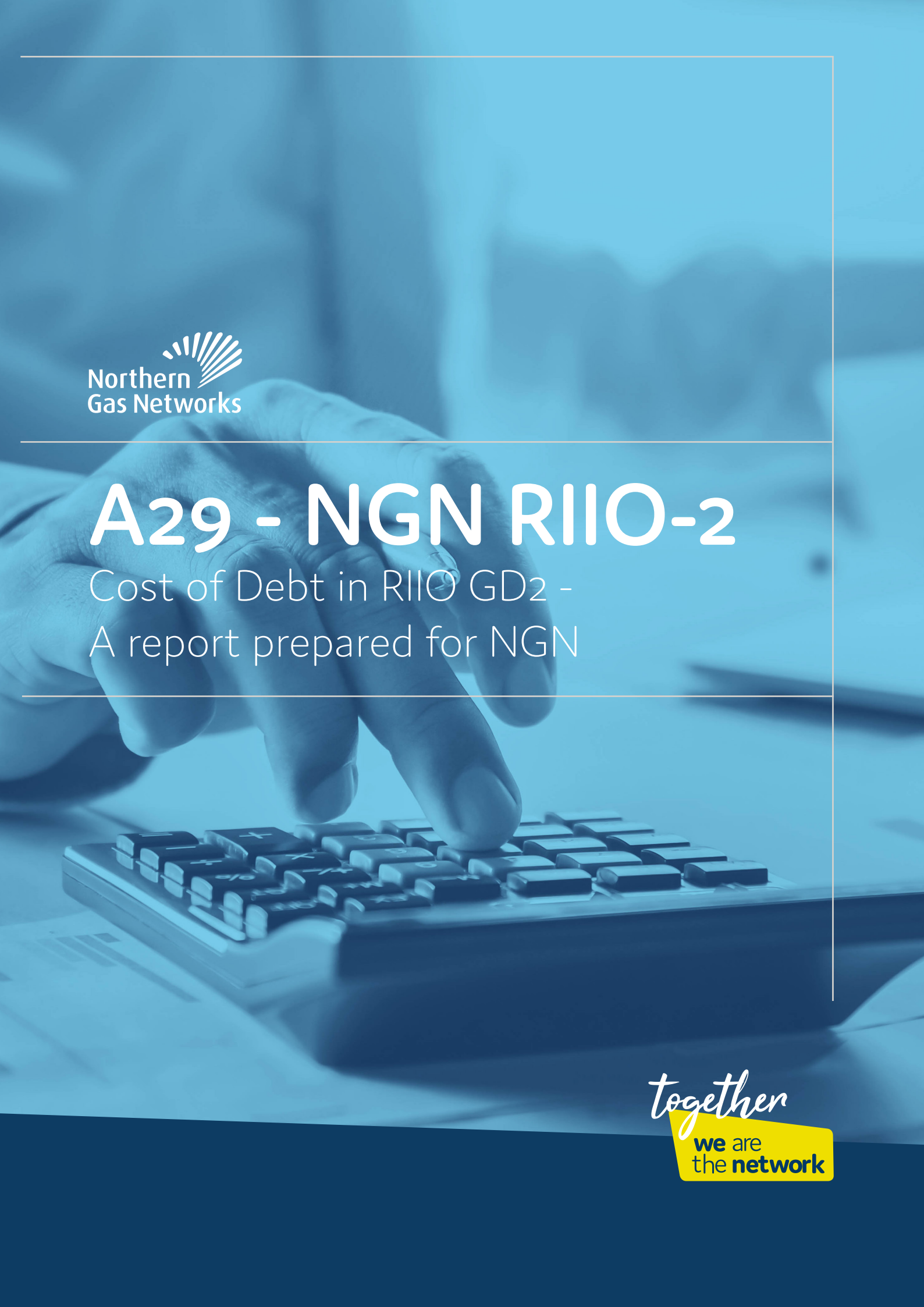


Northern Gas Networks

A29 - NGN RIIO-2

Cost of Debt in RIIO GD2 - A report prepared for NGN

together we are the network

FINAL REPORT

frontier economics

COST OF DEBT IN RIIO GD2

A report prepared for NGN

March 2019

CONTENTS

EXECUTIVE SUMMARY

Introduction

Frontier Economics Ltd has been commissioned by Northern Gas Networks (NGN) to provide quantitative analysis on the ways in which Ofgem may choose to set cost of debt allowances for the RIIO GD2 period.

Our report provides a description of Ofgem's existing approach to assessing and allowing for the cost of debt for licenced energy networks when setting price controls. This is based on our review of the precedent established during the implementation of the RIIO-1 price control, and the documents published by Ofgem so far in respect of the possible regulatory approaches for RIIO-2.

The main focus of the report is to model the various options that Ofgem has set out for future debt allowances in order to understand their likely effect, given the existing debt books of the GDNs. Our quantitative analysis of the options that remain likely to be considered by Ofgem covers:

- the existing GD1 mechanism based on a 10-year rolling average of the iBoxx A and BBB indices, updated annually;
- a recalibrated rolling average based on a different length of average period;
- a trombone-style average mechanism similar to the one employed for ED1; and
- a partial indexation method similar to the one proposed by Ofwat for PR19.

We also identify a number of key policy questions relevant for GD2 in particular, which include:

- the current level of the cost of debt for Cadent;
- a potential sharing factor on the mechanism;
- the use of appropriate inflation measure to convert the nominal iBoxx yield data into real terms; and
- the effect of derivatives.

Modelling results

The report assesses the various options that Ofgem may adopt using a cost of debt model that we have developed. We present our results regarding the likely allowance produced by these different options, compared to the projected actual cost of debt at the sector average. This then affords the opportunity to judge whether a certain mechanism is likely to over/under fund the sector cost of debt.

We also present sensitivity scenarios to capture the potential effect from different cases for future interest rates, companies' ability to raise debt below assumed credit rating, and financial derivatives.

Key findings

Our analysis has demonstrated that Ofgem has at its disposal the tools necessary to develop rolling-average indexation mechanisms (rollers) that can deliver on any of the potential policy objectives that it may select. In our analysis, we have not varied all of the possible calibration levers that Ofgem has highlighted in its consultation so far, and yet we have been able to develop policy options that track reasonably closely the sector average cost of debt.

Practicality

We see no practical obstacles to Ofgem implementing policies consistent with the direction signalled by its consultation papers.

Our analysis provides an indication of the potential effect of different interest rate cases on outturn allowances.

Treatment of Cadent's debt costs

Our modelling analysis makes clear that one important policy choice in relation to the cost of debt approach for GD2, if Ofgem aims to fund the sector average with an indexation mechanism, is the treatment of Cadent's current debt book.

Our analysis shows that if Cadent's debt book is taken into the sector average without adjustment, this would under-estimate the true cost of debt of the sector by a large margin. As a result, the entire sector would be under funded in relation to the cost of debt. Doing so would imply a potential failure of Ofgem in discharging its financing duties.

If the current debt book of Cadent is appropriately adjusted, or discarded for the purpose of the sector average calculation, then it appears highly likely from our modelling that the current 10-year roller deployed in GD1 would not adequately fund the sector's cost of debt.

We have found a number of alternative designs from Ofgem's own proposed options that could address this issue. These include a 13-year roller, a 11-15-year trombone, or a partial indexation.

Credit rating and derivatives

Our modelling also shows sensitivity scenarios where GDNs only manage to raise debt at BBB rating and where the effect of derivatives is taken into account (results relying on NGN's information on the effect of derivatives). Our sensitivity analysis shows that the 13-year roller and 11-15-year trombone would underfund the sector average.

In addition, Ofgem may choose to take into account the effect of derivatives. Assuming the information on the impact of derivatives on sector's average cost of debt provided by NGN is accurate, the roller window would need to be increased to 15 years and the calibration of trombone would need to be adjusted to 13-17 years.

Interest rate volatility

Inevitably, the outturn results from any rolling mechanism will be sensitive to future interest rate evolution. Ofgem's policy in respect of the cost of debt is to design a rolling mechanism that covers future debt costs in expectation. Given uncertainty over future levels of interest rates and corporate debt costs, all such mechanisms may over or under compensate companies for future incurred debt costs.

As a matter of principle, exposure to interest rate forecast error can be minimised over time by matching Ofgem's roller design. For example, suppose Ofgem decides to use a 20-year roller. Then a GDN could match its actual cost of debt reasonably closely to the allowance by issuing staggered 20-year tenor debt, refinancing 5% of its debt book each year – irrespective of what happens to future interest rates (although we note that such a policy may be relatively costly for a smaller GDN that would then be raising relatively small sums annually).

Sensitivity to future interest rate forecast error will increase if:

- there is a high proportion of legacy debt issued with timing that does not match the roller selected by Ofgem; and/or
- GDNs raise future debt in a different annual proportion and/or timing assumed by the roller used by Ofgem.

However, once existing legacy debt has been retired, and as long as GDNs raise future debt finance consistent with the roller used by Ofgem, then there should be reduced over/under-compensation.

Our empirical modelling results suggest that the trombone average in Option A is largely resilient to interest rate uncertainty for the period of GD2. In addition, the partial indexation of option B is also relatively resilient to interest rate uncertainty, if the weighting between new and embedded debt matches the actual proportion. If Ofgem reconsidered these two options carefully, it may find strong attraction to them, particularly in a regulatory environment where there is pressure to ensure that outperformance is justified.

1 INTRODUCTION

Frontier Economics Ltd has been commissioned by Northern Gas Networks (NGN) to provide quantitative analysis on the ways in which Ofgem may choose to set cost of debt allowances for the RIIO GD2 period.

Our report provides a description of Ofgem's existing approach to assessing and allowing for the cost of debt for licenced energy networks when setting price controls. This is based on our review of the precedent established during the implementation of the RIIO-1 price control, and the documents published by Ofgem so far in respect of the possible regulatory approaches for RIIO-2.

The main focus of the report is to model the various options that Ofgem has for setting future debt allowances in order to understand their likely effect, given the existing debt books of the GDNs.

The remainder of the report is structured as follows:

- Section 2 starts with background context on the regulatory precedent on Ofgem's cost of debt allowance policy and summarises the relevant discussions to date within the RIIO2 framework;
- Section 3 discusses the key policy questions for GD2 in particularly, given the current and forecast cost of debt of GDNs; and
- Section 4 quantitatively assesses each of the potential options using our cost of debt modelling exercise, compared to the likely sector average for GD2 (excluding Cadent).

2 BACKGROUND AND CONTEXT

2.1 Regulatory precedent

Ofgem currently uses a rolling average mechanism to set a cost of debt allowance for regulated networks. The allowance is updated annually.

For GD1/T1, the rolling average debt mechanism has the following properties:

- A 10-year simple average;
- Of the iBoxx indices for GBP Non-Financials of 10+ years maturity, with broad A and broad BBB credit ratings;
- Adjusted to a real basis using 10-year breakeven RPI inflation;
- With no further adjustment for issuance costs of any kind, and no adjustment for any inflation risk premium.

For ED1, Ofgem's analysis of different potential roller designs under a range of possible different interest rate cases found that there was material scope for under-recovery of historical debt costs if the 10-year roller were to be adopted, but that this risk would be largely eliminated if Ofgem were to adopt a 10 to 20-year trombone average.[1] Ofgem therefore adopted the 10-20-year trombone average for ED1. The mechanism shares the remaining properties as the GD1/T1 mechanism as mentioned above.

ANNEX B contains a more detailed summary of the relevant regulatory precedent and background information on the development and decisions made in the RIIO framework regarding the cost of debt allowance mechanism.

2.2 Consultations to date within RIIO2

In March 2018 Ofgem began its consultation on the framework for the RIIO-2 price controls,[2] in which Ofgem stated that its indexation approach to setting the cost of debt allowance for RIIO-1 had worked well by reducing forecasting errors, thereby creating significant savings for customers.[3]

Ofgem also concluded in the March 2018 consultation paper that there may be scope to improve on its RIIO-1 approach to setting the cost of debt allowance. Ofgem put forward three options for consideration:

- **Option A: Recalibrate the RIIO-1 indexation approach**;
- **Option B: Set a separate allowance for existing debt plus indexation for new debt; and**
- **Option C: Allow full pass-through of the cost of debt.**

1 Ibid. Paragraph 2.37 to 2.45, including Figure 2.1.

2 Ofgem, RIIO-2 Framework Consultation, March 2018. https://www.ofgem.gov.uk/system/files/docs/2018/03/riio2_march_consultation_document_final_v1.pdf

3 Ibid. Paragraph 7.6.

Ofgem further refined its options in the July Methodology Decision document and the December Sector Consultation document.

We note that Ofgem currently still does not provide a definitive direction. It does however present a slightly clearer picture of how it presently contemplates setting the cost of debt allowance, even if it stops short of taking decisions at this time.[4] Ofgem's discussion focused on:

- **Partial indexation**: In its latest paper Ofgem refers to Option B, as described above, as partial indexation.[5] It noted the potential benefits as well as downsides of this option, and concluded that it is currently minded to discard Option B.
- **Option C**: Ofgem has ruled out option C due to its concerns of potentially unattractive incentives properties.
- **Sharing cost of debt outperformance**: Ofgem has signalled that it is not minded to move to a system of cost of debt performance sharing despite noting the potential for this to improve company credit metrics.
- **CPIH-based allowances**: Ofgem has noted the need for it to change its approach to deriving real allowances, given that it is unaware of a reliable market-based measure of breakeven CPIH inflation. Ofgem will consider two options, i.e. to deflate by implied breakeven RPI and to add a wedge, or to deflate using OBR forecasts of CPI.[6]

Ofgem has reiterated its view that it would need to see strong evidence for it to change its existing approach.[7] This appears to imply that it will continue to base its cost of debt allowances at GD2 and T2 on the sector average cost of debt. In respect of partial indexation and outperformance sharing, it has signalled that its current minded to position is not to adopt either, unless compelling evidence is presented in responses to the December consultation.

ANNEX B explores in further details the relevant discussions around the various options.

2.3 Ofgem's potential approaches

Based on the discussion above Ofgem will most likely implement a policy based on Option A or Option B from its March paper. Unless submissions to its December consultation present new evidence, it seems likely at this stage to prefer Option A. Ofgem has not so far signalled an interest in considering other potential approaches, although of course it may choose to do so at a future stage.

[4] Ofgem, RIIO-2 Sector Specific Methodology Annex: Finance, December 2018. https://www.ofgem.gov.uk/system/files/docs/2018/12/riio-2_finance_annex.pdf

[5] Ibid . Paragraph 2.3.

[6] Ibid. Paragraph 2.14.

[7] Ibid. Paragraph 2.19

It is presently not entirely clear whether in calibrating those options Ofgem will target a sector average allowance or a company specific allowance, although the signal from the December paper is that it seems likely to prefer a sector average.[8]

Ofgem's Option A is a continuation of well understood existing practice. Option B would be a new policy.[9] Here the allowance for cost of debt would be split in two, one part to allow for existing debts that are known and observable and a second to allow in expectation for new debt.

Ofgem has provided a high level indication of how it might choose to implement Option B.[10] This outline appears to be broadly in line with the approach that Ofwat has stated it intends to apply in PR19.

In respect of both Option A and Option B, Ofgem has noted a wide range of potential levers that it may consider when calibrating the design of these rollers. These include:

- In case of a roller, the length (averaging period) of the roller;
- in case of a trombone, the start and end lengths of the trombone;
- the weighting within the averaging period, e.g. whether to use RAV rather than a simple average;
- any potential halo which is related to Ofgem's views on;
  - whether the A or BBB (or some average) iBoxx is most appropriate;
  - whether to allow for transaction costs including issuance, liquidity management and cash carrying costs;
- the maturity of the chosen reference iBoxx series;
- the time horizon of any inflation adjustment if breakeven inflation rates are used;
- how to convert from nominal to real (CPI) in the absence of breakeven CPI;
- the potential sensitivity of outcomes to future market rate changes; and
- company specific factors, including refinancing profiles, differences in RAV growth.

As a matter of the mechanics of how Ofgem implements its policy decision, there are therefore a multitude of potential options available. However, in practice Ofgem's exact decisions in each of these areas may not have a material impact. If it is Ofgem's policy intent to set a common sector allowance that facilitates the recovery of sector average debt costs, there are clearly very many ways that it could use the levers described above to give effect to that policy. However, all of them could be expected to deliver broadly that outcome.

[8] It remains possible that Ofgem will choose to set an industry average cost of debt allowance, with all network businesses receiving a common allowance. However, we consider this unlikely, as the financing histories of each network sector are different, reflecting the timing of their privatisation and restructuring.

[9] As noted above, this policy would be new in the sense that while Ofwat has signalled its intention to adopt this approach, it has not yet executed it.

[10] Ofgem, RIIO-2 Sector Specific Methodology Annex: Finance, December 2018. Paragraph 2.6.

For similar reasons, we also note that in practice there may be little difference between the allowances that would emerge from Ofgem's Option A and Option B if they were adopted. For example, if in both cases Ofgem would calibrate its mechanism such that in expectation it allowed a sector average cost of debt, then whether it does this mechanically using one single allowance for all debt, or two allowances for embedded and new debt, the overall effect should be similar, i.e. to allow all companies average sector debt costs in expectation within some margin of error.

However, if the outturn market interest rate development turns out to be extreme and significantly different from the central case in expectation, then the results from Option A and Option B can be different for individual companies.

3 KEY POLICY QUESTIONS FOR GD2

3.1 Cadent's refinancing cost

One of the areas that makes the cost of debt allowance for GD2 particularly challenging is the existence of a significant outlier, namely Cadent. The outlier issue is amplified by the fact that there are in total only four companies in the sector and Cadent is by far the largest company of the four. If measured on a weighted average, Cadent's debt cost would account for just under a half of the entire GD sector.

Cadent is an outlier following the recent transaction in 2017, where a majority shareholding in the company that holds four GDN licences were sold. As a part of the sale preparation of these licences, National Grid undertook a significant restructuring of its debt book, including refinancing and buying back some high coupon historic debt. As a result, Cadent now has a debt book consisting of almost entirely new debt with a cost of debt level significantly lower than a more typical energy network operator. Figure 1 below demonstrates the extent to which Cadent's average cost of debt is below the rest of the sector.

Figure 1 GD sector current cost of debt (real CPIH)

Company	Average cost of debt
NGN	2.05%
WWU	2.64%
SGN	2.29%
Cadent	0.56%

Source: Company debt books taken from latest regulatory accounts.

Note: CPIH assumption 2.04% used to convert nominal debt, in line with Ofgem's assumption.

In principle, if funding the sector average is the policy objective that Ofgem aims to pursue, it could be argued that any outlier should not necessarily be a concern as winners and losers in a sector-wide allowance regime are bound to exist as a natural feature of the policy.

However, since this outlier was created at a specific point in time through re-structuring and buy-backs where the investors would have incurred upfront capital cost, it is less clear if the resulting new debt book can be considered an appropriate efficient benchmark. Had this transaction never taken place, these licences would still be holding their old debts, broadly in line with the rest of the sector. It could therefore be argued that the new debt book cannot be used when deriving the sector average without adjustment.

A direct consequence of benchmarking the sector average including Cadent's current debt book without any adjustment would be an allowance level that is too low for the entire sector as a whole (arguably including Cadent if the additional capital investment for the restructuring is to be taken into account). Doing so would lead to a failure of Ofgem's financing duty which states that *'efficient network companies should be able to secure financing in a timely way and at a reasonable*

cost in order to facilitate the delivery of their regulatory obligations'[11], and would be inconsistent with Ofgem's policy to fund the sector average.

In practice, Ofgem has various different ways to try to control for this, for example:

- Ofgem could gather information on Cadent's old debt book prior to any restructuring, and use its own assumptions on how the debt book would have evolved in the past two years absent of the transaction;
- Ofgem could gather information on the cost of re-financing the old debt as part of the transaction, and treat that capital cost as additional cost of debt using some form of amortised/annuitized schedule (we understand that Ofgem is currently considering this option); or
- Ofgem could simply ignore the entire Cadent's debt book, and use the other three companies to calculate the sector average.

In principle the first two methods should result in similar outcome. The effect of all three should be considered by Ofgem.

We do not have the necessary information to explore the first two options, although we note that annuitizing the reported £833m financing cost into a reasonable maturity period (say 20 years) using a contemporaneous market discount rate (say iBoxx index yield of 3.16% as of 31st March 2017) would result in an upward adjustment of roughly 1 percentage point on Cadent's average cost of debt for the GD2 period (equivalent of £57m per year). This would bring Cadent's cost of debt in line with the rest of the sector.

In the modelling exercise of this report, therefore, we focus only on the third option, which is to take the sector average excluding Cadent's debt book.

3.2 Sharing factor

As explained above, Ofgem has indicated that it has considered options for sharing under/outperformance between companies and consumers, although the present indication from the December paper is that it is not minded to do so. Notwithstanding this, Ofgem could overlay any of its possible future cost of debt allowance models with a sharing mechanism, where some fixed proportion (between 0% and 100%) of under/outperformance is shared with customers.

Ofgem has noted that a proposal for performance sharing may be difficult to implement in practice, as it would require Ofgem to collect data on actual debt costs on a routine basis from the sector. In this regard, we understand that such information has recently been collected from the companies by Ofgem as part of its Regulatory Financial Performance Reporting work.[12] Ofgem may therefore become more comfortable with the practical data and work required to implement performance sharing in future.

[11] RIIO Handbook, paragraph 12.1.

[12] For more information, see here: https://www.ofgem.gov.uk/publications-and-updates/request-information-riio-financial-performance.

Whether or not Ofgem actually adopts a sharing factor will depend to some extent on whether Ofgem considers that it can overcome satisfactorily the practical and incentive challenges it noted in its December paper associated with that approach.

3.3 Inflation

Ofgem has stated that it is its intention to move from indexing RAV and allowed revenues by RPI to CPIH.[13] It intends to undertake further work in a number of areas in this regard, including whether:

- phasing the transition is appropriate;
- CPIH remains the ONS's lead measure of inflation;
- there is a suitable historical data set to support a price control; and
- a market for CPIH-linked financial assets may emerge.[14]

If Ofgem changes its approach to inflation accounting for the generality of the price control, there would need to be consequential changes in its approach to setting cost of debt allowances. As discussed above, at present nominal iBoxx data is converted onto an RPI-real basis using daily Bank of England implied breakeven 10-year inflation. If CPIH is to be used instead of RPI, then it would be necessary to instead convert nominal rates to a CPIH-real basis.

Ofgem would need to consider how to make this conversion in practice for both historical data that would remain in the roller for some time and new data going forward. The existing approach of using implied breakeven inflation could not be adopted at present as there is currently no Bank of England implied breakeven series for CPIH.

In its December consultation, Ofgem explained broadly two options:

- Ofgem could switch to using a forward looking CPIH forecast to convert any nominal rates into CPIH, and more specifically Ofgem proposed to use 2.04% for all rates since 2018 and 2.0% for all rates prior to 2018.
- Alternatively, Ofgem could retain the use of the break-even RPI inflation as currently used, but adjust it with a wedge (currently proposed at 1.009%).

In relation to the second option, we note that Ofgem used a 10-year break-even inflation in RIIO1. However, given that RIIO2 will be only five years, it is questionable if a 10-year break-even inflation would still be appropriate as forward-looking inflation assumption.

In our analysis, we have used the first option to calculate the CPIH real cost of debt.

3.4 Derivatives

A further complexity is the extent to which companies make use of financial derivatives. Derivatives can be used to hedge inflation risk or underlying base-rate risk. Some derivatives can have the effect of restructuring the underlying debt

[13] Ofgem, RIIO-2 Framework Decision, July 2018. Paragraphs 6.95 and 6.96.

[14] Ibid. Paragraphs 6.102 and 6.103.

instrument (e.g. reprofiling of the cost over time). Restructuring of this kind could affect the industry average or company-specific cost of debt and any measured under/outperformance that is potentially shared with consumers.

It is our understanding that Ofgem has not hitherto included within its analysis of cost of debt allowances any treatment of derivatives, preferring to focus attention on more traditional forms of debt financing. It is possible that Ofgem may change its view on this approach and allow derivatives to play some role. However, Ofgem has not, to date, made any clear statements in this regard.

It has not been possible for us to analyse the potential effect of Ofgem including derivatives within the scope of its cost of debt allowances, as information on derivatives entered into by private companies is not routinely collected and made available in the public domain. As a result, the base case scenarios considered in our analysis reflect GDNs' cost of debt excluding the effect of derivatives.

However, NGN has informed us that the ENA has commissioned a study from NERA that investigated the effect of derivatives on companies' cost of debt for RIIO2. We understand from NGN that when taken at the sector average over GD2, derivatives have the effect of increasing the sector average cost of debt by around 0.35%. We show the effect of this potential adjustment in one of the sensitivity scenarios.

4 MODELLING OFGEM'S POLICY OPTIONS

4.1 Our approach

We have considered a range of future cost of debt allowance options, consistent with our review of Ofgem potential policy options explored in detail in section 2.3. We use a model of present and future sector debt costs to explore quantitatively the effect of each option.

Our analysis shows:

- the difference in outcomes between the options, compared to the sector average (without Cadent);
- the potential sensitivity of these options with regard to different future interest rate scenarios; and
- a number of other sensitivity scenarios, such as companies struggling to achieve the assumed credit rating and the effect of derivatives based on third party analysis (informed by NGN).

This indicative modelling does not seek to identify with any sense of certainty the exact mechanics that Ofgem should apply in GD2 or beyond to set cost of debt allowances. The details of precisely how Ofgem may construct future cost of debt allowance mechanisms will be governed by the policy choices outlined above and also by the company and market data that Ofgem has before it at the time those design decisions are taken.

We focus our analysis primarily on the GD2 period (as this is the period for which we have most guidance from Ofgem on its future approach).

The policy options that we have evaluated are summarised in Figure 2.

Figure 2 Cost of debt policy options we explore

Option	Description
GD1 approach	Retain a simple 10-year roller (assumes 10% of the companies' debt portfolio is refinanced each year).
Option A	Re-calibrate RIIO-1 approach to target an allowance close to the sector weighted (by actual amount of debt) average cost of debt (excluding Cadent).
Option B	Loosely reflecting the Ofwat approach: □ Measure the value-weighted average coupon of outstanding debt in the whole sector (excluding Cadent) at the start of the price control and fix this rate for the entire price control period. □ Index the cost of new debt in each year as a 1-5 year trombone average on the iBoxx. □ Finally, the total cost of debt is computed as the weighted average between the embedded debt and new debt, with the weight on the new debt transitioning from 0% at the start to 40% at the end of the price control. So 8% of debt book is new debt by the end of year 1, and 16% by the end of year 2, etc. We note Ofwat's proposal at PR19 assumes 60% at the end of the period.

Source: Frontier analysis

The first option we consider is the status quo arrangement. Otherwise, we explore options that cover Ofgem's key decisions (notwithstanding the signal from Ofgem in its December paper that it is presently minded to favour the retention of a sector-wide allowance delivered through an Option A roller), namely, whether to have a single roller covering existing and new debt, or whether to adopt a mechanism that allows for each separately.

As noted above, we use our modelling work to identify candidate roller designs that would be consistent with these policy options (and to eliminate from further consideration roller designs that would not satisfy these policy objectives).

4.2 High level model description

We have developed a model that projects the cost of debt of all GDNs into the future, starting from their current debt books. The analysis takes into account the size and time to maturity of each existing debt instrument. The inventory of existing debt is based on the most recently published regulatory accounts for each licensee.

We make assumptions on RAV growth and target gearing. The model uses these assumptions to project the raising of new debt in each year to ensure that the target level of gearing is achieved. The quantum of finance raised takes account of the need to refinance debt that matures, plus new issuance to cover RAV growth.

All new debts issued are presumed to be issued at a benchmark rate (based on the iBoxx indices chosen by Ofgem in RIIO1). Our assumed cost of new finance

in each year is based on future gilt yields (which in our central case is based on the forward yield curve) plus an uplift based on the historical spread between gilts and iBoxx. Given the current proposed tough allowed return for RIIO2, we question the assumption that all GDNs would be able to issue debt at the average of A and BBB iBoxx rates, in line with Ofgem's assumption (and its likely allowance). We therefore also run a sensitivity analysis where GDNs issue at BBB iBoxx rates.

The model allows for different tenors of debt and a choice between nominal fixed and index-linked debt when raising new finance, although investigation of the effect of varying these assumptions does not suggest material differences would result.

All the results shown in this report are based on the assumption that new debt financings are in the form of 20-year fixed nominal coupon bonds.

A fuller description of our model can be found in Annex B.

The result of our analysis is a reasonable and plausible (albeit not precise) projection of the cost of debt for each individual GDN and the sector as a whole for the GD2 period. We emphasise that the projections of the cost of debt that result from our modelling should not be interpreted in any sense as optimised. Rather they derive from a relatively simple set of refinancing rules applied to existing debt books, to illustrate the possible path of future sector debt costs. In reality, companies' refinancing decisions will be more lumpy than is suggested in the model, due to efficiency reasons (e.g. companies typically do not raise bonds every year in reality).

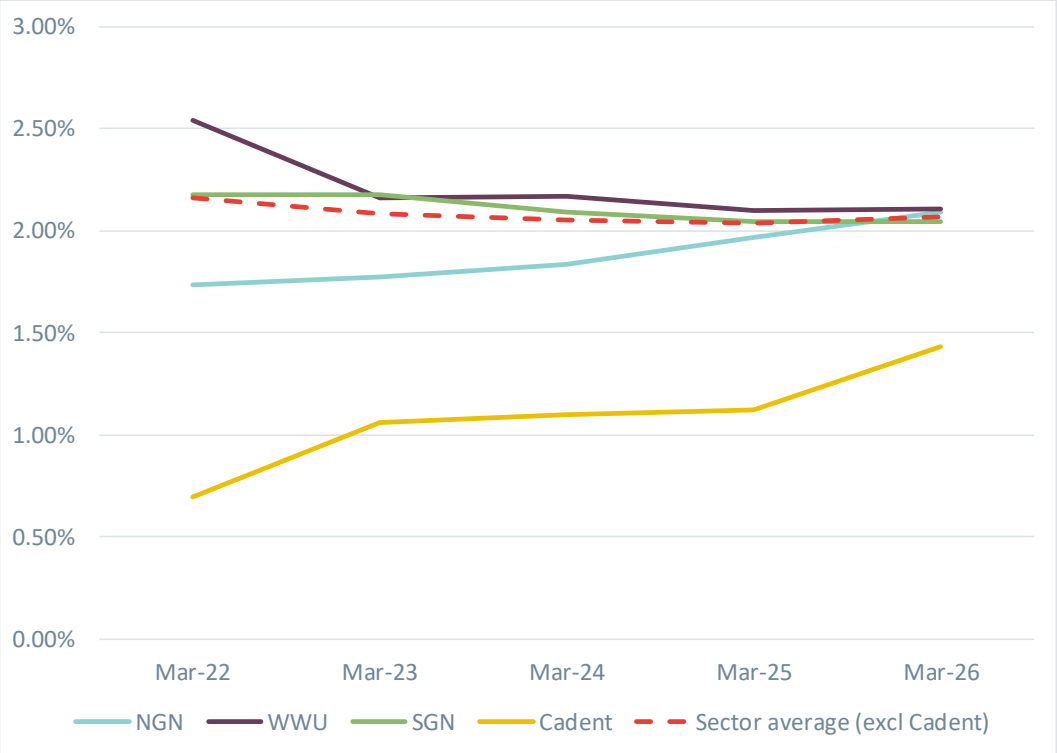
4.3 Modelling results

We begin by setting out projected debt costs for the sector.

4.3.1 Projected sector debt costs

The outputs from our model are illustrated in Figure 3 and in further charts below.

Figure 3 Projected cost of debt during GD2 (in CPIH real terms)



Source: *GDN debt books from latest regulatory accounts*

Note: *Key assumptions: Forward interest rates implied from spot yield curve as of 31 Oct 2018, published by the Bank of England, target gearing of 60%, CPIH-real RAV growth 2%, iBoxx spread over ten-year Gilt equal to past ten years average, future CPIH inflation assumed to be 2.04%.*

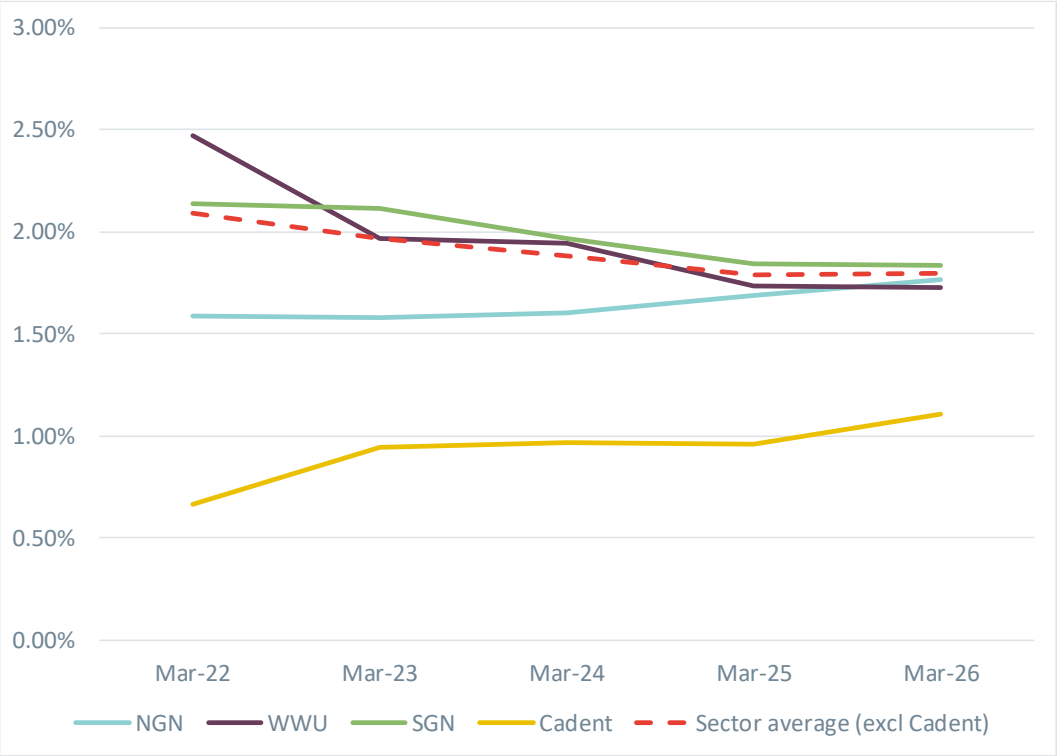
Based on our modelling assumptions, the sector average cost of debt (excluding Cadent) in CPIH real terms (dashed line) starts roughly around 2.2% and converges towards 2% through the GD2 period. The line showing Cadent reflects Cadent's cost of debt without the necessary adjustment as explained in section 3.1.

There is uncertainty over the future evolution of interest rates and yields on future utility debt issuance. We have aimed to illustrate the effect of this uncertainty using a range of cases. In addition to the central case described above, we have also constructed two sensitivities cases on the future interest rate movement.

- **Low interest rate case**: the gilt rate is assumed to stay constant at the 2018 average level of 1.43% (as at the time of writing), throughout the entire forecasting period.
- **High interest rate case:** the gilt rate is assumed to rise sharply in 2019 by 2% from the current 2018 average level to 3.43%, and then to remain constant throughout the remainder of the forecasting period. We note that this case could be considered less likely than the low interest rate case, although with the current political and economic environment it is not implausible and it would be reasonable to use as a stress test.

Figure 4 and Figure 5 below illustrate the outcome of our two interest rate sensitivity cases in comparison with the central case.

Figure 4 Projected cost of debt during GD2 (in CPIH real terms) – low interest rate case

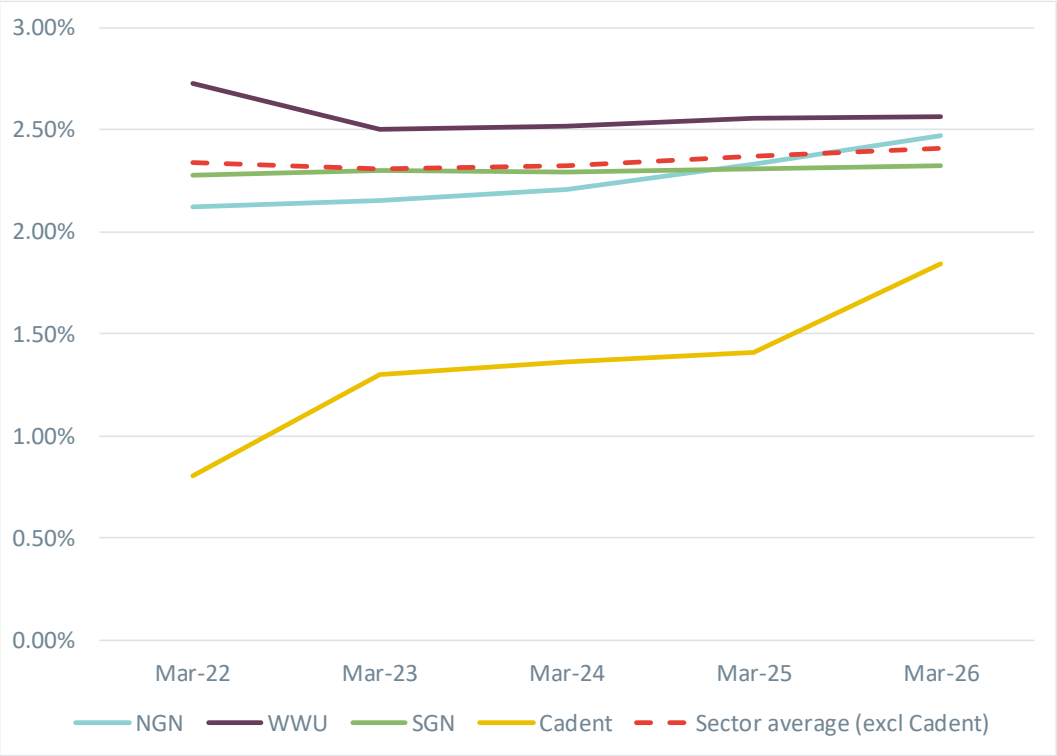


Source: *GDN debt books from regulatory accounts*

Note: *Gilt yield assumed to stay constant at the current 2018 average level of 1.43%, throughout the entire forecast period; all other assumptions as per the central case.*

In the low interest rate environment, where the interest rates are assumed to stay flat throughout and beyond the period of GD2, the sector average real cost of debt could fall well below 2.0% shown in the central case.

Figure 5 Projected cost of debt during GD2 (in CPIH real terms) – high interest rate case



Source: *GDN debt books from regulatory accounts*

Note: *Gilt yield is assumed to suddenly rise by 2% in 2019 from the current 2018 average level of 1.43%, throughout the entire forecast period; all other assumptions as per the central case.*

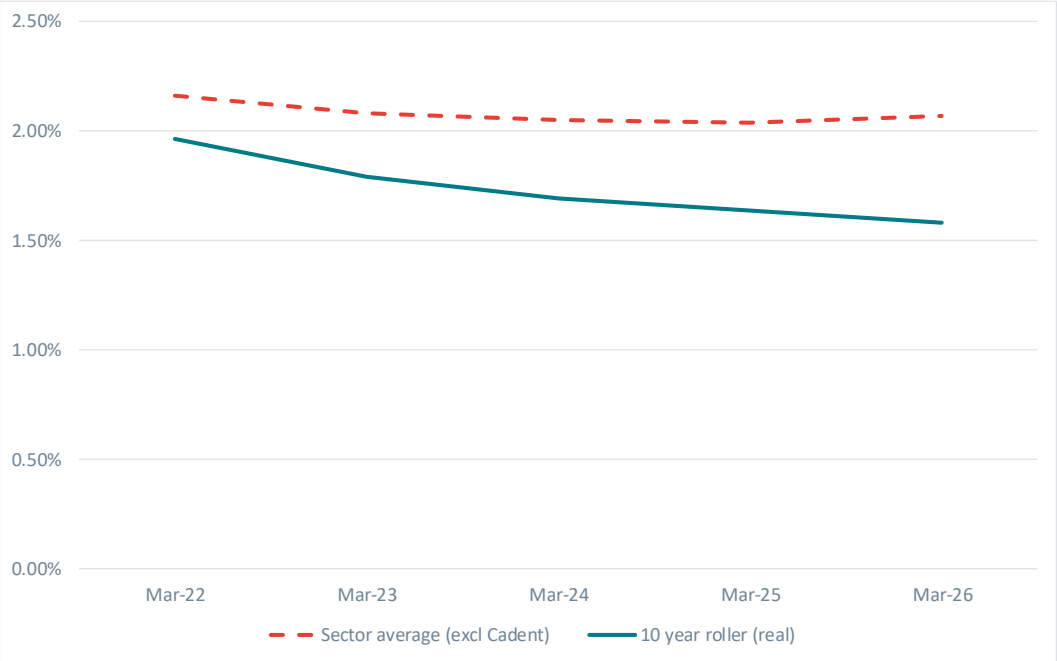
In the high interest rate case, the real cost of debt in the sector could be well above 2% throughout the GD2 period.

4.3.2 Modelling result for different roller designs

RIIO-GD1 10-year roller

We start our review of potential options for regulatory debt allowances by looking at the status quo currently being used in GD1, the 10-year roller, compared with the sector average (excluding Cadent). This is shown in Figure 6.

Figure 6 RIIO GD1 10-year roller (in CPIH real terms) – central interest rate case



Source: iBoxx indices downloaded from Markit, Frontier analysis

Note: Forward interest rates implied from spot yield curve published by the Bank of England

It can be seen from the chart above that, under our modelling assumptions, the 10-year roller would likely under-compensate the GD sector on average (excluding Cadent). This is because the 10-year roller does not contain the pre-crisis period and therefore decreases markedly going into the GD2 period due to the sustained low interest rate in the market since 2012. All GDNs other than Cadent have legacy debt raised before the financial crisis with much higher coupons than the post-crisis market rates. A large volume of such legacy debt will last well past the GD2 period.

We have also carried out the same analysis under the two sensitivity cases on future interest rates. The same conclusion holds in both cases in that the 10-year roller would be unlikely to provide adequate funding for the sector average.

Option A: Full indexation, sector average

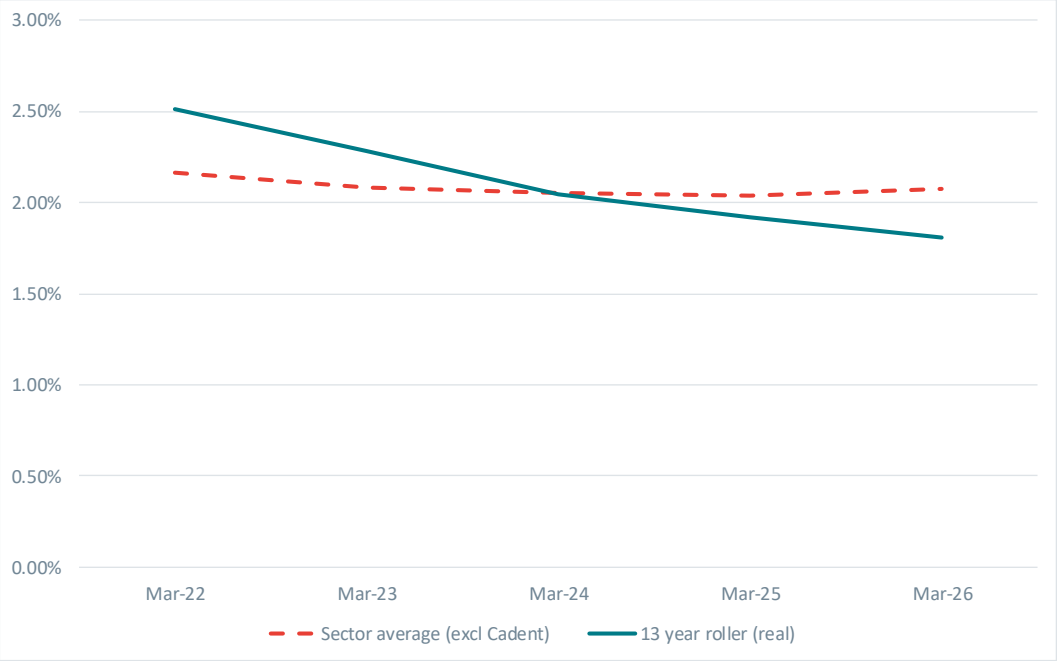
Under Option A we have explored a range of roller designs to identify the length of roller that is needed to compensate the average sector debt cost (excluding Cadent).

We have examined a wide range of averaging periods and find that both rollers and trombones can be designed under this option to suit the policy objectives, albeit with some potential upward or downward adjustment.[15]

[15] In theory, if the iBoxx 10+year indices have indeed the correct maturity to reflect the average maturity of network bonds, then a long-term steadily state roller could be close to the average maturity of the indices (for BBB this is currently around 18 years and for A this is around 24 years). But in reality, because Ofgem needs to take into account the actual debt cost of the companies, the length of the roller will diverge from this theoretical steady state, but will depend more on the historic evolution of the market rates.

First, we show that in the central interest rate case, a 13-year roller could fit the sector average reasonably well, on average, throughout the GD2 period, as shown in Figure 7.

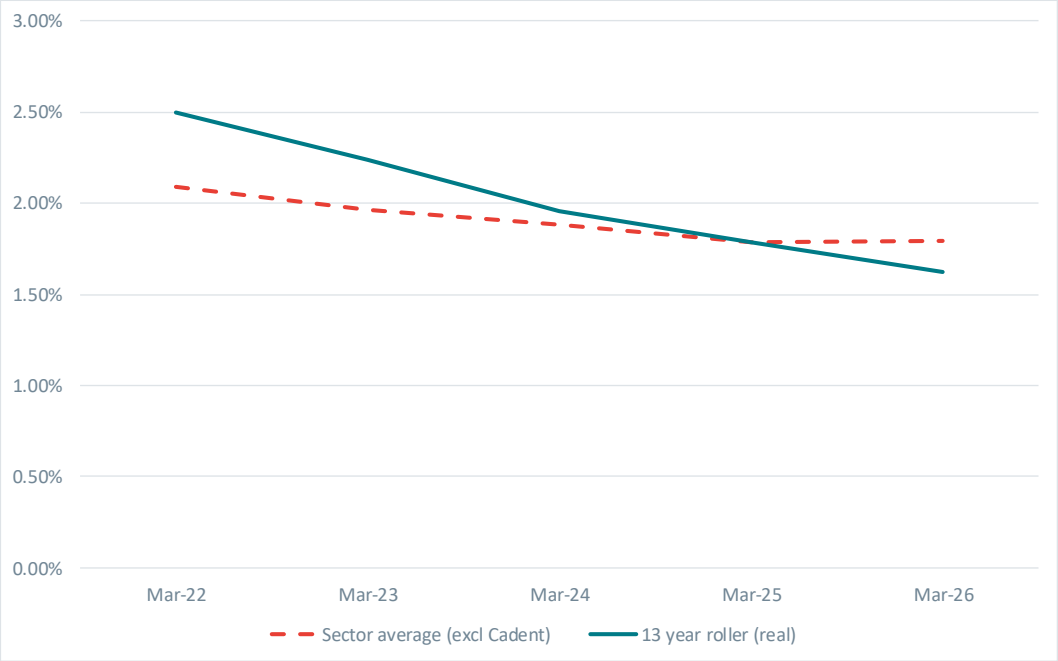
Figure 7 13-year roller (in CPIH real terms) – central interest rate case



Source: iBoxx indices downloaded from Markit, Frontier analysis
Note: Forward interest rates implied from spot yield curve published by the Bank of England

We note that the roller has a decreasing trend throughout the GD2 period, whereas the cost of debt of the companies appear to say relatively flat. This suggests that the roller would over-compensate in the early periods and under-compensate in the later ones. The exact profile may be prone to different interest rate assumptions as the profile of the roller allowance and company debt would be affected to a different degree by interest rate development. This is shown in the two interest rate sensitivity analysis below.

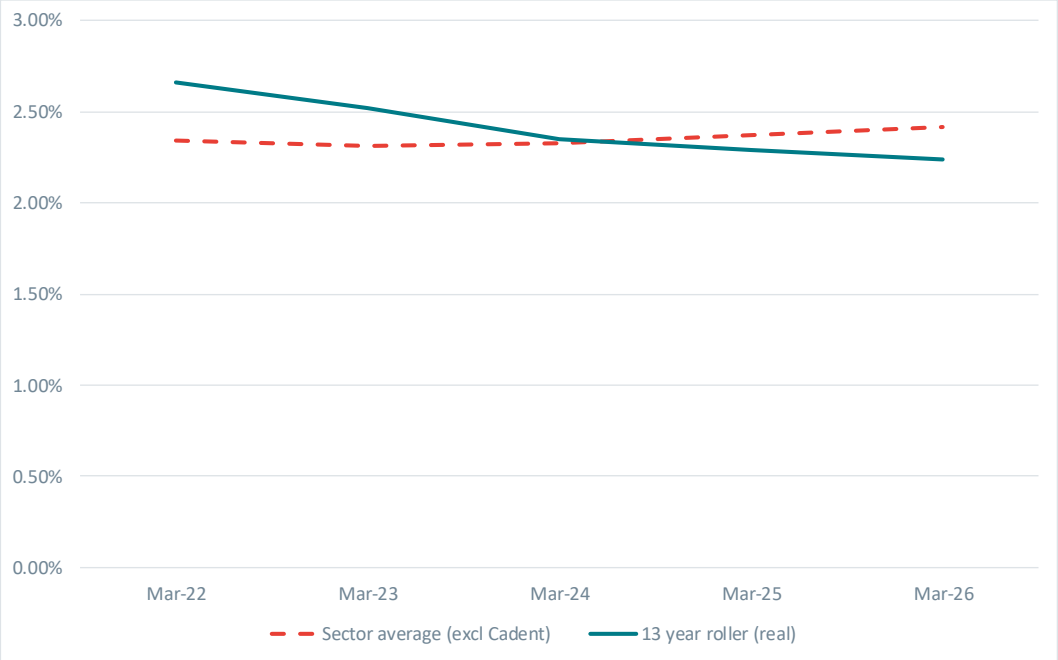
Figure 8 13-year roller (in CPIH real terms) – low interest rate case



Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Gilt yield assumed to stay constant at the current 2018 average level of 1.43%, throughout the entire forecast period; all other assumptions as per the central case.*

Figure 9 13-year roller (in CPIH real terms) – high interest rate case



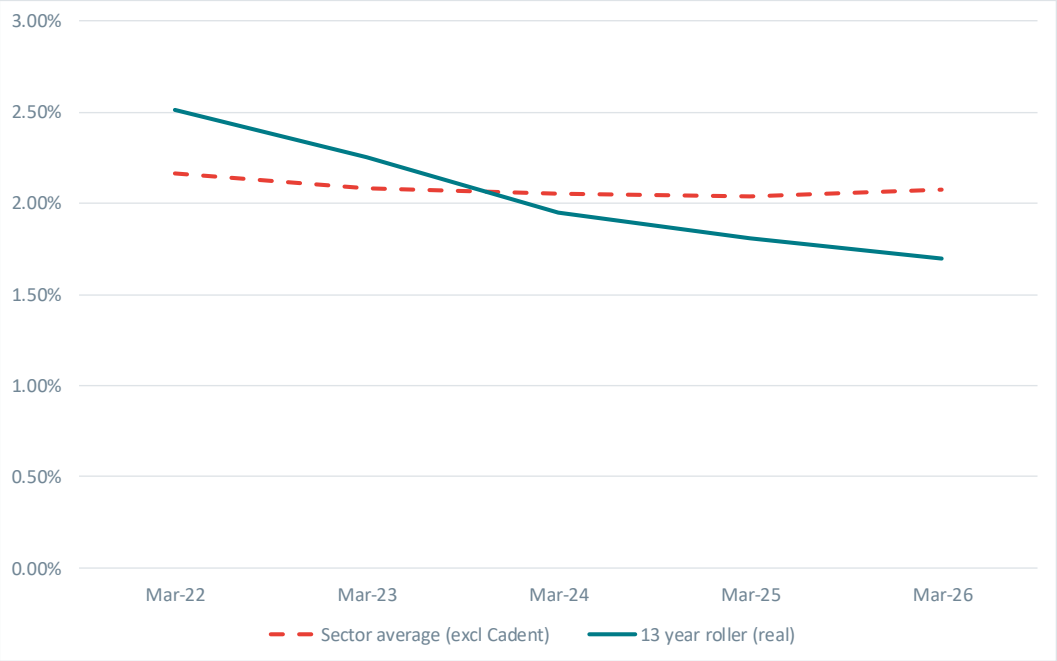
Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Gilt yield is assumed to suddenly rise by 2% in 2019 from the current 2018 average level of 1.43%, throughout the entire forecast period; all other assumptions as per the central case.*

As can be seen, depending on the interest rate scenarios, the number of periods that the roller could over-compensate and under-compensate varies. This could be considered a relatively unattractive property.

Additionally, we show a sensitivity scenario where GDNs only raise debt at BBB iBoxx rates, but Ofgem calibrates the indexation based on the average between A and BBB iBoxx indices.

Figure 10 13-year roller (in CPIH real terms) – GDNs raising debt at BBB rating



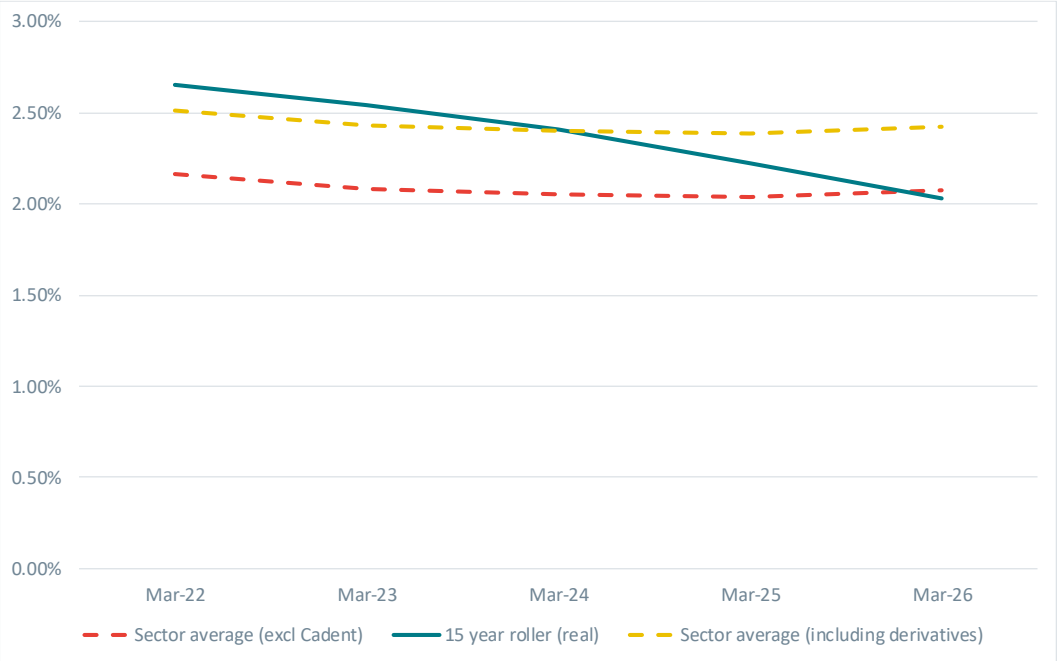
Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Forward interest rates implied from spot yield curve published by the Bank of England. GDN's assumed cost of new issuance equals iBoxx BBB index.*

The chart above shows that if GDNs are only able to raise new debt at BBB rating due to the current regulatory environment, then Ofgem would need to amend this 13-year roller in order for it to still compensate the sector average (excluding Cadent). For example, it could target the BBB iBoxx index or use a longer averaging period.

Finally, we refer to NGN's information on the effect of derivatives adding 0.35% to the average sector cost of debt, according to the NERA's study. Assuming that this finding is accurate and this effect is taken into account, our modelling suggests that if Ofgem chooses to take into account the effect of derivatives, at least a 15-year roller may be needed to fund the sector average, as shown in Figure 11 below.

Figure 11 15-year roller (in CPIH real terms) – with derivatives according to NERA study

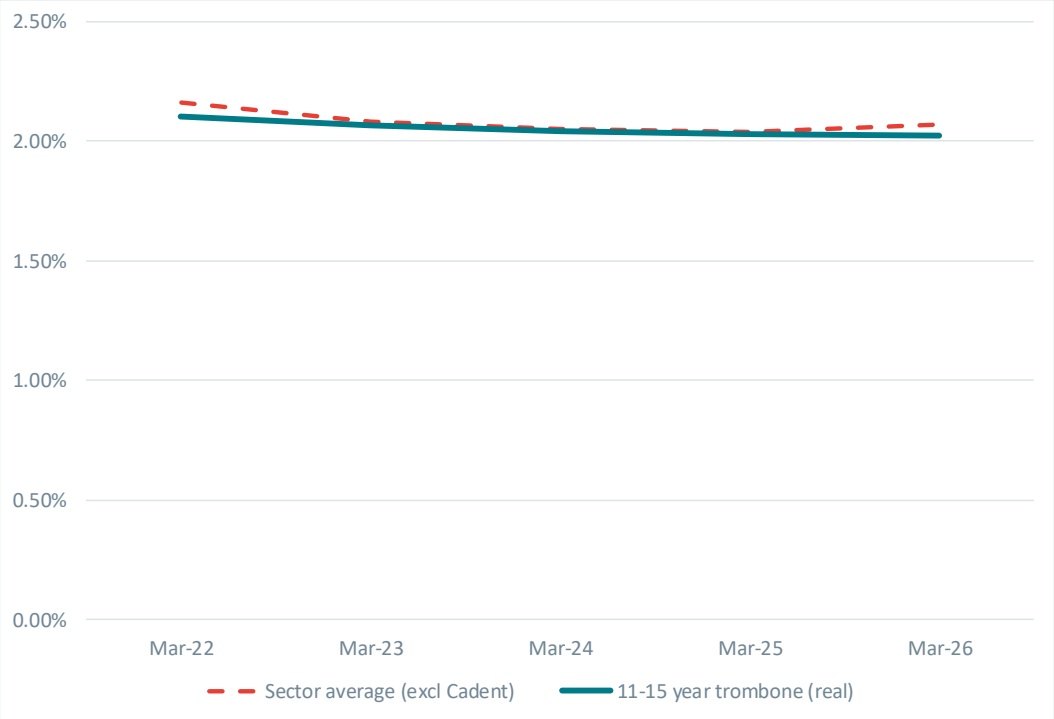


Source: *iBoxx indices downloaded from Markit, Frontier analysis, effect of derivatives at 0.35% according to the NERA study*

Note: *Forward interest rates implied from spot yield curve published by the Bank of England. GDN's assumed cost of new issuance equals iBoxx BBB index.*

Next, we show that in the central interest rate case, a 11-15 year trombone could fit the sector average reasonably well, shown in Figure 12 below.

Figure 12 11-15-year trombone (in CPIH real terms) – central interest rate case

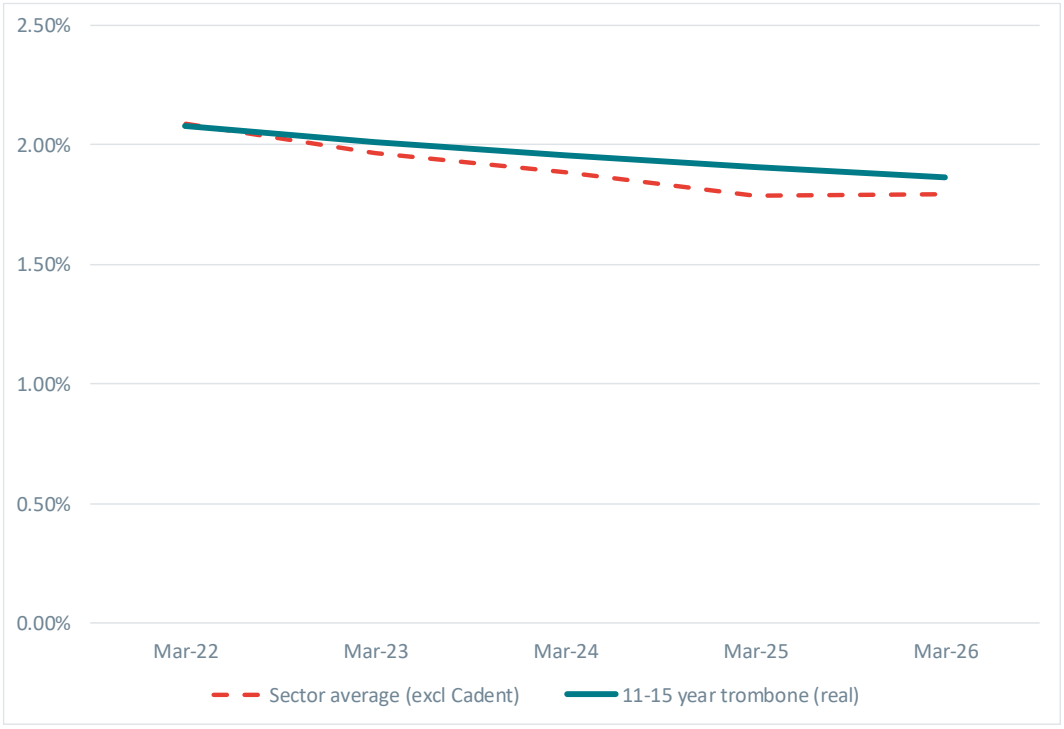


Source: iBoxx indices downloaded from Markit, Frontier analysis
Note: Forward interest rates implied from spot yield curve published by the Bank of England

We note that the trombone provides a much better match to the sector's average cost of debt, compared to the 13-year roller shown in Figure 7 above.

We also carry out the same analysis under the two sensitivity case on future interest rates.

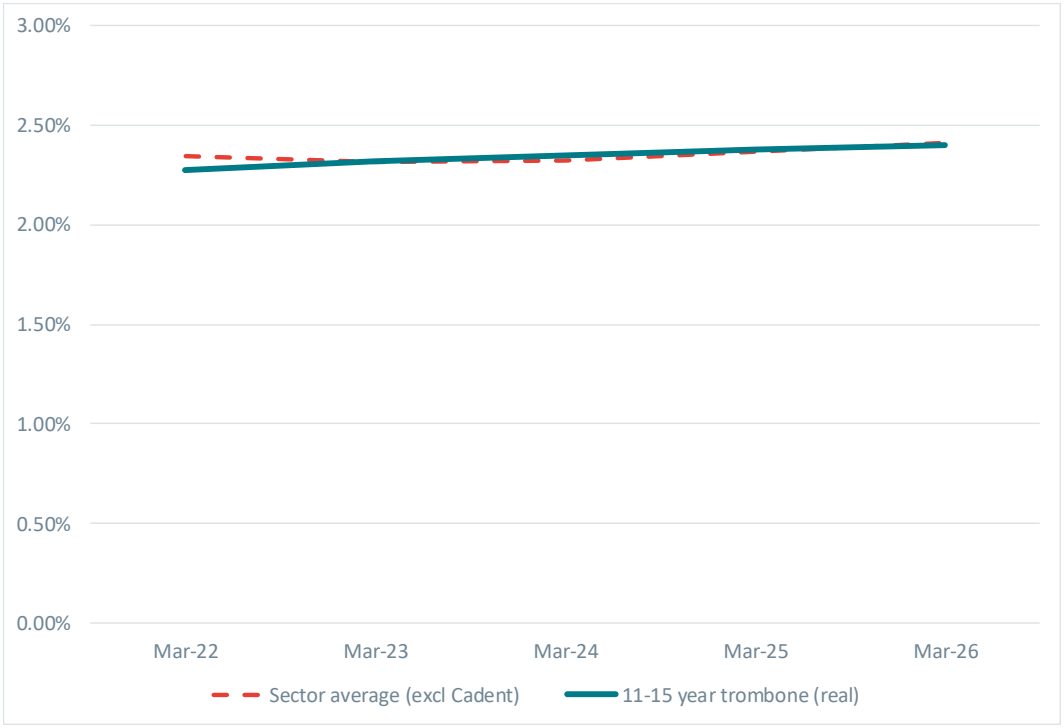
Figure 13 11-15-year trombone (in CPIH real terms) – low interest rate case



Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Gilt yield assumed to stay constant at the current 2018 average level of 1.43%, throughout the entire forecast period; all other assumptions as per the central case.*

Figure 14 11-15-year trombone (in CPIH real terms) – high interest rate case

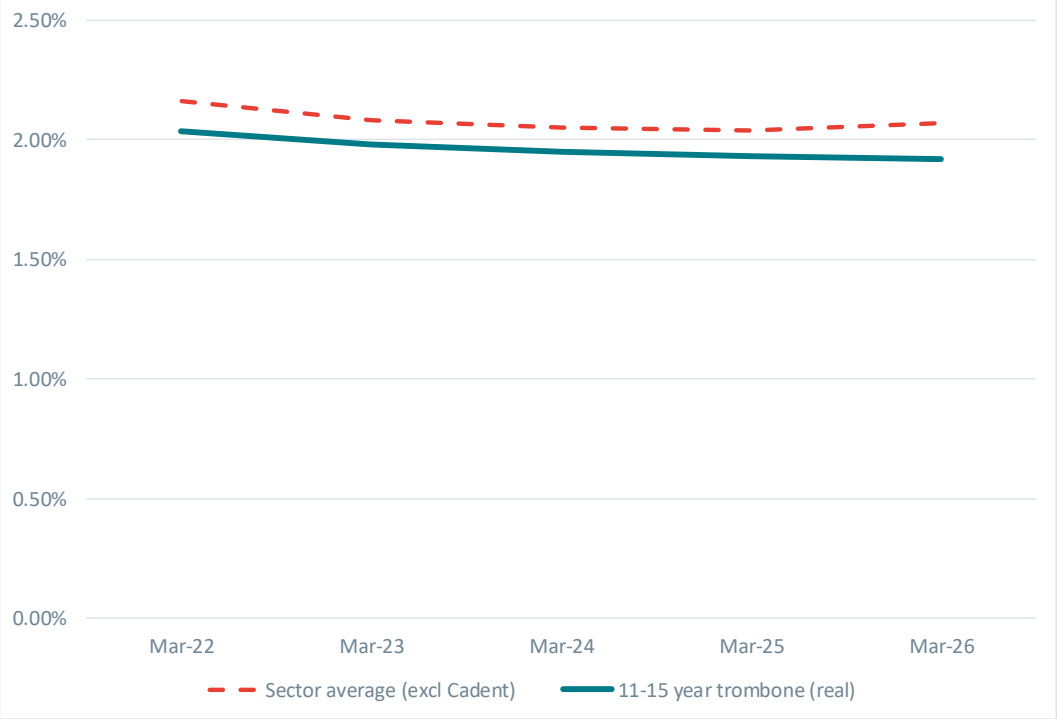


Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Gilt yield is assumed to suddenly rise by 2% in 2019 from the current 2018 average level of 1.43%, throughout the entire forecast period; all other assumptions as per the central case.*

Next, we show the sensitivity analysis where GDNs issue new debt at BBB rating during GD2.

Figure 15 11-15-year trombone (in CPIH real terms) – GDNs raising debt at BBB rating



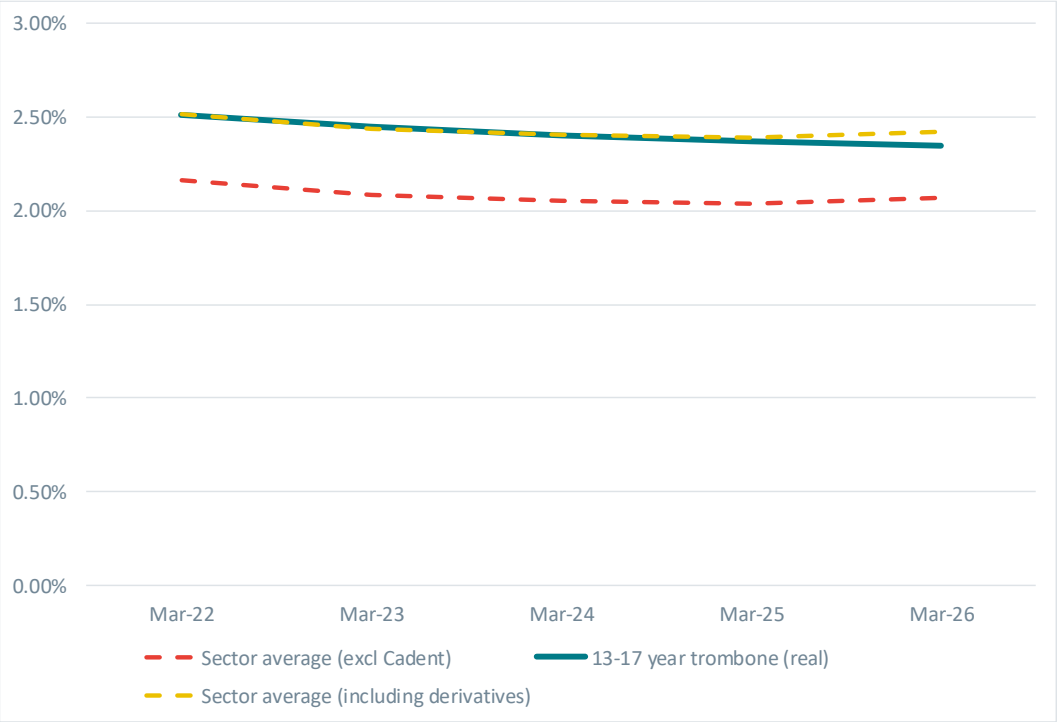
Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Forward interest rates implied from spot yield curve published by the Bank of England. GDN's assumed cost of new issuance equals iBoxx BBB index.*

With a mismatch between the assumed credit rating of the companies and the iBoxx indices used in the roller, the sector would be underfunded by about 0.2% on average. Ofgem could switch to a target BBB rating, or increase the starting length of the trombone average.

Again, we show the result with the effect of derivatives taken into account, assuming that the information provided on the effect of derivatives is accurate.

Figure 16 13-17 year trombone (in CPIH real terms) – with derivatives according to NERA study



Source: *iBoxx indices downloaded from Markit, Frontier analysis, effect of derivatives at 0.35% according to the NERA study*

Note: *Forward interest rates implied from spot yield curve published by the Bank of England. GDN's assumed cost of new issuance equals iBoxx BBB index.*

So if Ofgem chooses to take into account of the derivatives, a 13-17year trombone may be better suited to fund the sector average in GD-2.

In conclusion, the charts above show that, excluding the effect of derivatives, the 11-15 year trombone can track the sector average reasonably well in most interest rate cases, although there could be some discrepancy in the low interest case and in the BBB rating case. Overall, it fits the profile of the sector average better than the 13-year roller.

Based on the above observations, if Ofgem's overall objective is to fund the GD sector average, a trombone-style average mechanism may work better than a rolling average due to the current debt book of the sector and the maturity profile of the existing debt.

However, our analysis also indicates that the exact effect of the mechanism design could hinge on the interest rate movement in the future, something that Ofgem will have also considered in the design of its RIIO1 indexation mechanism.

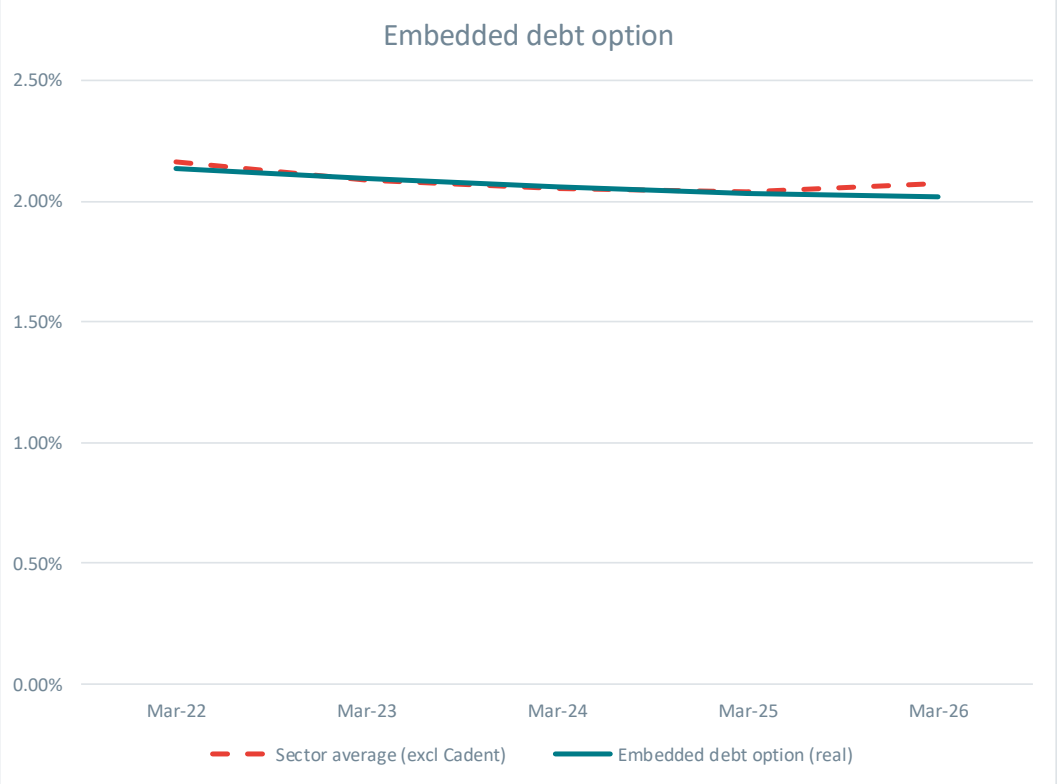
We assume that Ofgem would carry out such sensitivity tests when designing the exact mechanism for GD2, as it did when calibrating the cost of debt roller for RIIO1 mechanisms.

Option B: Partial indexation – sector-wide allowance

Under option B, the cost of debt allowance is split between embedded debt and new debt, and the embedded debt would be funded at the sector average level.

For the purposes of modelling, we have assumed that 8% of the existing debt book is refinanced annually, informed by our modelling results. This assumes that a company would start the price control period with 0% new debt, but would raise new debt equal to 8% of the existing debt book each year, such that at the end of the regulatory period, the total proportion of new debt is 40% of the total debt book. Figure 17 below shows our central interest rate case for Option B.

Figure 17 Embedded debt option (in CPIH real terms) – central interest rate case

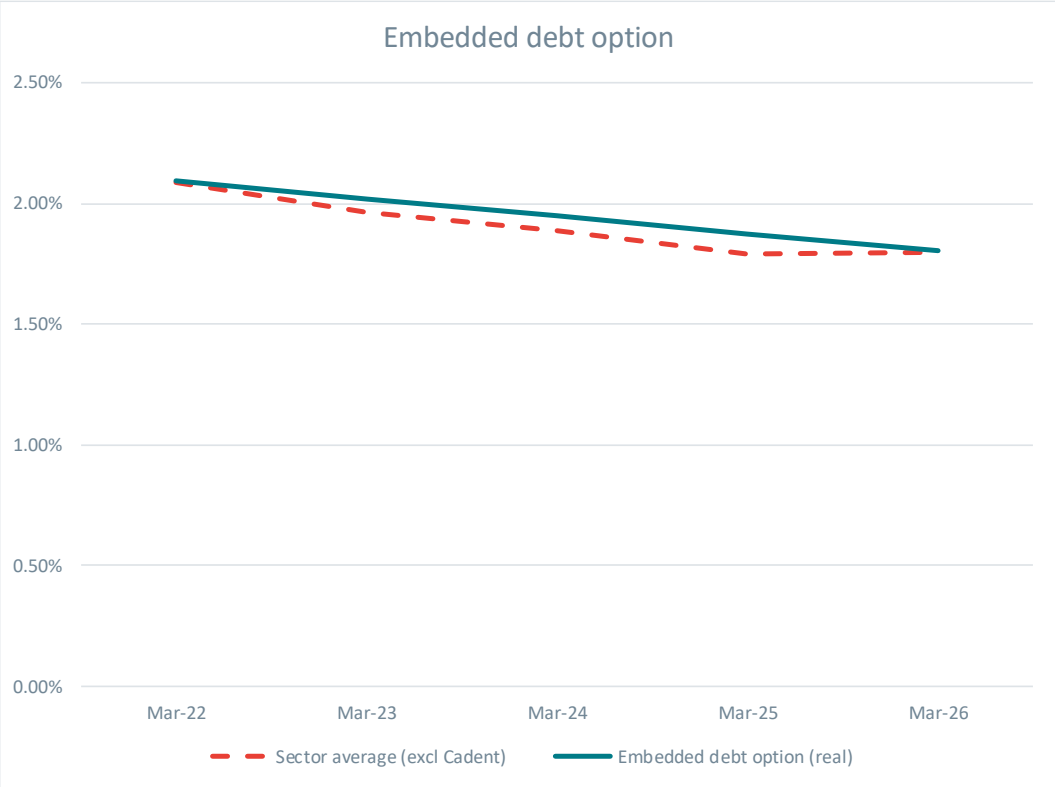


Source: *iBoxx indices downloaded from Markit, Frontier analysis*
Note: *Forward interest rates implied from spot yield curve published by the Bank of England*

Our calibration of Option B fits the projected sector average cost of debt closely, both in terms of shape and level.

We again carry out the interest rate stress test, as shown in Figure 18 and Figure 19 below.

Figure 18 Embedded debt option (in CPIH real terms) – low interest rate case



Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Underlying Gilt yield assumed stay constant at the current 2018 average level of 1.43%, throughout the entire forecast period.*

Figure 19 Embedded debt option (in CPIH real terms) – high interest rate case

Source: *iBoxx indices downloaded from Markit, Frontier analysis*

Note: *Underlying Gilt yield assumed to suddenly rise by 2% in 2019 from the current 2018 average level of 1.43%, throughout the entire forecast period*

The mechanism under option B allows for a relatively good fit of expected debt costs, even in the interest rate sensitivity cases. This may be because option B assumes a policy with two calibration instruments, one part that can be tailored to fit closely embedded debt costs that are known with certainty, while the second covers new debt costs in a way that is updated during the period and can therefore reflect future year-on-year changes in interest rates. In comparison, Option A uses a single mechanism to compensate both historical debt costs and future debt costs.

This is a potentially attractive property of partial indexation, as it provides an approach that would be more resilient to capital market volatility, thereby contributing to a more robust assessment of financeability and investor confidence.

We note, however, that for option B to be more resilient to interest movement it is crucial that the weighting between new and embedded debt is set correctly. If the weighting does not reflect reality, then option B can be more prone to interest rate movement than option A.

4.4 Concluding remarks

Our analysis has demonstrated that Ofgem has at its disposal the tools necessary to develop rolling-average indexation mechanisms (rollers) that can deliver on any of the potential policy objectives that it may select. In our analysis, we have not varied all of the possible calibration levers that Ofgem has highlighted in its

consultation so far, and yet we have been able to develop policy options that track reasonably closely the sector average cost of debt.

Practicality

We see no practical obstacles to Ofgem implementing policies consistent with the direction signalled by its consultation papers.

Our analysis provides an indication of the potential effect of different interest rate cases on outturn allowances.

Treatment of Cadent's debt costs

Our modelling analysis makes clear that one important policy choice in relation to the cost of debt approach for GD2, if Ofgem aims to fund the sector average with an indexation mechanism, is the treatment of Cadent's current debt book.

Our analysis shows that if Cadent's debt book is taken into the sector average without adjustment, this would under-estimate the true cost of debt of the sector by a large margin. As a result, the entire sector would be under funded in relation to the cost of debt. Doing so would imply a potential failure of Ofgem in discharging its financing duties.

If the current debt book of Cadent is appropriately adjusted, or discarded for the purpose of calculating the sector average, then it appears highly likely from our modelling that the current 10-year roller deployed in GD1 would not adequately fund the sector's cost of debt.

We have found a number of alternative designs from Ofgem's own proposed options that could address this issue. These include a 13-year roller, a 11-15-year trombone, or a partial indexation.

Credit rating and derivatives

Our modelling also shows sensitivity scenarios where GDNs only manage to raise debt at BBB rating and where the effect of derivatives is taken into account (results relying on NGN's information on the effect of derivatives). Our sensitivity analysis shows that the 13-year roller and 11-15-year trombone would underfund the sector average.

In addition, Ofgem may choose to take into account the effect of derivatives. Assuming the information on the impact of derivatives on sector's average cost of debt provided by NGN is accurate, the roller window would need to be increased to 15 years and the calibration of trombone would need to be adjusted to 13-17 years.

Interest rate volatility

Inevitably, the outturn results from any rolling mechanism will be sensitive to future interest rate evolution. Ofgem's policy in respect of the cost of debt is to design a rolling mechanism that covers future debt costs in expectation. Given uncertainty over future levels of interest rates and corporate debt costs, all such mechanisms may over or under compensate companies for future incurred debt costs.

As a matter of principle, exposure to interest rate forecast error can be minimised over time by matching Ofgem's roller design. For example, suppose Ofgem decides to use a 20-year roller. Then a GDN could match its actual cost of debt reasonably closely to the allowance by issuing staggered 20-year tenor debt, refinancing 5% of its debt book each year – irrespective of what happens to future interest rates (although we note that such a policy may be relatively costly for a smaller GDN that would then be raising relatively small sums annually).

Sensitivity to future interest rate forecast error will increase if:

- there is a high proportion of legacy debt issued with timing that does not match the roller selected by Ofgem; and/or
- GDNs raise future debt in a different annual proportion and/or timing assumed by the roller used by Ofgem.

However, once existing legacy debt has been retired, and as long as GDNs raise future debt finance consistent with the roller used by Ofgem, then there should be reduced over/under-compensation.

Our empirical modelling results suggest that the trombone average in Option A is largely resilient to interest rate uncertainty for the period of GD2. In addition, the partial indexation of option B is also relatively resilient to interest rate uncertainty, if the weighting between new and embedded debt matches the actual proportion. If Ofgem reconsidered these two options carefully, it may find strong attraction to them, particularly in a regulatory environment where there is pressure to ensure that outperformance is justified.

ANNEX A OVERVIEW OF OUR MODELLING APPROACH AND MODEL ASSUMPTIONS

This Annex provides a high-level overview of our cost of debt model. In particular, it explains the key mechanisms with which the model projects the cost of debt and potential Ofgem allowance forward into the future, and it sets out the key assumptions made.

The model makes projections on two separate elements:

- future debt costs for all GDNs (hence the sector average); and
- the iBoxx indices, which are the basis on which different scenarios of cost of debt allowance mechanisms can be designed.

A.1 Projection of GDN (sector) future cost of debt

- We use the latest published GDN regulatory accounts to input companies' existing debts, amounts outstanding, coupon rates, and expiration dates.
- We use Ofgem's published RAV assumption from the latest Price Control Financial Model for the remainder of GD1 for each company.
- We have taken a CPIH-real RAV growth assumption of 2%.
- With the information on future RAV, target gearing (60%), and the need for refinancing of existing debt, the model calculates the required new debt issuance each year for each company.
- We assume companies raise fixed coupon nominal bonds at market rate (our projected iBoxx rate) without any halo effect – see below on how this is projected.
- The assumed tenor is 20 years, although this can be changed as an input assumption.
- We project company-specific and whole sector cost of debt for each year of the valuation period. These are weighted average cost of all debt raised, with the outstanding amount of debt being the weight. In other words, the projected cost of debt of a company is the weighted average of the cost of all debt of that company, and the projected cost of debt of the sector is the weighted average cost of all debt in the sector.

A.2 Projection of iBoxx indices

- We project the average of the iBoxx indices for GBP A and BBB rated non-financials with 10+ years maturity, based on future interest rate expectations and an assumed spread.
- We derive our forward rates from the spot nominal yield curve provided by Bank of England dated on 31 October 2018.

- Our assumed spread is based on the historic spread between gilts and the iBoxx indices. This is currently assumed to be 1.9%
- We assume that interest rates follow gilts projections until they peak, but then remain flat (current curve implies an interest rate fall) thereafter.
- With this set of assumptions, we are able to reconcile our nominal iBoxx ten-year rolling average with Table 3 in Ofgem's December consultation.[16]
- We assume that the future LIBOR rates follow the same step ups as our projected gilt rates. This is needed because some of the companies' current debt instruments include LIBOR based floating loans.

[16] Ofgem consultation RIIO-2 Sector Specific Methodology Annex: Finance, 18 December 2018

ANNEX B REGULATORY PRECEDENT ON COST OF DEBT INDEXATION

Ofgem currently uses a rolling average mechanism to set a cost of debt allowance for regulated networks. The allowance is updated annually. In this annex we provide a review of the relevant precedent around Ofgem's approach to determining allowances for the cost of debt under the RIIO framework, and we summarise the consultation to date on this subject within RIIO2 framework.

In the RIIO Handbook[17], Ofgem explained that it planned to adopt a rolling cost of debt mechanism. The precise design of this mechanism was to be fixed at the time of the price control, leading to a method that could be applied annually to determine an updated annual allowance. Ofgem considered that this policy:

- signalled a regulatory commitment to remunerating efficiently incurred debt costs;[18] and
- through annual updating based on recent outturn market rates should provide comfort that new debt financed at efficient rates would be fully funded in future.[19]

Ofgem stated that it would evaluate the options around how it would actually set the roller as part of the then forthcoming round of price controls, noting that this would involve looking at the maturity of debt and the period of time covered by the roller averaging window.[20]

B.1 RIIO-GD1 and RIIO-T1

The first price controls executed by Ofgem under the RIIO framework were for the gas distribution networks and the electricity and gas transmission networks. Work on these price controls was conducted primarily over 2011 and 2012, with the controls coming into force from 1 April 2013. While the GD1 and T1 price controls were distinct, there were many aspects of the two price controls that were common, including the approach to setting the cost of debt.

Ofgem proposed a rolling debt mechanism with the following properties:

- A 10-year simple average;
- Of the iBoxx indices for GBP Non-Financials of 10+ years maturity, with broad A and broad BBB credit ratings;
- Adjusted to a real basis using 10-year breakeven RPI inflation;
- With no further adjustment for issuance costs of any kind, and no adjustment for any inflation risk premium.

[17] Ofgem, Handbook for implementing the RIIO model, October 2010. https://www.ofgem.gov.uk/ofgem-publications/51871/riiohandbookpdf

[18] Ibid 12.13.

[19] Ibid 12.15.

[20] Ibid 12.16.

Ofgem subsequently received a number of submissions regarding its strategy decision, but ultimately decided to implement the roller as set out above.[21] In taking this decision, Ofgem committed to update the rolling index annually on the last working day in October, with revenues adjusted through the annual iteration process.[22]

B.2 RIIO-ED1

The RIIO-ED1 price control was conducted two years after the GD1 and T1 price controls. Work was conducted primarily over 2013 and 2014, with the control coming into force from 1 April 2015. As a result of this timing, the RIIO-ED1 process was informed by the decisions taken at the first round of RIIO-1 price controls. However, the first major consultation issued by Ofgem as part of ED1, its Strategy Consultation,[23] was published shortly before the GD1 and T1 review processes were completed.

In its Strategy Consultation and its subsequent Strategy Decision,[24] Ofgem signalled its intent to adopt the same policy as at GD1, and to implement that policy as it had at GD1 and T1 by adopting a 10-year roller. The set of issues identified and explored during GD1 and T1 were covered in Ofgem's papers, and Ofgem then considered that the roller design it had developed for those network sectors was fit for purpose for electricity distribution. However, it was clear from Ofgem's commentary that the DNOs had already raised with it the prospect that a simple 10-year roller as applied to GD1 and T1 may not provide a sufficient allowance to ensure that embedded costs would be covered.[25]

Submissions made by the slow track DNOs caused Ofgem to reconsider its policy. In its Draft Determination,[26] Ofgem explained that a number of companies had submitted evidence that its planned 10-year roller would fail to allow sufficient funds to cover their expected debt costs as the averaging period of the roller did not reflect the maturity profile of historical debt across the electricity distribution sector.[27]

Ofgem undertook a wide range of analysis of its own, to explore whether the propositions put by the companies were correct. Ofgem's analysis of different potential roller designs under a range of possible different interest rate cases found that there was material scope for under-recovery of historical debt costs if the 10-

[21] Ofgem, RIIO-GD1: Final Proposals - Finance and uncertainty supporting document, December 2012. Paragraph 3.50. We note that identical decisions were set out in the relevant Final Proposal for RIIO-T1 for NGET and NGGT.
https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/3_riiogd1_fp_finance_and_uncertainty_0.pdf

[22] Ibid. Paragraph 3.25.

[23] Ofgem, Consultation on strategy for the next electricity distribution price controls - RIIO-ED1 Financial issues, September 2012.
https://www.ofgem.gov.uk/sites/default/files/docs/2012/09/riioed1sconfinancialissues.pdf

[24] Ofgem, Strategy decision for the RIIO-ED1 electricity distribution price control, Financial issues, March 2013
https://www.ofgem.gov.uk/sites/default/files/docs/2013/02/riioed1decfinancialissues_0.pdf.

[25] See for example the Strategy Consultation paragraphs 2.19 to 2.22 and the Strategy Decision paragraph 2.32.

[26] Ofgem, RIIO-ED1: Draft determinations for the slowtrack electricity distribution companies, July 2014
https://www.ofgem.gov.uk/sites/default/files/docs/2014/07/riio-ed1_draft_determination_financial_issues.pdf

[27] Ibid. Paragraph 2.35.

year roller were to be adopted, but that this risk would be largely eliminated if Ofgem were to adopt a 10 to 20-year roller.[28]

Ofgem confirmed the position it took in the Draft Determination decision in its Final Determination.[29] As a result, the slow track companies presently have cost of debt allowances based on:

- A 10 to 20-year trombone average;
- Of the iBoxx indices for GBP Non-Financials of 10+ years maturity, with broad A and broad BBB credit ratings;
- Adjusted to a real basis using 10-year breakeven RPI inflation (based on nominal and real 10-year gilts);
- With no further adjustment for issuance costs of any kind, and no adjustment for any inflation risk premium.

B.3 Consultations at RIIO2 on cost of debt methodology

In March 2018 Ofgem began its consultation on its framework for the RIIO-2 price controls,[30] in which Ofgem:

- stated that its indexation approach to setting the cost of debt allowance for RIIO-1 had worked well by reducing forecasting errors, thereby creating significant savings for customers;[31]
- explained the intuitive logic for its use of a roller, i.e. that it considered that the design of the roller would match reasonably the staggered debt issuance over time of an efficient company;[32] and
- noted that 'The use of indexation with trailing averages means there can be differences between the cost of debt actually incurred by an individual company and the allowance calculated by the index. That potential difference should be an incentive on companies to raise finance in the most efficient manner.'[33]

Ofgem also signalled that it considered that its cost of debt approach could be improved, citing empirical evidence that some companies had managed to issue debt significantly cheaper than the indexation allowance.

Ofgem's initial concern appeared to be that some companies had managed to outperform the indexation allowance materially, so their customers had paid 'too much' relative to the companies' actual cost of debt. This made Ofgem's allowance appear over-generous in some cases.

---

28 Ibid. Paragraph 2.37 to 2.45, including Figure 2.1.

29 Ofgem, RIIO-ED1: Final determinations for the slowtrack electricity distribution companies Overview, November 2014. https://www.ofgem.gov.uk/sites/default/files/docs/2014/11/riio-ed1_final_determination_overview_-_updated_front_cover_0.pdf

30 Ofgem, RIIO-2 Framework Consultation, March 2018. https://www.ofgem.gov.uk/system/files/docs/2018/03/riio2_march_consultation_document_final_v1.pdf

31 Ibid. Paragraph 7.6.

32 Ibid. Paragraph 7.8.

33 Ibid. Paragraph 7.9.

However, the challenge Ofgem faced was that only some companies had managed to outperform the allowance. Therefore, if it were to lower the benchmark allowance for all companies within a sector, some may be left under-funded, in particular companies that issued long dated debt at higher coupons before the financial crisis.[34]

Ofgem concluded in the March 2018 consultation paper that there may be scope to improve on its RIIO-1 approach to setting the cost of debt allowance. Ofgem put forward three options for consideration:

- **Option A: Recalibrate the RIIO-1 indexation approach** (e.g., potentially by varying the length of the trailing average; giving 100% weight to the A-rated (or BBB-rated) index rather than equal weight to the A-rated and BBB-rated indices; weighting the index by individual companies' RAV growth; or taking into account individual companies' ability to issue at lower rates than the benchmark indices);
- **Option B: Set a separate allowance for existing debt plus indexation for new debt**. This would move Ofgem's policy in the direction of that proposed by Ofwat for its PR19 price control, which applies a fixed allowance for the embedded cost of debt and an indexed allowance for any new debt raised over the price control; and
- **Option C: Allow full pass-through of the cost of debt.** In putting forward this option, Ofgem expressed concern over the incentive properties of this approach and the potential for it to allow the inefficient over-recovery of costs from customers.

Ofgem returned to its potential future roller design options in its July Decision Paper, providing further thought and commentary on stakeholder feedback received.[35] A number of relevant points emerged from that Decision:

- **Pass through ruled out**: Ofgem eliminated the potential pass through of cost of debt from its options, based on efficiency and incentive concerns.[36]
- **Existing roller or two-part allowance retained for now:** Ofgem signalled its intent to retain Option A and Option B from its March consultation for further consideration.[37]
- **Company specific versus sector average**: However, it noted that in each case, there was scope to implement these options targeting a sector average allowance, or at the level of the individual company.[38]
- **Introducing a sharing factor:** Ofgem also signalled the potential for it to introduce a sharing factor. This would operate in the same way as the sharing factor on expenditure currently applies, increasing/decreasing each company's allowance based on the gap between the actual cost of debt and the allowed cost of debt. Ofgem noted that any sharing factor may be asymmetric, based

[34] Ibid. Paragraph 7.14.

[35] Ofgem, RIIO-2 Framework Decision, July 2018. https://www.ofgem.gov.uk/system/files/docs/2018/07/riio-2_july_decision_document_final_300718.pdf

[36] Ibid. Paragraph 6.18.

[37] Ibid.

[38] Ibid. Paragraph 6.14.

on a proposal put forward by the Citizens Advice Bureau (CAB), but did not signal that it preferred this approach.[39]

Ofgem published a suite of further papers in December 2018 as part of its Sector Specific Methodology Consultations for the GD2 and T2 controls. This paper stated that as a matter of principle '*The price control allows companies to recover the costs of running their networks including the costs of financing their activities.*' and in particular that this should include '*the returns to the debt holders who lend money to the companies*'.[40]

In respect of the cost of debt, the Finance annex provided some further insights into how Ofgem is minded to proceed. We note that this paper does not provide a definitive direction. It does however present a slightly clearer picture of how Ofgem presently contemplates setting the cost of debt allowance, even if it stops short of taking decisions at this time.[41] Ofgem's discussion focused on:

- **Partial indexation**: In its latest paper Ofgem now refers to Option B, as described above, as partial indexation.[42] It noted the potential benefits of this option:[43]
  - that it allows greater flexibility to include debts raised outside the period of some simple rolling mechanism; and
  - the potential to better fit allowances to the actual cost of debt.

  Ofgem also noted a range of potential downsides should it choose to adopt this as a policy going forward, including:[44]
  - the potential weakening of incentives in the short- and long-term, given that debt costs would become closer to pass through after one price control;
  - challenges in fitting the model, such as the need for Ofgem to now estimate the proportion of new and old debt;
  - the scope for error in forecasting elements of this method; and
  - an increase in complexity and lack of transparency.

  Ofgem also considered that partial indexation would not reduce the need to recalibrate or reanalyse the cost of debt at each price review. This may imply that Ofgem would regard finding a mechanism that avoided the need for such recalibration could be preferred.
- **Sharing cost of debt outperformance**: Ofgem has signalled that it is not minded to move to a system of cost of debt performance sharing despite noting the potential for this to improve company credit metrics. Ofgem's main concerns were around the practical difficulties in reconciling companies' actual cost of debt against the allowed cost of debt, which would be necessary to implement a performance sharing mechanism, the risk of introducing an

39 Ibid. Paragraph 6.27.

40 Ofgem, RIIO-2 Sector Specific Methodology, December 2018. Paragraph 10.9.

41 Ofgem, RIIO-2 Sector Specific Methodology Annex: Finance, December 2018. https://www.ofgem.gov.uk/system/files/docs/2018/12/riio-2_finance_annex.pdf

42 Ibid . Paragraph 2.3.

43 Ibid . Paragraph 2.7.

44 Ibid. Paragraph 2.8.

incentive to manipulate debt costs and the allocation of greater financing risk to customers.[45]

- **CPIH-based allowances**: Ofgem has noted the need for it to change its approach to deriving real allowances, given that it is unaware of a reliable market-based measure of breakeven CPIH inflation. Ofgem will consider two options, i.e. to deflate by implied breakeven RPI and to add a wedge, or to deflate using OBR forecasts of CPI.[46] It intends to consult on these options.
- **High bar for change**: Ofgem has reiterated its view that it would need to see strong evidence for it to change its existing approach.[47] This appears to imply that it will continue to base its cost of debt allowances at GD2 and T2 on the sector average cost of debt. In respect of partial indexation and outperformance sharing, it has signalled that its current minded to position is not to adopt either, unless compelling evidence is presented in responses to the December consultation.
- **Limiting financial outperformance**: Ofgem has also noted that it may include outperformance/underperformance on the cost of debt within its Return Adjustment Mechanisms.
- **Adjustment for company circumstances:** Ofgem has noted that, as at RIIO-1, there is scope for it to consider adjustments to indexation mechanisms should the circumstances of individual companies justify this.

In terms of next steps, Ofgem outlined the analysis it now intends to undertake and noted that it will only be possible to complete this work later in the process, after it has received company business plans.[48] In our view the next steps proposed by Ofgem are broadly consistent with the process it adopted at RIIO-1.

[45] Ibid. Paragraph 2.12.
[46] Ibid. Paragraph 2.14.
[47] Ibid. Paragraph 2.19
[48] Ibid. Paragraphs 2.22 to 2.26.

frontier economics

www.frontier-economics.com