends to be fixed rate. We understand that floating rate structures are more likely to be adopted for the flexible / working capital nature of the facilities used in these cases.
- **No additional transaction fees.** We expect that for many prior-year adjustments, short-term debt would be provided through revolving debt facilities already used by the companies for a range of purposes. We would expect it to be an unusual case for the company to need to incur material transaction fees to cover extending an existing facility or creating a new one specifically for a prior-year payment. Companies may need to cover a commitment fee for keeping a facility open but that might be better seen as a fixed cost for these prior-year payments rather than something that is variable, increasing with the size of the nominal principal value being carried forward.

## 6.2. TYPE OF COST OF DEBT MEASURE

On balance, we consider a floating underlying rate plus fixed margin approach to be the preferred option for implementing this type of cost of debt.

There are three main options for implementing a short-term cost of debt mechanism: (i) a single fixed rate held constant during the price control period; (ii) a semi-floating approach using a floating underlying rate plus a fixed margin; or (iii) a fully floating all-in cost of debt measure. We consider the second option to be most likely to provide the best balance of cost reflectivity and simplicity.

- **Fixed rate cannot respond to market conditions.** A single fixed rate is undoubtedly simple and gives clarity during the price control period; however, it cannot respond to changes in market conditions. It is only a minor improvement in simplicity over the underlying rate and fixed margin approach if the underlying rate used is transparent and well understood.
- **An underlying rate with a fixed margin offers a structure that fits well with a floating rate structure, at least in normal market conditions.** A floating underlying rate plus a fixed margin is the approach currently used for revenue recovery adjustments. It is a relatively simple approach but is more cost reflective than a single fixed rate as it has parallels with how floating rate debt may be priced in practice. A downside of this approach is it is likely to work best during relatively benign market conditions as it cannot capture changes in credit margins during the price control, particularly if during periods of stress the underlying rate moves in the opposite direction to credit margins. However, this uncertainty could be considered when setting the margin upfront.
- **An all-in cost of debt mechanism has limitations for capturing the cost of debt in a floating rate structure and risks over-fitting volatile market rates.** An all-in cost of debt measure is the most complex of the three options. It would involve creating a new mechanism of comparable or greater complexity than that used as part of the cost of debt indexation mechanism in the main price control. Such a mechanism is likely to be more complex as iBoxx, the data provider for the current cost of debt mechanisms does not publish data on single-year maturities. A new mechanism would, therefore, need to consider using one or more alternative proprietary data providers such as Bloomberg or Thomson Reuters and set up suitable governance arrangements should those indices become unavailable for any reason. An all-in cost of debt mechanism might perform better than others in capturing how credit margins evolve during the price control. However, that pricing may have limitations in applicability to the sort of debt we envisage in this

case as those all-in indices are based on secondary yields on fixed rate public bond issuances rather than floating rate bank debt, which may not be quite so volatile in practice.

### **6.3. PARAMETER CHOICES**

As set out above, we expect a semi-floating cost of debt mechanism to give a good balance between simplicity and cost reflectivity. In this section we discuss its two key components:

- the floating underlying rate (Section 6.3.1); and
- the fixed margin applied on top of it (Section 6.3.2).

We find that the BoE Base Rate is still a valid option for the floating underlying rate, but that the Sterling Overnight Index Average (SONIA) is another practical alternative. If Ofgem were to use either approach, we would currently expect the relevant margin to be in the range of 100 to 150bp on top of the floating rate, noting that it may be appropriate to revisit relevant market information closer to its final determinations.

#### **6.3.1. Floating underlying rate**

##### **BoE Base Rate**

Ofgem currently uses the BoE Base Rate as a floating underlying rate in the margin approach it uses for revenue recovery corrections. It is a clear and simple approach and has clear regulatory precedent from RIIO-1 and Ofcom. We consider this to remain a viable option for Ofgem to consider using.

A limitation of the Base Rate is that it is not a benchmark conventionally used by banks to price floating rate debt. We considered two potential options that are used in practice: LIBOR and SONIA. We find that SONIA could be a workable option for Ofgem to consider as an alternative to the Base Rate and a preferable option to LIBOR.

##### **LIBOR**

LIBOR calculates interest rate benchmarks of the cost of funding for large international banks in the wholesale unsecured funding market.<sup>21</sup> The Intercontinental Exchange (ICE) publishes LIBOR rates for five currencies, including GBP, covering maturities from overnight/spot to twelve months. Banks widely use LIBOR for pricing floating rate loans, often using the three-month and six-month tenors.

A major limitation for the use of LIBOR in RIIO-2, however, is that it may become unavailable, potentially as early as the start of 2022, just nine months into the first year of RIIO-GD2 and RIIO-T2. This uncertainty means Ofgem would need to prepare to replace the measure shortly after introducing it. As such, we do not expect LIBOR rates to be right for use as a floating underlying rate for prior-year adjustments, even if it performs well on cost reflectivity grounds.

##### **SONIA**

SONIA is an interest rate benchmark based on actual transactions and reflects the average of the interest rates that banks pay to borrow sterling overnight from other financial institutions. The BoE administers SONIA and estimates that it is used to value around £30 trillion of assets each year.<sup>22</sup>

SONIA is a well-established metric and was last reformed in 2018, at which point the BoE took over responsibility for its calculation and publication from the Wholesale Market Brokers Association. It is the preferred successor to LIBOR in sterling markets.

A limitation of SONIA is the absence of term rates: only the overnight rate is available. However, this means it tends to run close to the BoE Base Rate, an overnight deposit rate available to eligible banks. Figure 6.1 shows this close

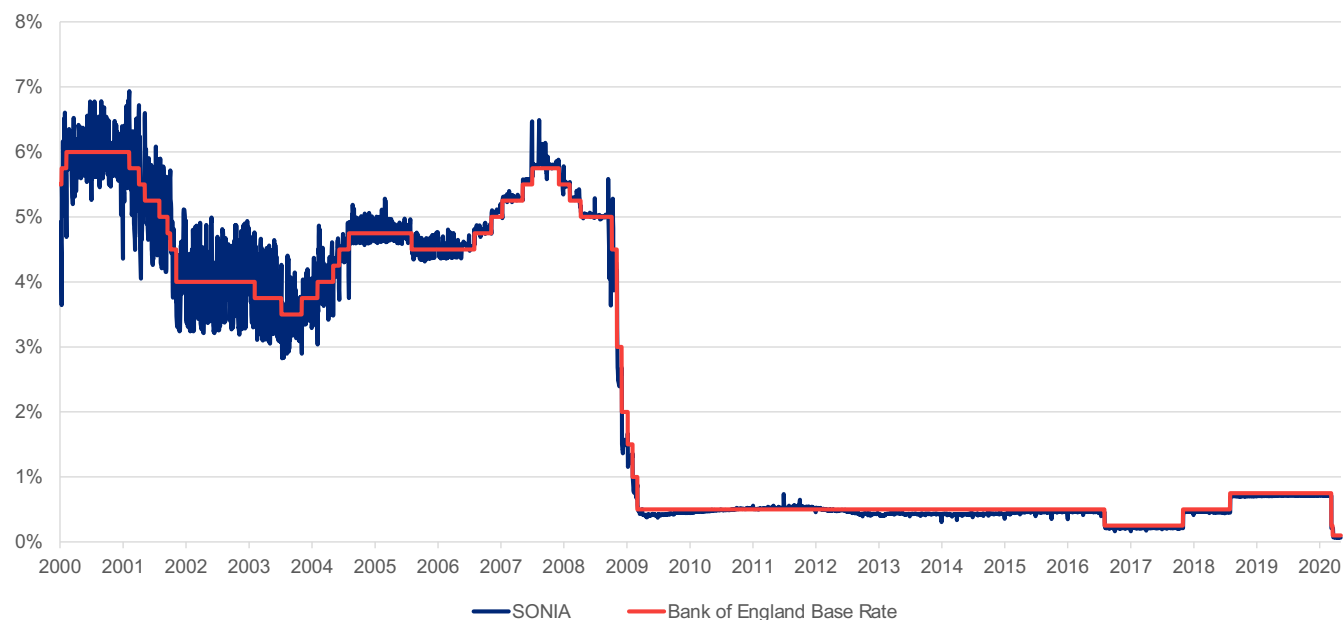
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<sup>21</sup> See the LIBOR webpage on [theice.com](https://theice.com)

<sup>22</sup> See the SONIA interest rate benchmark webpage on [bankofengland.co.uk](https://bankofengland.co.uk)

relationship, which has tightened as the BoE changed how it implements the Base Rate in 2006 and the start of quantitative easing during the Global Financial Crisis. We understand that at least some deviations between the two series arise from certain institutions captured in SONIA not having accounts with the BoE.<sup>23</sup>

Figure 6.1: SONIA and BoE Base Rate (Jan 2000 to April 2020)



Source: CEPA analysis of BoE data

The close movement of SONIA and the BoE Base rate means any cost reflectivity gain from moving to SONIA may be small. However, we understand Ofgem is considering using SONIA in the primary cost of debt indexation for NGET SO. Therefore, transitioning to SONIA could improve the consistency, and hence simplicity, of how Ofgem treats allowances based on a notional floating rate cost of debt.

### 6.3.2. Fixed margin

We analysed financial market data from Bloomberg to assess the range for a fixed margin to apply in a semi-floating cost of debt measure. We assumed that either the BoE Base Rate or SONIA could be the underlying floating rate that the margin would be set on top of, noting that any difference between the two is likely to remain small.

We found that at this point in time, it may be appropriate for Ofgem to consider setting a margin in the range of 100 to 150bp. That range, and any point value selected within it, would need to be refreshed and finalised based on an updated assessment of market information closer to the time Ofgem's RIIO-2 Final Determinations.

### Approach

We assessed information on the historic and potential future size of the relevant margin using indices that we selected to capture the key features of the short-term cost of debt that we noted in Section 6.1.

To do this we first collected information from Bloomberg on the yield on one-year corporate bonds with a rating of A and BBB, the credit rating assumption that Ofgem has used for the RIIO-1 cost of debt indexation mechanisms.<sup>24</sup> We then compared those yields to the market price of one-year SONIA swap rates. The corporate bond yields capture most features we found relevant for setting the margin, except that it assumes a fixed rate interest coupon.

<sup>23</sup> p11-14, Bowman et al. (March 2010) "Interest on Excess Reserves as a Monetary Policy Instrument: The Experience of Foreign Central Banks", available on [federalreserve.gov](https://www.federalreserve.gov)

<sup>24</sup> We understand that Ofgem is considering moving from iBoxx A and BBB-rated bond yields to a similar series on yields for utilities. Bloomberg does not publish a generic utilities index, only for utilities with specific ratings.

The SONIA rate allows us to approximate the margin that lenders require from companies over that one-year timeline.<sup>25</sup> Box 2 below gives a brief background on interest rate swaps.

### Box 2: Interest rate swaps

An interest rate swap is a forward contract between two parties to exchange one stream of future interest payments for another. A wide array of interest rate swap contracts exist in practice, with “vanilla” swaps between a floating rate and a fixed rate being the most common. A SONIA swap is just one example.

Two parties may wish to enter a SONIA swap contract if one has a debt linked to SONIA (but wants a fixed interest rate) and another has a fixed rate debt (but wants to have exposure to SONIA).

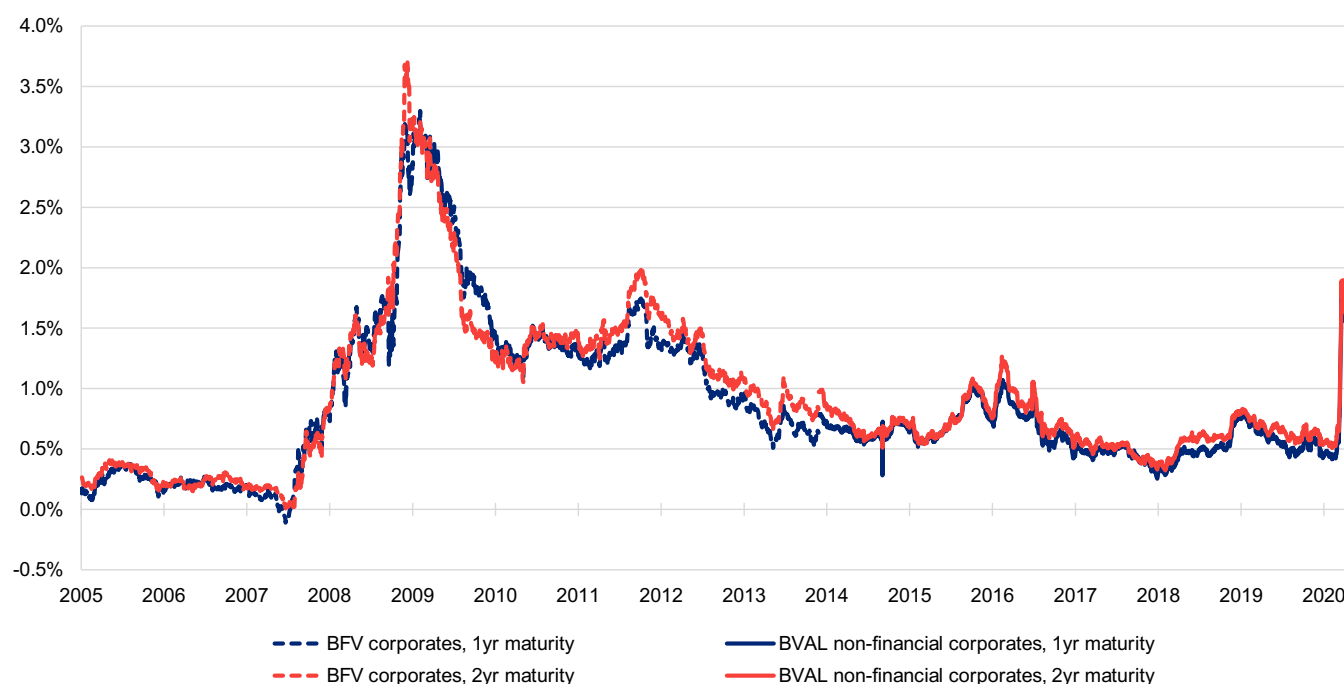
A key element of a swap contract is a fixed coupon that applies for its duration. When the SONIA rate is higher than that level, the party with the SONIA-priced debt receives the difference from the other party; when SONIA is below the fixed coupon, they instead pay out the difference.

If the swap market is liquid, the fixed coupon should offer a reasonable market-driven forecast of the expected level of the underlying rate over the period of the contract. As such, one-year SONIA swap rates effectively give a market-driven forecast of SONIA over the next twelve months.

## Historic margins

The following chart shows how margins on one-year and two-year maturity corporate bonds have moved relative to SONIA swaps of the corresponding maturity since 2005. We focus on the average of yields on A and BBB rated debt, examining margins for non-financial corporate debt of that rating once they become available in late 2013.

Figure 6.2: A/BBB margins over SONIA swaps (Jan 2005 - Apr 2020)



Note: CEPA analysis of Bloomberg data <sup>26</sup>

As shown in Figure 6.2, margins over SONIA jumped recently, ending several years of relative stability where they fell broadly in the range of 50 to 100bp. The recent jump, however, has parallels with that seen over a decade earlier in the Global Financial Crisis which resulted in elevated margins.

<sup>25</sup> We compare the margin by subtracting the SONIA swap rate from bond yields. Unfortunately, Bloomberg does not supply asset swap margins vs. SONIA (or LIBOR) for these series.

<sup>26</sup> Values based on Bloomberg BFV corporate yields provided until 26<sup>th</sup> November 2013, at which point BVAL non-financial corporate yield indices become available.

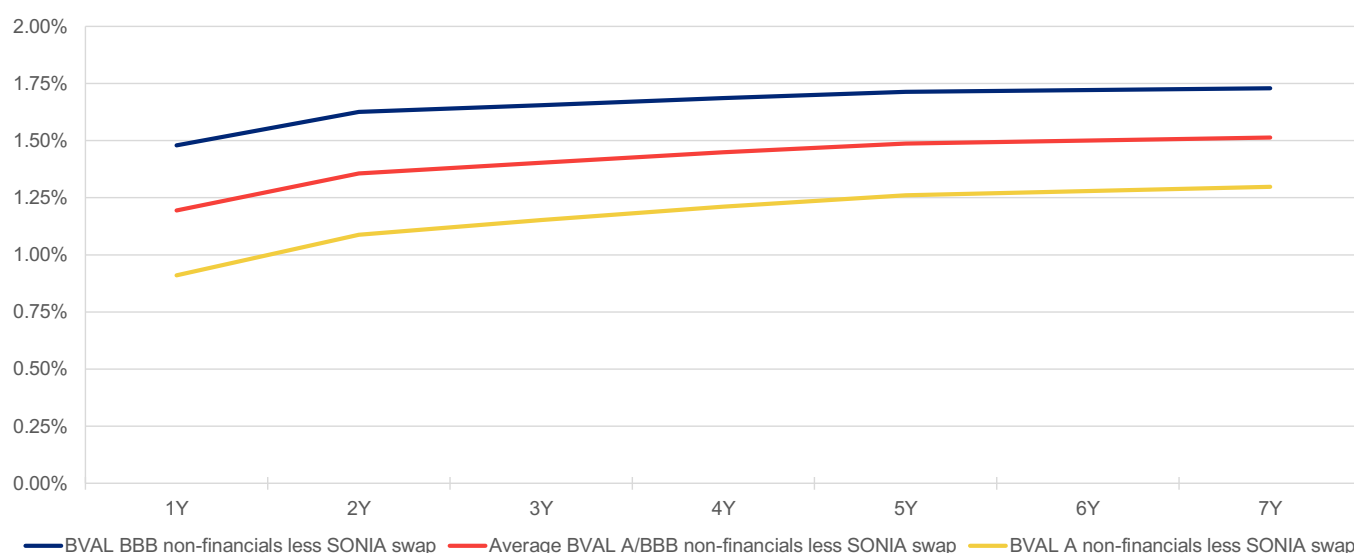
## Future margins

It is not possible to know how margins may move during the RIIO-2 price controls or how their movement during the ongoing COVID-19 crisis might compare to that seen during the Global Financial Crisis.

One observation that supports a view that the spike may not be quite as large is that the largest margins during the Global Financial Crisis may partly reflect how markets lagged behind the fast reductions to the BoE Base Rate in 2008 and 2009, which can be seen above in Figure 6.1. There is currently some debate whether the BoE will move the Base Rate into negative territory but even if that were the case, it seems unlikely to reduce rates quite so far.

This view is supported by current market pricing of the margins priced in over longer maturities. Figure 6.3 below shows the margin of the Bloomberg A and BBB non-financial corporate bond yields over SONIA swaps on 22<sup>nd</sup> May 2020 over a one to seven-year horizon. The modest rate of increase of the curve shows that financial markets are only pricing in a modest increase in the margin over its current level.

Figure 6.3: A, BBB and A/BBB corporate bond yield margins over SONIA swaps (22<sup>nd</sup> May 2020)



*Note: CEPA analysis of Bloomberg data*

With the ongoing economic uncertainty, it is possible there could be a material shift in the next few months. We would recommend that Ofgem refresh this analysis closer to the time of its RIIO-2 Final Determinations.

## Range

Even if the margins did fall back towards the levels seen in recent years, the 100bp margin used by Ofcom, which itself was supported by convention of the High Court in commercial cases and by the Competition Appeals Tribunal when awarding interest on penalties<sup>27</sup> may provide a reasonable focal point for a lower bound.

Figure 6.3 above suggests A/BBB-rated margins of around 150bp by the end of RIIO-T2/GD2, the margin currently used for RIIO-T1/GD1 for revenue recovery corrections. Increasing the margin further above 150bp could reduce the risk of periods where the prior-year adjustment uplift does not cover lending costs, but the analysis presented above suggests that while that is possible, such periods may be temporary. Current evidence suggests it would be difficult to justify a margin as high as 200bp, the margin used for RIIO-T1.

### 6.3.3. Summary

In this section we analysed the two components of a semi-floating cost of debt mechanism: (i) the floating underlying rate; and (ii) the fixed margin. We found that the BoE Base Rate is still a valid option for the floating

<sup>27</sup> pp25-26, Ofcom (May 2017)



underlying rate, but that SONIA is another practical alternative. If Ofgem were to use either approach, we would currently expect the relevant margin to be in the range of 100 to 150bp on top of the floating rate, noting that it may be appropriate to revisit relevant market information closer the when it makes its final determinations.

## **6.4. TRANSITION TO THE NEW MEASURE**

We consider the approach set out above provides a practical option for a new time value of money measure to be applied to prior-year adjustments in RIIO-2. However, it is still relevant to consider if that measure would fit better with all adjustments, as well supporting arrangements that may be needed to address potential weaknesses.

We also note that we would expect Ofgem to ensure all payments related to RIIO-1 price controls continue to apply the same prior-year adjustment uplifts as are currently in place. Any changes would only apply to allowances applying from the start of the new price control.

### **Historic revenue and expenditure**

The approach set out above fits well with allowances set based on historic revenue or expenditure as the logic of a short-term cost of debt being the time value of money corresponds with how we might expect companies to treat these cases in practice. There may be a good case to move them to the new measure.

However, this is also one of the areas where Ofgem might also wish to maintain the net present value neutrality of its price control adjustments at the allowed cost of capital. These adjustments may currently use the allowed cost of capital as Ofgem is seeking to maintain the net present value neutrality of variations in funded expenditure under its overall price control discount rate.

### **Revenue corrections**

The new measure also fits well with the treatment of revenue under and over-recovery. It is like the approach already used for revenue corrections, so the need for change is less pressing than for the preceding category of adjustments. However, there would be strong grounds to simplify the regime by moving these adjustments into a new measure based on the short-term cost of debt, if Ofgem introduces one.

We would not recommend removing the use of penalty rates for large revenue collection errors. However, we have not reviewed that in mechanism in any detail.

### **Incentives**

We expect the new measure could also work for incentive payments despite them not relating to historical cash flows. Using a time value of money fits with how Ofgem implements incentive payments – treating them as if accrued in the year they relate to. In RIIO-1, Ofgem uses the cost of capital for some incentive adjustments and the BoE Base rate for others, so there would be some benefit from simplifying their treatment with a single approach.

Our primary concern regarding incentives is that the change in the size of uplifts could give unintended changes in the strength of the underlying incentives – those using the cost of capital would become weaker and those using the BoE Base Rate would become stronger. As such, Ofgem would need to approach with caution any wholesale move of incentives to a new measure. We would expect new incentives to adopt the new measure without problems, but that Ofgem would need to approach existing ones more deliberately, ensuring it could mitigate any unintended changes in their strength.

## **6.5. SUMMARY**

In this section we set out the basis for our findings on how Ofgem might consider changing its approach for RIIO-2 so that prior-year adjustment uplifts are simple, cost reflective and have good incentive properties. We found options for a new measure that Ofgem might consider introducing and how current adjustments might transition to it, noting that we would expect Ofgem to close-out the RIIO-1 price controls using the same prior-year adjustment uplifts as currently apply.

We considered a “semi-floating” approach based on a floating underlying rate and a fixed margin the preferred choice for Ofgem to implement a new time value of money measure based on the short-term cost of debt. We found that the BoE Base Rate is still a reasonable option for the floating underlying rate, but that SONIA also has merits as a benchmark. If Ofgem were to adopt either method, we expect the relevant margin to be 100 to 150bp on top of the floating rate, noting that it may be relevant to revisit market information closer to setting final determinations.

We expect that there would be a good case for Ofgem to use the new measure as part of prior-year adjustment uplifts for allowances set based on historic revenue or expenditure, although we note that this is one category of adjustments where Ofgem may also wish to maintain the NPV neutrality of the adjustment at the allowed cost of capital if that is the objective it is seeking within the price control as a whole. The case for change for revenue recovery corrections is weaker when considered in isolation, but we see value in it being merged with the others on simplicity grounds. Ofgem may benefit from case-by-case assessments of if it should transition individual incentives to the new measure; we see the new measure as being valid for them in theory, but foresee caution being needed to avoid unintentional changes in their strength.



## 7. CONCLUSIONS

The time value of money is the central concept for prior-year adjustment uplifts. However, few regulators provide much information on why they make prior-year adjustments in the ways they do. Ofcom was the only regulator we found to have discussed the issue in detail, justifying an approach based on the short-term cost of debt. However, other regulators continue to use different approaches, including uplifts based on the allowed cost of capital. Ofwat is an example of a regulator that adopts the latter approach.

The difference in approaches across regulators may reflect alternative views on how prior-year adjustments should work in the context of the regulatory framework. Some regulators might see it a fundamental anchor point of the regulatory package that the net present value of all revenues and costs should be protected using the allowed cost of capital set at the price control determination, as the relevant discount rate for the price control. In such cases, the allowed cost of capital would be consistent with the overall regulatory approach.

In this paper, we also consider a different rationale for prior-year adjustment uplifts, where they are designed to capture the time value of money of the context where they apply. This is similar to the case noted above, except where it can be argued that the time value of money differs significantly from the allowed cost of capital. In that context, we considered Ofgem's time prior-year adjustment mechanisms from two main angles:

- **The marginal cost of capital:** what uplift would preserve the net present value of the price control for investors if revenues are switched between periods *during* the control?
- **Opportunity costs and benefits:** what value would investors gain or lose if no uplifts were applied in an over-recovery or under-recovery scenario?

From the perspective of the marginal cost of capital, our analysis suggested that the way Ofgem treats prior-year adjustments may entail a materially different, lower level of risk for companies compared to the main allowed cost of capital. Therefore, it may be possible to maintain the net present value of the price control revenues and costs for the investor even when using a much lower rate, potentially in line with the short-term cost of debt.

When we considered the issue from the perspective of the company's opportunity cost or benefit in under-payment and over-payment scenarios, our analysis also pointed to the short-term cost of debt as the appropriate time value of money and potentially prior-year adjustment rate. Reflecting Ofcom's findings, the short-term cost of debt under a range of scenarios seems to capture the costs and benefits a network company would face in the event of under or over recoveries of revenues. If prior-year adjustments are considered to have a different risk profile to cash flows under the general price control, i.e. low risk with payment independent of the company's ongoing performance, there are reasons again to consider a short-term cost of debt the appropriate adjustment rate.

We identified cases where the short-term cost of debt may not be a perfect fit for the marginal cost of capital or companies' opportunity cost/benefit. However, those cases served more to raise issues to be addressed by the wider regulatory regime, rather than being ones the uplifts themselves would be well placed to address. For example, the short-term cost of debt might work less well in a scenario where covering a large under-recovery with debt would put the company in breach of its existing debt covenants. It may be appropriate for Ofgem to consider options to reduce the risk of such scenarios arising – e.g. by mitigating the scale of under or over-recoveries – rather than seeking to mitigate its impacts through prior-year adjustment uplifts.

We consider that simplicity, cost reflectivity and good incentive properties are desirable features for any prior-year adjustment mechanism.

We used those features to assess the RIIO-1 mechanisms and potential options to improve them for RIIO-2, finding that aspects of the current prior-year adjustment uplifts were good but that all three of Ofgem's main approaches had issues of varying degrees, given the range of circumstances in which they apply. We investigated how Ofgem might consider changing its approach for RIIO-2 so that uplifts are simple, cost reflective and have good incentive properties.

As discussed above, one option would be for Ofgem to use the nominal allowed cost of capital in RIIO-2, as some other regulators (e.g. Ofwat) have done. This would be a simple and transparent single prior-year adjustment rate, and for the reasons discussed above, would be consistent with Ofgem using the allowed cost of capital as an anchor point to maintain the net present value of all revenues and costs under its price controls.

However, through our work we also identified some issues with using the allowed cost of capital as the adjustment rate. In certain circumstances it performs relatively poorly on cost-reflectivity grounds – i.e. as a reflection of the company's time value of money for the prior-year adjustments. As a consequence, it might in principle create unintended incentives for network companies; for example, to intentionally under-recover allowed revenues.

Based on our findings on the time value of money for prior-year adjustment uplifts, we developed another option for Ofgem to consider for RIIO-2, based on a new short-term cost of debt measure. The table below summarises the key features of this new option and how Ofgem might transition across the current arrangements for uplifting allowances and/or revenue recovery errors following a delay.

*Table 7.1: Short-term cost of debt based prior-year adjustment rate for RIIO-2*

Feature	Description
<b>New measure</b>	
Basis for measure	Short-term cost of debt with a credit quality in line with notional cost of debt in main allowed cost of capital, a maturity of one to two years and a floating rate structure
Structure	"Semi-floating" structure with a floating underlying rate plus a fixed margin, applied symmetrically to positive and negative prior-year adjustments
Underlying rate	BoE Base Rate or the Sterling Overnight Index Average (SONIA)
Margin	100-150bp, updated based on the margin of bond yields over SONIA swap rates
<b>Transition arrangements</b>	
Expenditure and revenue	Suitable for direct transition to new measure
Revenue recovery errors	As above, but with penalty rates remaining in place for large errors
Incentives	Suitable both for new and existing incentives, but Ofgem would need to ensure it can mitigate any unwanted changes in existing incentives' strength
RIIO-1 close-out	Retain existing prior-year adjustments

Source: CEPA

Overall, we would reflect that in some ways the current arrangements have worked well, and it is not surprising that they have persisted as is. However, given that Ofgem is reviewing the current prior-year adjustments as part of RIIO-2 policy development, there is an opportunity to consider if the current uplift rates remain fit for purpose.

We have explored a number of different options within this short technical report, including using the allowed cost of capital for RIIO-2 and a new short-term cost of debt measure as the prior-year adjustment rate. Both may be appropriate depending on the objective and specific circumstances but may also raise various issues if used as a common adjustment rate for all prior-year adjustments.

Given the complexities of the issues, we suggest that the options are consulted on to allow input from a range of different industry stakeholder groups.

## Appendix A **RIIO-1 PCFM PRIOR-YEAR ADJUSTMENT UPLIFTS**

Tables A.1 and A.2 present company-by-company results from our analysis of the size of the uplifts applied through prior-year adjustments in the RIIO-1 PCFMs, both in absolute terms and in relative terms compared to Base Revenue.

Our analysis sought to isolate the *nominal principal* values carried forward from earlier years during successive annual iteration processes and the *uplifts* that Ofgem applied on top of them. The values we present in this appendix are the estimated uplifts only.

We calculated the PCFM uplifts by comparing two values:

- MOD values published in the latest PCFMs;<sup>28</sup> and
- our own calculations of the MOD values that would have applied if there had been no uplift, not even for inflation.

We calculated the second set of values using “Recorded recalculated base revenue” values found in the latest published PCFM models, but equivalent results can be found by decomposing the “catch-up” values calculated on the “Revenue” sheets of the models published from each annual iteration process. The uplift in nominal £m value is calculated as the difference between the nominal “catch-up” value and the nominal “Recalculated base revenue delta” values from earlier years.

For our calculations, we needed to convert the PCFM MOD and base revenue values (presented in constant prices) to nominal terms. For simplicity, we used the RPI inflation forecasts contained within the respective models.

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<sup>28</sup> Ofgem PCFMs can be found on [ofgem.gov.uk](https://www.ofgem.gov.uk)

Table A.1: Absolute value of RIIIO-1 PCFM prior-year adjustment uplifts (nominal £m)

Sector	Company	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
<b>Gas and electricity transmission</b>								
GT1	NGGT TO	0.4	-1.7	-1.1	-1.1	-11.2	-9.1	1.3
GT1	NGGT SO	0.0	-1.9	0.8	1.4	0.0	2.1	-0.6
ET1	SHE-T	1.6	2.4	-0.3	-3.6	0.5	0.1	0.7
ET1	SPTL	1.0	-1.7	-1.8	-0.4	1.4	1.7	1.2
ET1	NGET TO	0.8	-7.1	-11.8	-25.3	-35.0	-33.2	-27.5
ET1	NGET SO	0.1	-0.1	2.1	0.1	3.8	8.5	1.3
<b>Annual average</b>		<b>0.6</b>	<b>-1.7</b>	<b>-2.0</b>	<b>-4.8</b>	<b>-6.8</b>	<b>-5.0</b>	<b>-3.9</b>
<b>Gas distribution</b>								
GD1	East	0.0	-0.1	-0.4	-0.6	-0.8	0.8	0.0
GD1	London	0.0	0.2	0.5	-2.1	-1.5	-0.6	-0.4
GD1	North West	0.0	-0.5	2.1	-0.6	-1.2	-1.2	-0.5
GD1	West Midlands	0.0	-0.2	0.2	-0.5	-0.4	-0.9	-0.5
GD1	Northern	0.2	-0.5	-0.4	-0.5	-0.5	-0.4	0.0
GD1	Scotland	0.0	-2.0	0.2	-0.3	-1.2	-1.3	-0.3
GD1	Southern	0.0	-3.2	0.8	-1.2	-1.0	-1.7	-1.4
GD1	Wales and West	0.1	-1.0	-1.5	-1.4	-1.7	-1.5	-2.3
<b>Annual average</b>		<b>0.0</b>	<b>-0.9</b>	<b>0.2</b>	<b>-0.9</b>	<b>-1.0</b>	<b>-0.8</b>	<b>-0.7</b>
<b>Electricity distribution</b>								
ED1	ENWL			-0.3	-0.4	-1.1	-0.8	0.2
ED1	NPgN			-0.1	-0.3	-0.4	-0.8	-0.6
ED1	NPgY			0.2	-0.4	-1.0	-1.4	-0.4
ED1	WMID			0.2	-0.4	-1.2	-1.1	-2.3
ED1	EMID			0.2	-0.4	-1.2	-1.1	-2.3
ED1	SWALES			0.0	-0.4	-0.7	-0.3	-1.2
ED1	SWEST			-0.1	-0.5	-1.1	-0.1	-1.3
ED1	LPN			-0.1	-2.9	-3.4	-1.9	-1.9
ED1	SPN			-0.2	-2.3	-5.3	-2.7	-2.0
ED1	EPN			0.1	-2.4	-5.8	-1.8	-1.1
ED1	SPD			0.1	-0.5	-0.5	-0.8	-0.1
ED1	SPMW			-0.3	-0.8	-2.7	-1.2	0.8
ED1	SSEH			-0.2	-0.6	-0.4	-1.0	0.3
ED1	SSS			-0.8	-2.0	-2.0	-1.4	-1.4
<b>Annual average</b>				<b>-0.1</b>	<b>-1.0</b>	<b>-1.9</b>	<b>-1.2</b>	<b>-1.0</b>

Source: CEPA analysis of PCFM models

Table A.2: Relative value of RII0-1 PCFM prior-year adjustment uplifts (% of base revenue)

Sector	Company	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
<b>Gas and electricity transmission</b>								
GT1	NGGT TO	0.1%	-0.3%	-0.2%	-0.1%	-1.3%	-1.3%	0.2%
GT1	NGGT SO	0.0%	-2.4%	1.1%	1.5%	0.0%	2.2%	-0.5%
ET1	SHE-T	1.3%	1.7%	-0.1%	-1.4%	0.2%	0.0%	0.3%
ET1	SPTL	0.4%	-0.6%	-0.6%	-0.1%	0.5%	0.5%	0.4%
ET1	NGET TO	0.0%	-0.4%	-0.7%	-1.4%	-2.1%	-1.9%	-1.7%
ET1	NGET SO	0.1%	-0.1%	1.4%	0.0%	2.2%	4.3%	0.4%
<b>Annual average</b>		<b>0.3%</b>	<b>-0.4%</b>	<b>0.2%</b>	<b>-0.3%</b>	<b>-0.1%</b>	<b>0.6%</b>	<b>-0.1%</b>
<b>Gas distribution</b>								
GD1	East	0.0%	0.0%	-0.1%	-0.1%	-0.1%	0.1%	0.0%
GD1	London	0.0%	0.0%	0.1%	-0.5%	-0.4%	-0.1%	-0.1%
GD1	North West	0.0%	-0.1%	0.5%	-0.1%	-0.3%	-0.3%	-0.1%
GD1	West Midlands	0.0%	0.0%	0.0%	-0.2%	-0.1%	-0.3%	-0.1%
GD1	Northern	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	0.0%
GD1	Scotland	0.0%	-0.7%	0.1%	-0.1%	-0.3%	-0.4%	-0.1%
GD1	Southern	0.0%	-0.5%	0.1%	-0.2%	-0.1%	-0.2%	-0.2%
GD1	Wales and West	0.0%	-0.2%	-0.4%	-0.3%	-0.4%	-0.3%	-0.5%
<b>Annual average</b>		<b>0.0%</b>	<b>-0.2%</b>	<b>0.0%</b>	<b>-0.2%</b>	<b>-0.2%</b>	<b>-0.2%</b>	<b>-0.1%</b>
<b>Electricity distribution</b>								
ED1	ENWL			-0.1%	-0.1%	-0.3%	-0.2%	0.0%
ED1	NPgN			0.0%	-0.1%	-0.1%	-0.3%	-0.2%
ED1	NPgY			0.1%	-0.1%	-0.3%	-0.4%	-0.1%
ED1	WMID			0.0%	-0.1%	-0.3%	-0.2%	-0.5%
ED1	EMID			0.0%	-0.1%	-0.3%	-0.2%	-0.5%
ED1	SWALES			0.0%	-0.2%	-0.3%	-0.1%	-0.5%
ED1	SWEST			0.0%	-0.2%	-0.3%	0.0%	-0.4%
ED1	LPN			0.0%	-0.7%	-0.8%	-0.5%	-0.4%
ED1	SPN			-0.1%	-0.7%	-1.5%	-0.8%	-0.5%
ED1	EPN			0.0%	-0.4%	-1.0%	-0.3%	-0.2%
ED1	SPD			0.0%	-0.1%	-0.1%	-0.2%	0.0%
ED1	SPMW			-0.1%	-0.2%	-0.8%	-0.4%	0.2%
ED1	SSEH			-0.1%	-0.2%	-0.1%	-0.3%	0.1%
ED1	SSES			-0.2%	-0.4%	-0.4%	-0.3%	-0.3%
<b>Annual average</b>				<b>0.0%</b>	<b>-0.3%</b>	<b>-0.5%</b>	<b>-0.3%</b>	<b>-0.2%</b>

Source: CEPA analysis of PCFM models



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