RIIO-ED1: REVIEW OF THE DNOS' BUSINESS PLANS

ANNEX 2: COST OF CAPITAL

A REPORT FOR CENTRICA

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IMPORTANT NOTICE

EXECUTIVE SUMMARY

E.1.   Introduction

The electricity distribution network operators (DNOs) have submitted their business plans to Ofgem for the next electricity distribution price control (RIIO-ED1). In this paper we set out CEPA's initial assessment of the weighted average cost of capital (WACC) for RIIO-ED1 and provide our initial comments on the DNOs' business plans.

E.2.   Key points

The business plans submitted by the DNOs reach a similar conclusion on the cost of capital, with each presenting notional gearing of 65%, a cost of equity of 6.7-6.8% and agreeing with the current RIIO approach for cost of debt indexation.

Having conducted our own analysis (see below), we show that the proposed cost of equity is above our range and the cost of debt indexation approach should be further investigated as the current approach appears overly generous, though we support the use of cost of debt indexation by Ofgem in reducing risks for the companies and consumers.

This is illustrated in Table E.1, which compares our WACC parameter estimates with the DNOs' business plan proposals.

Table E.1: CEPA assessment of WACC for RIIO ED1

	CEPA Estimate		DNOs
	Low	**High**	**Business plans**
Gearing	65%	65%	65%
Risk free rate	1.5%	1.75%	2.0%
ERP	5.0%	5.0%	5.0-5.25%
Equity beta	0.90	0.95	0.90-0.94
Post-tax cost of equity	6.00%	6.50%	6.7-6.8%
Cost of debt	2.46%*	2.74%+	2.74%+
Post-tax vanilla WACC	3.7%	4.1%	4.1-4.2%

Source: CEPA calculations; DNO Business plans.

Note: DNO Business plan figures state that they are dependent on being fast tracked.

* Note: The cost of debt figure of 2.46% corresponds to the current cost of debt figure in July 2013 from CEPA's alternative cost of debt indexation approach (using the ten year trailing average).

+Note: The cost of debt figure of 2.74% corresponds to the current cost of debt figure in July 2013 from the Ofgem proposed cost of debt indexation approach (using the ten year trailing average).

Accompanying their cost of capital parameter proposals, an argument that a number of DNOs also appear to make is that their proposed cost of equity is dependent on their plans being fast tracked and receiving the additional income rewards associated with this process.

They argue that they were allowed additional (positive) expected returns from Information Quality Incentive (IQI) additional income at DPCR5, on top of their headline DPCR5 cost of equity, however, this benefit will now be removed for slow-tracked DNOs given the changes Ofgem is proposing with its ED1 IQI policy.

The fast-track arrangements by contrast will maintain the existing levels of incentive rewards for DNOs with an expected boost to the available return on regulated equity of approximately 100 basis points (bps).[1] The DNOs argue that while a headline cost of equity of 6.7% would, therefore, be consistent with being fast-tracked and DPCR5 (because of the additional income rewards available under this process) if this return is no longer achievable under the slow-track IQI process, it should be recognised instead in the baseline cost of equity.

Hence, the DNOs' argue, their proposed headline cost of equity (6.7-6.8%) is contingent on their business plans being fast-tracked.

As set out in our accompanying report on cost efficiency and expenditure[2], our interpretation of the DNOs' proposal is that they are seeking to justify their required return on equity based on maintaining the status quo (i.e. DPCR5) equity returns package, including from totex incentives, rather than evidence on their real stand-alone cost of capital.

By claiming an additional income uplift (consistent with DPCR5) must be achievable through the IQI (as is the case with the fast-track process and the DNO business plan proposals) or recognised in the baseline cost of equity, the companies are effectively arguing that the expected, normal rate of return, from electricity distribution is higher than the headline 6.7% cost of equity quoted in their plans and Table E.1 above.

Our WACC calculations in contrast are based on a standalone company and are independent of returns from other mechanisms. We do not support the view that the cost of equity should rise if a company has not been fast tracked, as at least five of the six companies have set out. Ofgem should ensure that the cost of capital parameters remain appropriate in this context.

Related to this point, is the observed Return on Regulated Equity (RoRE) analysis for the electricity distribution sector the first two years of DPCR5, which shows that DNOs have made significant returns above that set out for the cost of equity.[3]

The subsections which follow (and the main report) therefore set out our initial assessment of each building block of a DNO WACC. This is independent of whether the business plan is being considered for the fast-track or slow track review process.

We would encourage Ofgem to adopt a similar approach in completing its assessment of the allowed rate of return for ED1.

E.3. Notional gearing

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[1] Analysis of the Price Control Financial Models submitted alongside the companies' business plans shows that the additional 2.5 percent on totex (provided to a fast-track company) is forecast to provide an additional 94.5 to 116.5 bps on the RoRE. The whole-industry boost to RoRE was 106.5 bps.

[2] CEPA (2013): 'RIIO-ED1: Review of the DNOs' business plans – Cost Efficiency and Expenditure'

[3] See Imercon / ECA (2012): 'RIIO reviews – Financeability Study'

We agree with the business plans that there does not appear to be compelling evidence at this point to change notional gearing from the 65% level in DPCR5. Once there is greater certainty around costs, notional gearing should be tested as part of financeability analysis.

Our initial analysis finds that the DNOs and broader UK networks appear to sustain a gearing level around this mark under the target credit rating of BBB+ to A-, and agree that company management should make the decision on the actual level of gearing.

E.4. Cost of equity

The DNOs proposed range of 6.7-6.8% is slightly above our upper bound for the cost of equity range (CEPA proposed range is 6.0-6.5%). Their proposals are also towards the upper bound of Ofgem's RIIO-ED1 strategy decision range, although consistent with the cost of equity allowance in DPCR5, and Ofgem's recent RIIO-GD1 determination. Nevertheless, in our view, the DNOs' proposals on cost equity do contain a degree of headroom.

Risk free rate

Aiming up and giving a risk free rate of 2.0% is relatively consistent with regulatory precedent, but would mean giving a risk free rate which is 281 bps above the current ten year ILG spot rate and 101 bps above the ten year average for the ten year ILG yield. Rates below 2.0% have been present for almost a decade with a few minor interruptions, suggesting long-term factors are present and this is not just due to short-term distortions.

Market expectations point to an average risk free rate over RIIO ED1 of 0.4%, so by choosing a risk free rate of 2.0%, Ofgem is significantly deviating from this position. The cost to consumers of this headroom is c. £800m over RIIO ED1, based on an estimated industry RAV of £18bn.

We therefore recommend a range of 1.5%-1.75% for the risk free rate, which better reflects market reality and expectations of expected rates over the ED1 period, whilst allowing a sufficient degree of headroom.

Equity Risk Premium

Several companies adopt a similar approach to CEPA in using evidence from Dimson, Marsh and Staunton in the Credit Source Investment Sourcebook 2013. This gives an upper bound of 5.0% using the arithmetic mean and the longest available time horizon for the UK. Any figure above 5.0% would in our view represent headroom over what market evidence suggests and caution should be used in combining this upper bound with the top end of the equity beta range.

Given the decrease in the risk free rate, we take the upper bound of a broader range of 4.5-5.0% thereby continuing our long term view of the combined market cost of equity (i.e. risk-free rate plus equity risk premium) of 6-7% (real).

Equity beta

Our relative risk analysis points to a risk for ED1 which is very similar to DPCR5 and RIIO GD1. In terms of totex to RAV, ED1 appears to be slightly less risky than DPCR5 and we

would disagree (as Ofgem has done) with arguments that the extension to an eight year (from a five year) price control requires an increase in the equity beta.

Market evidence suggests there is a risk of significant headroom when looking at the re-levered equity beta at 65% for UK network companies. The average five year equity beta for National Grid, SSE, United Utilities, Severn Trent and Pennon Group is just 0.72 on a market capitalisation basis or just 0.41 on a total equity basis. Comparing this current market evidence on low levels of equity betas to an allowance of 0.95 would indicate a cost of equity that would be 2.7% lower than the DNOs' proposals; a saving to consumers over RIIO ED1 of £4.6bn based on the total equity approach (again based on an average industry RAV of £18bn). Whilst we do not recommend an equity beta as low as the total equity approach would suggest, this does serve to illustrate that a 6.7% allowance would contain headroom.

E.5.   Cost of debt

We support Ofgem's decision to index the cost of debt, as has been introduced for both RIIO GD1 and T1. The agreement by each company to adopt the same indexation approach shows that this is relatively well understood and acceptable to companies and investors.

However, our analysis does not support with the argument put forward in the DNOs' ED1 business plans that the companies are faced with a diminishing 'halo' effect.

Current yields indicate that DNOs can issue new ten year debt at rates c. 129 bps below the spot rate for the proposed cost of debt indexation mechanism (and significantly below the ten year trailing average). The cost to consumers of this headroom would be £1.2bn over ED1.

Whilst we support the majority of the proposed indexation approach, we think it unlikely that the use of the ten year plus bonds, with an average tenor of close to 20 years, accurately represents the efficient financing strategy of and costs faced by the DNOs. For example, UK Power Networks (UKPN) set out in their business plan, that for the forthcoming price control period, they will have as much ten year plus debt as less than ten year debt[4].

We therefore propose consideration of a mix of tenors that better reflects efficient financing strategies, rather than just the ten year plus tenors. Our proposed approach is to use the iBoxx 3-5yr, 7-10yr and 15yr+ buckets. This would reduce the current ten year average by 28 bps. With the significant headroom potential noted above, the DNOs should still be able to cover debt issuance and transaction costs whilst still outperforming the allowance.

E.6.   Conclusion

Given the headroom noted above, both on the cost of equity and the cost of debt indexation mechanism, we believe Ofgem may be being overly generous to the DNOs should the companies be fast-tracked and given their proposed cost of capital.

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[4] UKPN (2013) ED1 Business plan, Annex 17: Financeability of the business plan, p.7

1. INTRODUCTION

1.1. Context

The electricity distribution network operators (DNOs) have submitted their business plans to Ofgem for the next electricity distribution price control.

The price control will set the outputs the DNOs need to deliver for their customers and the associated revenues they are allowed to collect for the eight-year period from 1 April 2015 to 31 March 2023. It is the first price control review in the electricity distribution sector to be conducted under Ofgem's new RIIO model (Revenue = Incentives + Innovation + Outputs) and is, therefore, referred to as RIIO-ED1.

Before completing its initial assessment of the business plans, which will impact on the form of assessment that Ofgem expects to apply to individual DNOs over the course of price review, Ofgem has asked for stakeholder views on the plans.[5] It has asked stakeholders to feedback on a number of areas, including whether:

- the overall quality of the plans are comprehensive and well-justified, and provide clear expectations of what the DNOs will deliver in RIIO-ED1;

- the plans reflect what customers value, and accommodate the views of final consumers, suppliers and investors from stakeholder engagement; and

- the DNOs have identified and justified their expenditure requirements to deliver their output proposals over the eight year price control period, including the package of proposed finance measures.

Centrica, as a key integrated user of the electricity distribution network, has commissioned CEPA to provide our independent view and assessment of the DNOs' plans to help inform its response to Ofgem's consultation.

1.2. Remit

We have been asked by Centrica to focus on a number of key price review areas, such as the DNOs' proposals on financial parameters, the interactions between incentives, DNO outputs and expenditure plans, and whether the DNOs plans overall, appear sufficiently well-justified to qualify for the rewards of being "fast-tracked" through the RIIO-ED1 review process.

In this paper we set out CEPA's initial assessment of the weighted average cost of capital (WACC) for RIIO ED1. This is a response to the WACC estimates recently published by the DNOs in their business plans. The results of our calculations are set out below in Table 1.1. A detailed discussion of the evidence behind these results is contained in Sections 2 to 4.

This report provides a first review of where we think the most significant differences exist between our own estimates and those of the DNOs.

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[5] Ofgem (2013): 'RIIO-ED1: Electricity Distribution Networks Operators' (DNOs) business plans – publication, views and next steps'

Table 1.1: CEPA assessment of WACC for RIIO ED1

	CEPA Estimate		DNOs
	Low	**High**	**Business plans**
Gearing	65%	65%	*65%*
Risk free rate	1.5%	1.75%	*2.0%*
ERP	5.0%	5.0%	*5.0-5.25%*
Equity beta	0.90	0.95	*0.90-0.94*
Post-tax cost of equity	6.00%	6.50%	*6.7-6.8%*
Cost of debt	2.46%*	2.74%+	*2.74%+*
Post-tax vanilla WACC	3.7%	4.1%	*4.1-4.2%*

Source: CEPA calculations; DNO Business plans.

Note: DNO Business plan figures state that they are dependent on being fast tracked.

* Note: The cost of debt figure of 2.46% corresponds to the current cost of debt figure in July 2013 from CEPA's alternative cost of debt indexation approach (using the ten year trailing average).

+Note: The cost of debt figure of 2.74% corresponds to the current cost of debt figure in July 2013 from the Ofgem proposed cost of debt indexation approach (using the ten year trailing average).

1.3. Structure of document

In the remainder of this note we set out:

- in Section 2, notional gearing and how this affects financeability;

- in Section 3, discussions on the cost of debt; and

- in Section 4, our view on the cost of equity.

2. NOTIONAL GEARING AND FINANCEABILITY

Notional gearing is primarily an issue of financeability and as such is not discussed extensively in this report. But as notional gearing is also an input into the cost of equity calculation (since it must be used to re-lever the asset beta to produce an equity beta assumption), as well as the overall cost of capital, we provide some high level thoughts and analysis to guide our assumptions.

2.1. Evidence

Our initial assessment of notional gearing is based largely on the experience of relevant comparators, and the gearing levels they have been able to sustain.

Figure 2.1 below shows the debt to RAV gearing ratios for comparator companies.

*Figure 2.1: Debt to RAV gearing ratios for comparators*
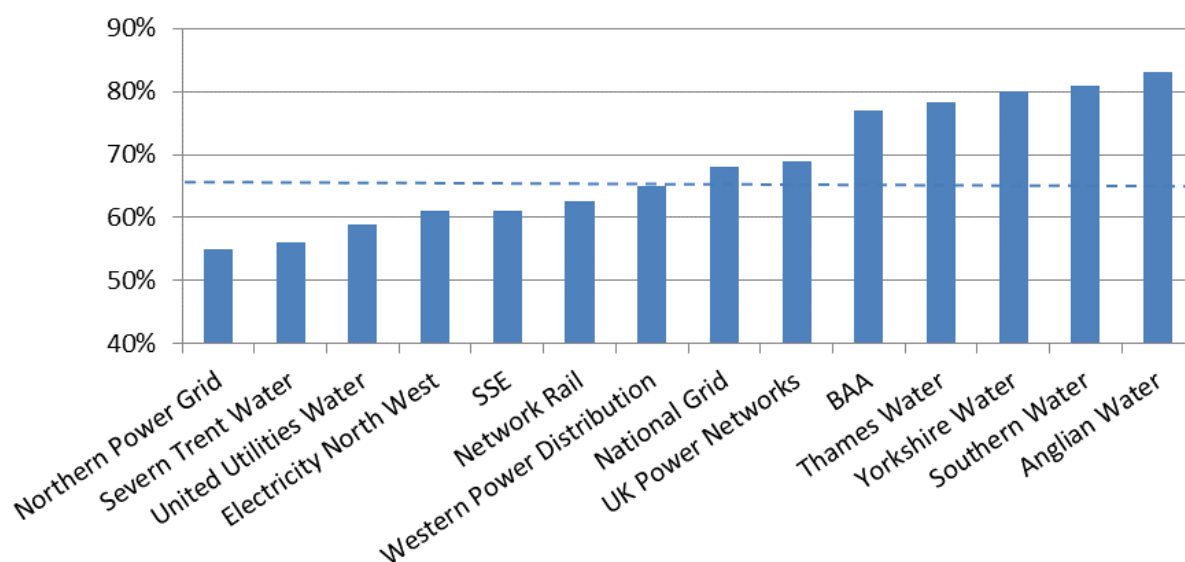
Source: Annual reports, Bloomberg, BAA

Rates over the dotted line of 65% have been sustained by all bar five companies and over 75% have been sustained by BAA and four water companies. Companies with gearing over 75% have maintained at least a BBB- rating, the lowest possible investment grade credit rating[6], whilst there are some A- rated companies which have gearing above 65%. Moody's takes 75% as the upper end of their range for broad BBB rated companies,[7] although this is just one of several metrics and qualitative factors that are taken into account. Figure 2.2 shows how the gearing and credit rating interact for these comparators.

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[6] This is according to credit rating agencies, but regulators may target something different e.g. 'solid' investment grade.

[7] Rating is given as Fitch equivalent. Moody's rating is Baa.

Figure 2.2: Credit ratings of comparator companies
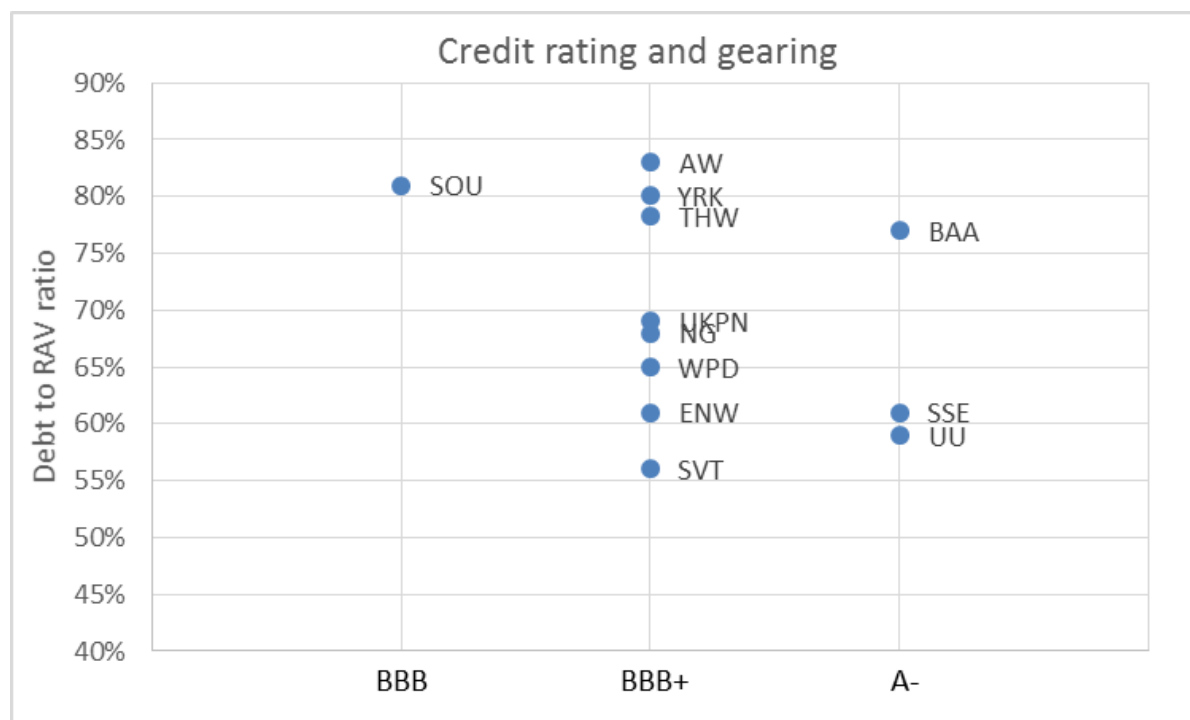
Source: Moody's credit ratings (noted in Fitch equivalent categories), Annual reports.

Note: Network Rail is not included as it receives a debt guarantee from the UK government, raising its credit rating to AA+.

Key: SOU – Southern Water, AW – Anglian Water, YRK – Yorkshire Water, THW – Thames Water, UKPN – UK Power Networks, NG – National Grid, WPD – Western Power Distribution, ENW – Electricity North West, SVT – Severn Trent, BAA – Heathrow Airport, SSE – SSE plc, UU – United Utilities.

2.2. Assessment

At this stage, we believe that a central assumption of 65%, as per the DNO business plans, would be appropriate. We recommend that this range is revisited in line with Ofgem's financeability assessment, which will look into financial metrics and their implications for credit ratings in light of other model inputs, such as decisions on capitalisation rates and the other cost of capital parameter estimates.

Table 2.1: CEPA assessment of the assumed level of gearing

	CEPA Estimate	
	Low	**High**
Gearing	65.0%	65.0%

Source: CEPA calculations

3. COST OF DEBT

3.1. Introduction

In this section we comment on Ofgem and the DNOs' proposals on the cost of debt component of the allowed return for RIIO-ED1. The cost of debt allowance should provide a reasonable return to cover efficient costs for fixed financing, floating rate debt and any new debt. In both the RIIO-GD1 and T1 price controls, cost of debt indexation has been used.

This involves basing the cost of debt component of the allowed return on a long-term trailing average of the yield on sterling-denominated bonds. The proposed design of Ofgem's indexation mechanism for RIIO-ED1 is summarised in Table 3.1 below.

Table 3.1: Ofgem RIIO-ED1 strategy decision on cost of debt indexation mechanism

#	Proposed design parameters
1	The cost of debt assumption in the WACC will be based on a 10-year simple trailing average index (with provision for companies to justify alternatives in exceptional circumstances)
2	The ED1 cost of debt allowance will be updated annually over the proposed eight year price control period
3	Ofgem will use an average of the iBoxx GBP Non-Financials indices of 10+ years maturity, with credit ratings of broad A and broad BBB
4	Ofgem will deflate the adopted iBoxx indices by 10-year breakeven inflation data published by the Bank of England
5	No adjustments will be made in the index for debt issuance fees, liquidity management fees, new issue premium or the inflation risk premium.

Source: Ofgem and CEPA

We assume in line with Ofgem's strategy decision paper that the DNOs allowed cost of debt will be indexed in RIIO ED1. We support the continued use of indexation as a mechanism which removes the need for estimating an allowance which will require explicit 'headroom' for uncertainty purposes and reflects the efficient financing costs for the DNOs through a mechanism which is now familiar to the companies and investors.

However, in this section we do suggest one potential change to the indexation mechanism with respect to the tenor of the bond indices used to help improve its design. Apart from this modification, we believe it is appropriate to take the mechanism forward in an otherwise largely unchanged fashion from Ofgem's RIIO-ED1 strategy decision.

3.2. Indexation

In design and implementation, it is important that the cost of debt indexation mechanism reflects the specific case of electricity DNOs rather than simply continuing with the proposed approach. This means that, in our view, the debt profile of the electricity DNOs must be taken into account with regards to the application of this methodology.

The iBoxx 10yr+ indices currently have a combined average maturity of almost 20 years[8]. If the average life of electricity DNO debt is significantly below this, it would suggest that the 10yr+ indices may be inappropriate and alternatives should be considered.

Our initial analysis suggests that the average remaining maturity of debt for electricity DNOs is likely to be closer to 13 years, rather than 20 years. UK Power Networks, for example, have also set out in their business plan that they will raise debt using shorter maturity bonds[9]. They also say that there will be an equivalent proportion of 'less than ten year' debt, as 'more than ten year' debt, so it may not be appropriate for indexation to only include the ten year-plus proportion.

The effect on efficient financing costs will also be dependent on the averaging process due to the shape of the yield curve. Using average maturities rather than averaging yields may not reflect the situation faced in the debt markets by companies. If, for example, a firm was issuing five year and fifteen year debt in equal proportion, the allowance should reflect 50% of the yield from the five year index and 50% of the yield from the fifteen year index, rather than simply the yield for the ten year bond.

The issue with a simple approach using an average of maturities rather than average of yields is illustrated in Figure 3.1 below.

Figure 3.1: Illustrative case of debt allowances based on different approaches
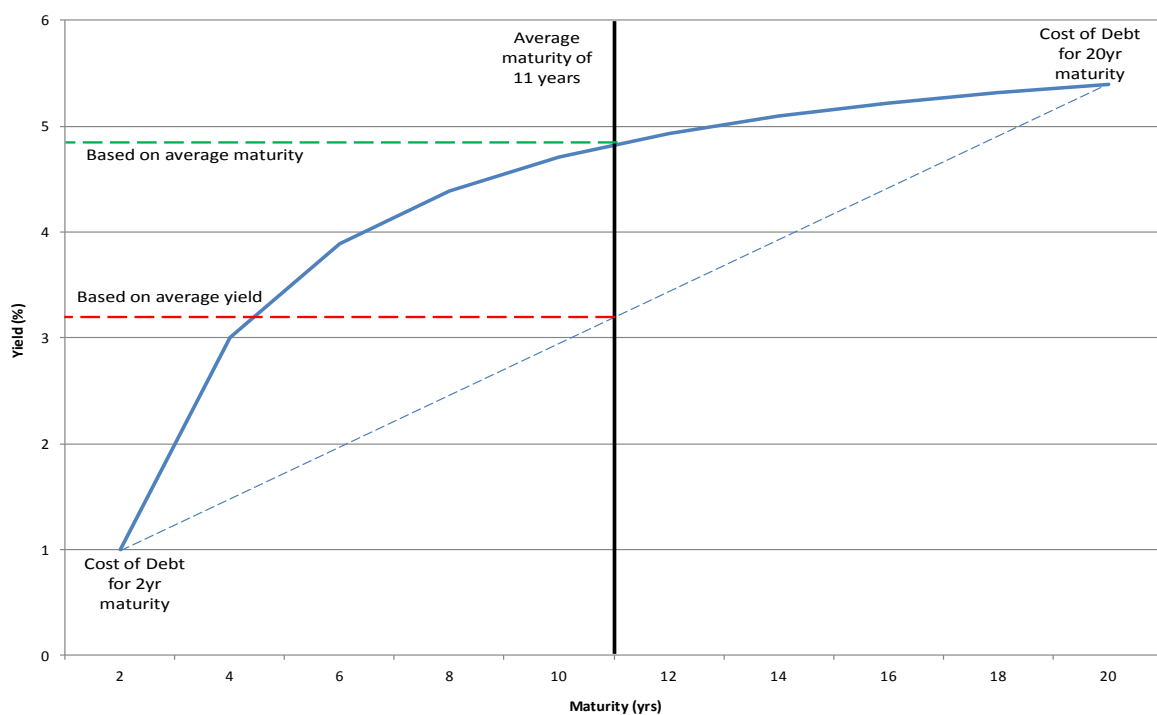
Source: CEPA analysis

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[8] As of 29 July 2013, the BBB non-financials ten years plus years to maturity is 17.72yrs; the A non-financials ten year plus years to maturity is 21.60yrs. The average is therefore 19.7 years for this index.

[9] UKPN (2013) ED1 Business plan, Annex 17: Financeability of the business plan, p.7

Figure 3.1 illustrates a case where the yield curve is not linear and assumes that the company has taken equal proportions of debt with two year maturity and 20 year maturity. This means that the average maturity at that time is 11 years. The green line takes the cost of debt that would be assumed if you took the yield on the 11 year debt, but the red line is the average cost of debt that the company has achieved.[10]

As can be observed, the allowed cost of debt by averaging maturities and reading the yield for that maturity rather than simply taking an average of the yields is significantly higher. This may be giving the companies a more implicit style of headroom in the indexation approach. This may be giving the companies headroom of a more implicit nature in the indexation approach.

Using this logic, an alternative approach which could be used for cost of debt indexation in RIIO-ED1, and that would improve the accuracy of the index, would be to use separate maturity 'buckets' which would then be averaged to reflect the difference in rates across the yield curve.

Figure 3.2 illustrates that since July 2005, yields on longer maturity debt fell slightly in the subsequent six years. Since May 2011 rates have fallen by approximately 100bps and remained relatively stable over the previous six months. In contrast, at the shortest end of the curve, rates have fallen by 350bps since July 2005, although in the last two years rates have not fallen by the same amount as the mid- and longer- maturity debt.

Figure 3.2: Recent movements in the yield curve
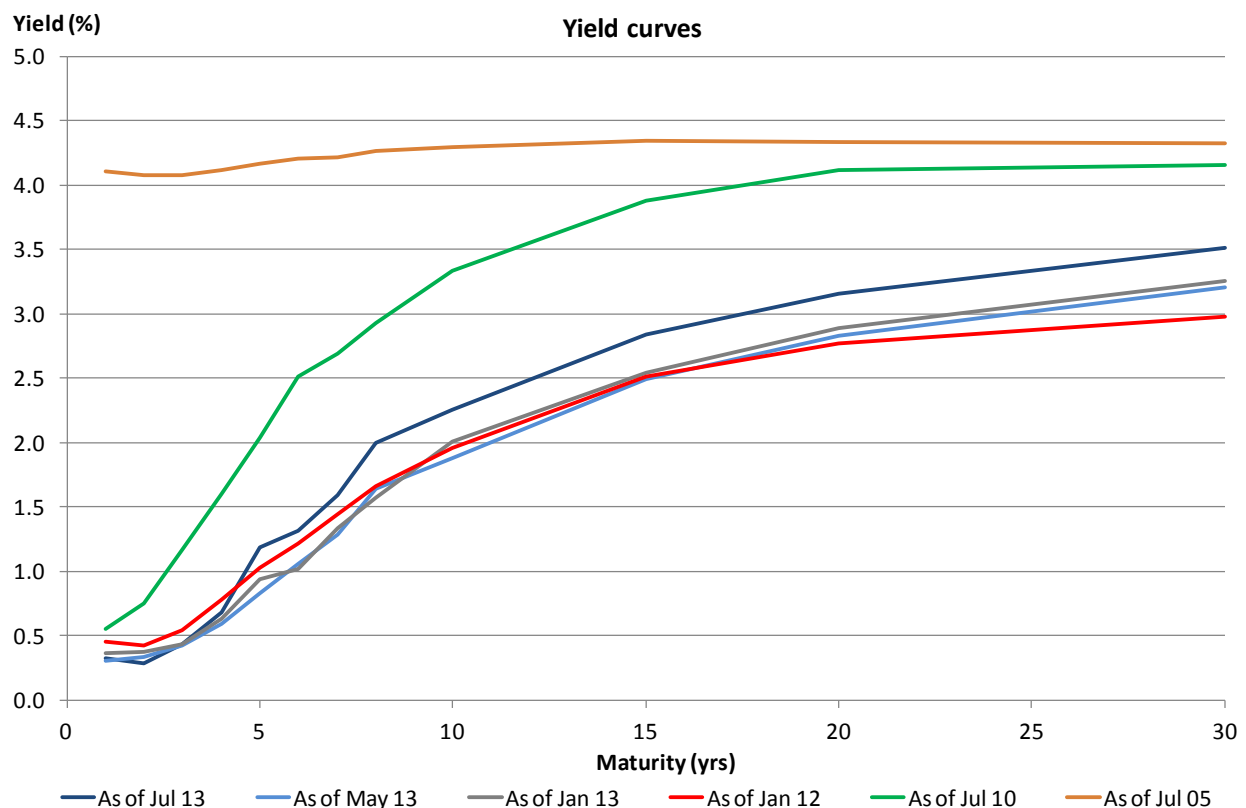
Source: Bloomberg, Bank of England

[10] Taken by the average of yields on two year and 20 year debt.

Adopting an approach where the yields are averaged (as per our proposed indexation approach), rather than the maturity averaged (as per Ofgem's proposed ED1 approach) to come up with a corresponding yield better reflects financing costs.

Our proposed change for the tenor of the indices to be used would, therefore, be to use a shorter-term bucket, medium-term bucket and longer-term bucket. Using iBoxx indices, these could be equally weighted buckets of 3-5yr, 7-10yr and 15yr+ maturity.[11] The average tenor used in this approach would fit with, for example, the bond information for both Northern PowerGrid and UK Power Networks, where the average remaining maturity is 13 years.

3.3. Headroom

Evidence of implicit headroom in Ofgem's proposed indexation approach, includes network companies (including DNOs) historically being able to issue debt at a cost around 53 bps below the index (see Figure 3.3 below)[12].

Figure 3.3: Network company issuances relative to iBoxx indices
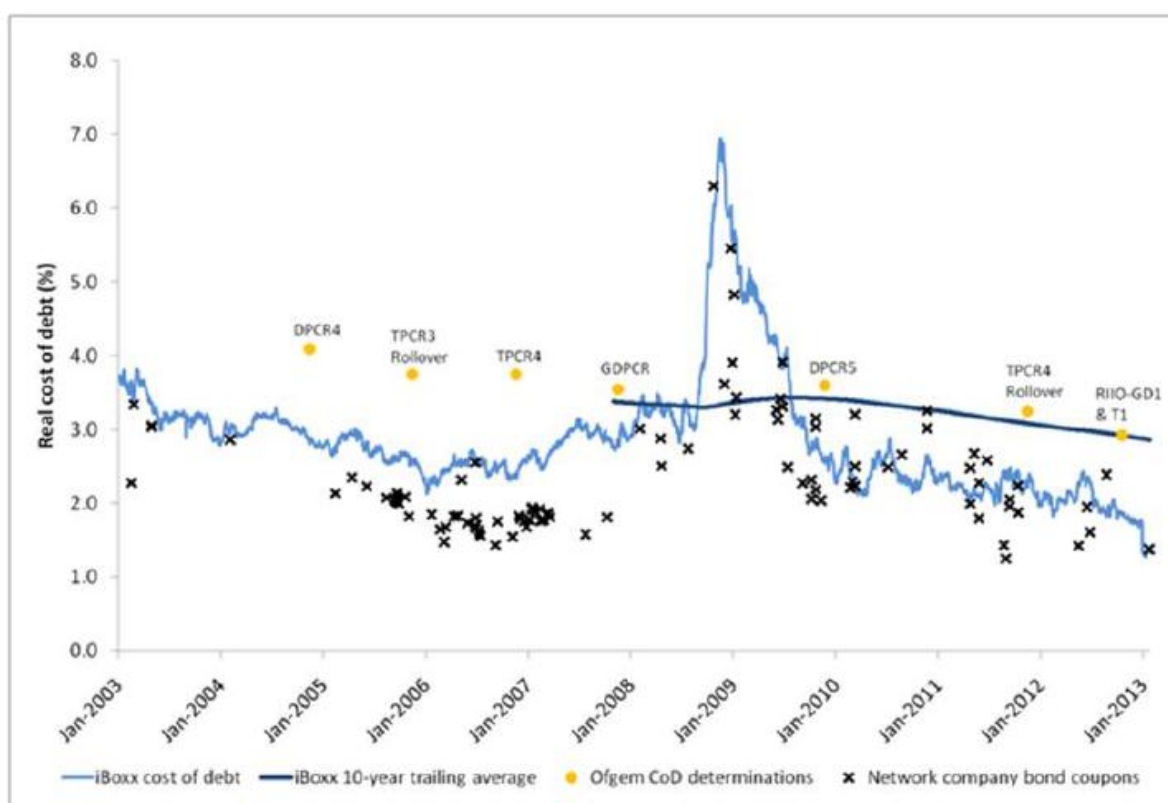
Source: Ofgem, ED1 strategy decision, Financial Issues Supplementary Annex

We concur with Ofgem's view – which was incorporated into the T1 fast-tracking settlement and its RIIO-ED1 strategy decision outlined above – that this provides companies with (at least) sufficient headroom to cover related costs (such as issuance and management fees).

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[11] The current average tenor of this approach would be 12.4 years

[12] Ofgem (2013), ED1 strategy decision, Financial Issues Supplementary Annex

However, looking at current market evidence (and adjusting for debt issuance fees, liquidity management fees etc.) still gives the impression that the indexation approach is overly generous, based on the latest available data.

For example, the spread over gilts for a range of GB energy network bonds, including issuances by electricity DNOs, is shown in Table 3.2 below.

Table 3.2: Spread to gilts today for network bonds

Company	Issue date	Maturity	Credit rating	Amount (m)	YTM[1] today (%)	Equivalent gilt YTM today (%)	Spread to gilt (bps)
NORTHERN PWRGRID	05/07/2012	05/07/2032	A-	£150	4.38	3.139	124
NORTHERN PWRGRID	05/05/2005	04/05/2035	A-	£200	4.516	3.286	123
WESTERN POWER	17/05/2011	17/01/2023	BBB	£100	3.362	2.086	128
WESTERN POWER	17/05/2011	16/04/2032	BBB	£700	4.43	3.139	129
CENTRAL NETWORKS	10/12/2010	10/12/2040	BBB	£800	4.619	3.33	129
CENTRAL NETWORKS	10/12/2010	09/05/2025	BBB	£250	3.811	2.511	130
WESTERN POWER	23/03/2010	23/03/2040	BBB	£250	4.612	3.330	128
WESTERN POWER	23/03/2010	23/03/2040	BBB	£200	4.609	3.330	128
SSE PLC	17/06/2013	17/06/2020	A-	€200	1.911	0.799	111
NATL GRID ELECT	08/06/2012	08/06/2027	A-	£600	3.969	2.847	112
UK Corporate BBB ten-year benchmark spread to gilts (18 July 2013)							*169*

Source: Bloomberg, CEPA analysis

N.B.: today refers to 18 July 2013.

Note 1: Yield to maturity

The current spread to gilts for the UK Corporates BBB ten year benchmark from Bloomberg is 169 bps. We would therefore expect network companies with bonds rated at BBB to face similar spreads. As shown in Table 3.2 above, the BBB bonds have a current spread to gilts of 130 bps.

The target credit rating for an efficient network company is BBB+/A-, so we would expect the debt premium (as indicated by the spread) for these credit ratings to be lower than for BBB bonds. The analysis above suggests that the debt premium faced by a company, should they issue debt today, would be 110-130 bps.

In Table 3.3 below, we calculate the total cost of debt that a DNO would be likely to face for ten year and twenty year debt. Using the analysis in Table 3.2, we assume for the below calculations

that the debt premium faced by a DNO will be 120 bps for issuing a ten year bond or a twenty year bond. We add this to the appropriate gilt to derive a total cost of debt for each tenor.

We find that the total cost of debt for 10 year debt is currently 3.46% and the total cost of debt for 20 year debt would be 4.36%. This compares to an allowance from the Ofgem proposed cost of debt index of 4.75%.

Table 3.3: Comparing the actual cost of debt to the allowed cost of debt

Parameter	Value
10yr UK nom gilt yield	2.26%
20yr UK nom gilt yield	3.16%
Spread over gilts assumption (from previous analysis)	120 bps
Total cost of debt – 10yr debt	3.46%
Total cost of debt – 20yr debt	4.36%
Nominal cost of debt from iBoxx 10yr plus broad A and BBB non-financial corporates	4.75%
Spread to allowance using 10yr total cost of debt	129 bps
Spread to allowance using 20yr total cost of debt	39 bps

Source: Markit iBoxx, Bloomberg

N.B.: As of 18 July 2013.

This analysis would suggest that the companies will be making a large gain relative to the index should they be issuing 10yr debt, and would still have a significant degree of headroom to cover other costs if issuing 20yr debt, although outperformance would be lower. Should there be a 100 bps outperformance, based on an industry RAV of £18bn, the cost to consumers over RIIO ED1 will be c. £1.2bn.

3.4. Assessment

In this section we have commented on Ofgem and the DNOs' proposals on the cost of debt component of the allowed return for RIIO-ED1 focusing on Ofgem's proposed ED1 cost of debt indexation mechanism.

While we support the continued use of indexation as a mechanism which removes the need for a fixed allowance with headroom and reflects the efficient financing costs for the DNOs, we have proposed one potential change to the mechanism with respect to the tenor of the bond indices used in the index.

Our proposed change to the mechanism would remove some of the implicit headroom caused by the shape of the yield curve and tenor for the current indexation approach used in the RIIO price controls.

The current difference between Ofgem's and CEPA's proposals is 28 bps, which would be equivalent to saving consumers c. £271m over RIIO ED1.[13] Our proposed range for the cost of

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[13] Based on an average industry RAV of £18bn.

debt (see Table 3.4 below) includes our altered mechanism (three separate buckets) as the lower bound, with the current RIIO approach (ten year plus indices) taken as our upper bound.

This would help remove some of the significant headroom observed from market evidence on the ability of DNOs to outperform the indexed allowance.

Table 3.4: CEPA assessment of the cost of debt – based on alternative indexation mechanisms

	CEPA Estimate	
	Low	**High**
Cost of debt	2.46%*	2.74%+

Source: CEPA calculations

* Note: The cost of debt figure of 2.46% corresponds to the current cost of debt figure in July 2013 from CEPA's alternative cost of debt indexation approach (using the ten year trailing average).

+Note: The cost of debt figure of 2.74% corresponds to the current cost of debt figure in July 2013 from the Ofgem proposed cost of debt indexation approach (using the ten year trailing average).

4. COST OF EQUITY

4.1. Introduction

There are three components to the cost of equity:

- the risk free rate;

- the equity risk premium (ERP); and

- equity beta.

In this section we first present evidence on these individual parameters, before summarising our view on the overall CAPM-based cost of equity. We then check this approach to evidence from the market, notably comparable transactions and the implications for the WACC.

4.2. Risk free rate

In this section we develop our initial assessment of a range for the risk free rate in RIIO-ED1. We review evidence of historical yields and implied forward rates on government gilts, as well as evidence from regulatory precedent, to inform our assessment.

4.2.1. Historical evidence

We use historic evidence on five, ten and 20 year index-linked UK government bonds (index-linked gilts – ILGs) as a proxy for the risk free rate. As a check, we also consider rates on nominal bonds. We note, however, that the financial crisis and the Bank of England's market interventions mean that recent evidence may not be representative of the true, underlying longer term risk free-rate.

Figure 4.1 and Table 4.1 below presents real yields on ILGs since 2000. Apart from a brief spike towards the end of 2008, there is evidence of a clear, sustained downward trend – one that predates the Bank of England's interventions. This trend resulted in a rate for ten year gilts of c. 1.0% by end-2009. This downward trend has continued (and indeed intensified) in recent years, but this evidence needs to be treated with some caution such that undue weight is not attached to current negative rates when considering the appropriate allowed risk free rate.

Figure 4.1: Real yields on ILGs
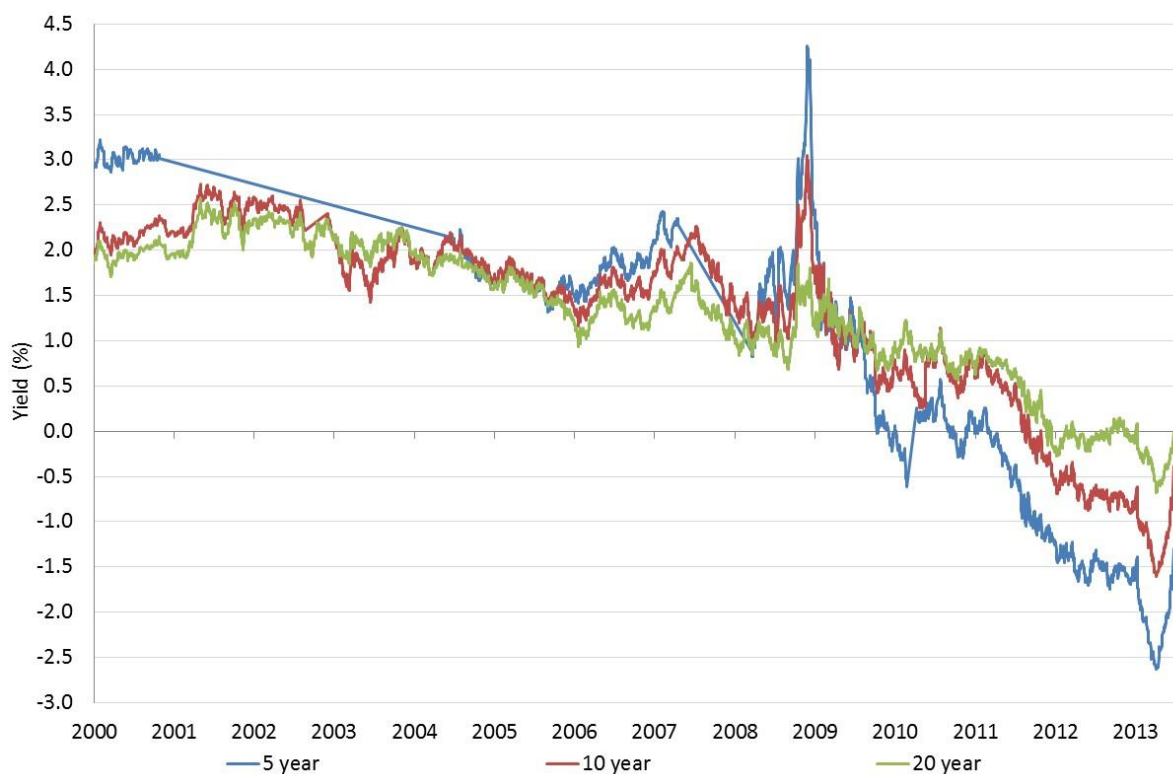
Source: Bank of England, Bloomberg

Table 4.1: Summary of Figure 4.1

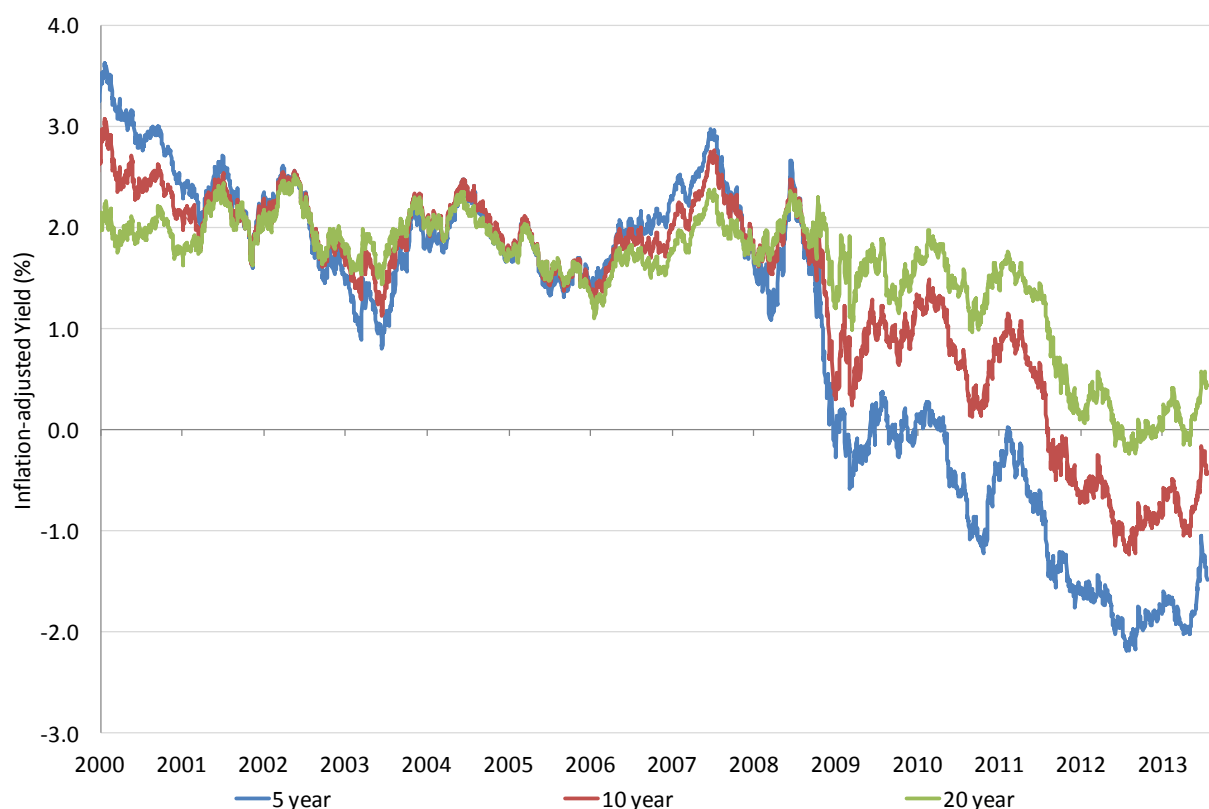| As of 18/07/13 (%)	Spot	1y average	2y average	5y average	10y average
5yr	-1.91	-1.84	-1.54	-0.24	0.54
10yr	-0.81	-0.95	-0.68	0.29	0.99
20yr	-0.11	-0.18	-0.07	0.55	1.03
As of 07/12/09 (DPCR5 decision)					
10yr	0.51	1.11	1.30	1.52	1.83

Source: CEPA analysis of Bank of England and Bloomberg data

Looking at the ten year ILG, there is a 180 bps difference between the ten year average and the current spot rate. This difference is more exaggerated for the five year ILG (245 bps) and is less dramatic for the 20 year ILG (114 bps).

Whilst there has been a significant fall in 2013, the ten year average is now just under 1.0% and falling. This would make it difficult to justify a rate of 2.0% for the risk free rate. The decision of a 2.0% risk free rate for DPCR5 was just 17 bps over the ten year average for the ten year ILG, whereas a current rate of 2.0% would represent a 101 bps increase on this ten year average.

Figure 4.2 and Table 4.2 presents equivalent evidence based on deflated nominal gilts. The overall picture is broadly similar to that for ILGs. The yield on gilts has moved sharply downwards in recent years, and current rates are negative.

Figure 4.2: Real risk free rate as implied by nominal gilts

Source: Bank of England, Bloomberg

Note: inflation taken as the long-term expectation of 2.7% to deflate the nominal gilt.[14]

Table 4.2: Summary of Figure 4.2

As of 18/07/13 (%)	Spot	1y average	2y average	5y average	10y average
5yr	-1.48	-1.81	-1.69	-0.71	0.62
10yr	-0.43	-0.80	-0.65	0.30	1.12
20yr	0.44	0.09	0.23	1.03	1.45

Source: CEPA analysis of Bank of England and Bloomberg data

The results using the nominal basis are similar to those observed from using ILGs, with the differences between the measures being caused by differences in the choice of deflation measure.

A working paper from the Office of Budget Responsibility in November 2011 said that the 2.0% CPI target is now best thought of as an RPI rate of 3.3-3.5%.[15] This would mean the numbers in both Figure 4.2 and Table 4.2 would shift further downwards, given the c. 0.7% rise in the deflator.

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[14] This is based upon a CPI target of 2.0% and the average RPI figure from 1989-2011 being 0.7% above the CPI. This is set out by the OBR: http://cdn.budgetresponsibility.independent.gov.uk/Working-paper-No2-The-long-run-difference-between-RPI-and-CPI-inflation.pdf.

[15] OBR (2011) The long run difference between RPI and CPI Inflation, as above.

4.2.2. Regulatory precedent

In this section we consider evidence of regulatory precedent of the allowed risk free rate and the implications for RIIO-ED1.

Based on an analysis of historical average yields on ILGs and conventional gilts, Ofgem recently proposed in its recent ED1 strategy decision an upper bound for the risk free rate of 2.0%:

> *'We note that there is evidence to suggest that long-term estimates of the risk free rate are currently lower than the 2.0 per cent we set in DPCR5 and in the initial proposals for RIIO-T1 and GD1. However, it has been argued by some, that the Bank of England's quantitative easing policy has pulled down the yield on ILGs by as much as 100 bps. Hence, we have kept 2.0 per cent as the upper bound of the range owing to the possibility than the downward trend described above or quantitative easing are reversed during RIIO-ED1.'[16]*

Therefore, the possible 100 bps effect of quantitative easing appears to be referred to as an upper bound by Ofgem. Subsequent reports have also found a much smaller impact from quantitative easing than 100 bps, for example a 2011 Bank for International Settlement (BIS) report[17], found an impact of 27 bps for the first stage of QE for government bonds with remaining maturity of 5 to 25 years. However, even if the full 100 bps were to be added to the ten year ILG yield from the start of QE in 2009, the current ten year average would still only be c.1.4%.

In order for the ten year average of the real ten year ILG rate to be at 2.0% at the start of ED1, rates would need to rise to 6.1% overnight and remain at that level until the beginning of the price control in April 2015; a rate never observed with our available data set. This can be compared to the current spot rate of -0.8%.

For the ten year average to be equal to 2.0% on average over RIIO ED1, rates would need to immediately rise to 3.0% and be sustained at that level; a level only (very briefly) seen once in the previous fifteen years at the height of the global financial crisis.

Table 4.3 lists decisions made by UK regulators since 2009, and Figure 4.3 (overleaf) presents a longer term view, comparing decisions to historic ILG rates.

Table 4.3: Recent regulators' assessments of the risk free rate

Regulator	Decision	Risk free rate
Ofgem	ED1 Strategy (2015-23)	1.7%-2.0%
CAA*	Heathrow and Gatwick airports (2014-2019)	0.5%
ORR	Network Rail Cost of Capital (2014-2019)	1.5-1.75%
Ofgem	RIIO-GD1 & RIIO-T1 (2013-21)	2.0%
NIAUR	NIE T&D proposals (2012-2017)	2.0%

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[16] RIIO ED1: Consultation on strategy for the next electricity distribution price controls – RIIO ED1 – Financial issues, paras 2.49 and 2.50.

[17] Bank of International Settlements (2011). 'The impact of recent central bank asset purchase programs,'

Ofcom	Mobile calls (2011-2015)	1.4%
CC	Bristol Water (2010-2015)	1.0% – 2.0%
Ofgem	Electricity distribution (2011-2015)	2.0%
Ofwat	Water & sewerage (2010-2015)	2.0%
CAA/ CC	Stansted airport (2009-2014)	2.0%
CAA/ CC	Heathrow and Gatwick airports (2009-2014)	2.5%

Source: Regulatory determinations. Rates presented are before the addition of any 'uplifts'.

Note*: Decisions relate to Initial Proposals

Figure 4.3: Real risk free rates and Regulator determinations
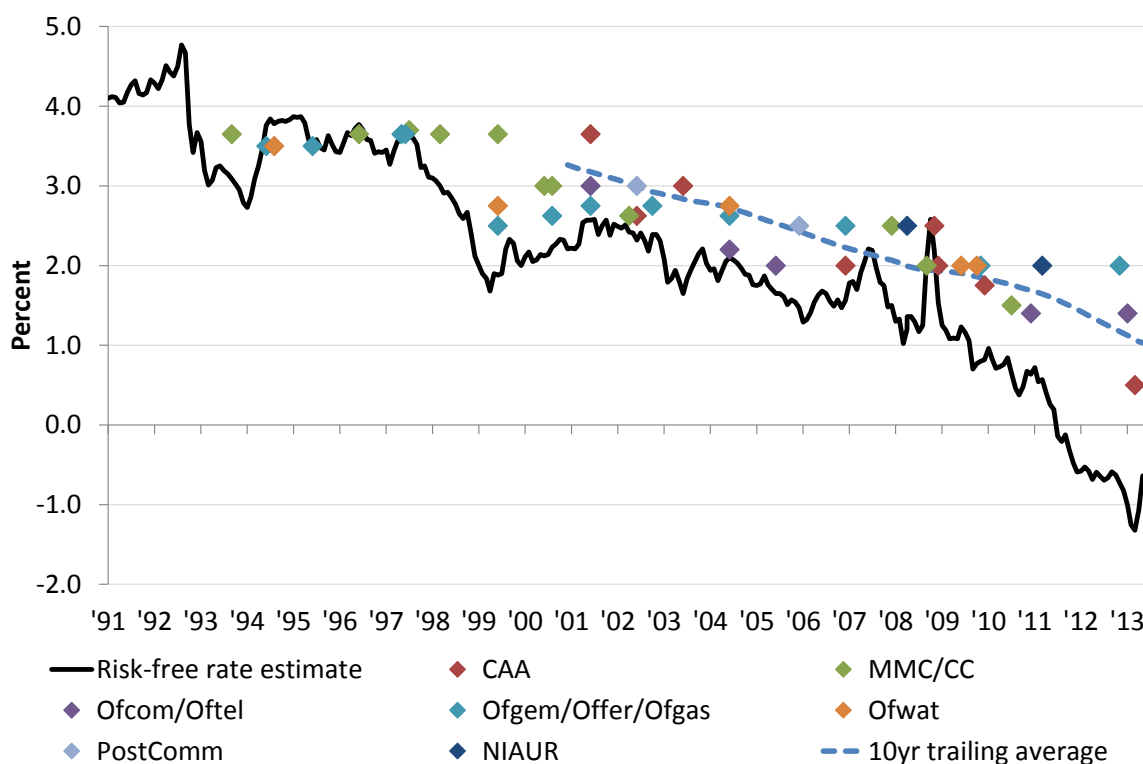
Source: Regulatory determinations and Bank of England, CEPA analysis
Note: Ofgem's RIIO ED1 strategy decision of 1.7-2.0% is not included in the above figure

Previous regulatory determinations have historically been made relatively close to the ten-year trailing average of the real risk free rate.[18]

In our view, such an approach is understandable: the regulator's objective is to reach an expectation for the risk free rate over a period of several years. It would not be appropriate simply to use the spot rate for ILGs.

However, it appears that there is room based on recent evidence for regulators to select lower estimates than the 2.0% that has been the typical range for price controls between 2005 and 2011. Indeed, the Competition Commission (CC) (in its 2010 Bristol Water determination) and Ofcom (in its recent mobile calls decision) both acknowledged that the risk free rate appears to

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[18] This is based upon Index-Linked Gilts.

be below 2%. The CC, in its Bristol Water decision, is also supportive of use of long-dated index-linked yields. It does note that in prior decisions it has been concerned about the distortions in these long-dated instruments but that it now puts more weight on these instruments: *'The prolonged period of low yields may suggest that long-run rather than temporary factors are at work. We therefore now see some grounds for assuming a lower* [risk free rate]*, more in line with actual long-dated index-linked yields.'*[19]

4.2.3. Analysis of forward rates

We have also conducted our own analysis of movement in the risk free rate and what can be learnt about forward ten year rates from current longer term yields. The implied ten year rate based on the real spot curve is shown in Figure 4.4 below.

Figure 4.4: UK implied real spot rate for ten year gilt
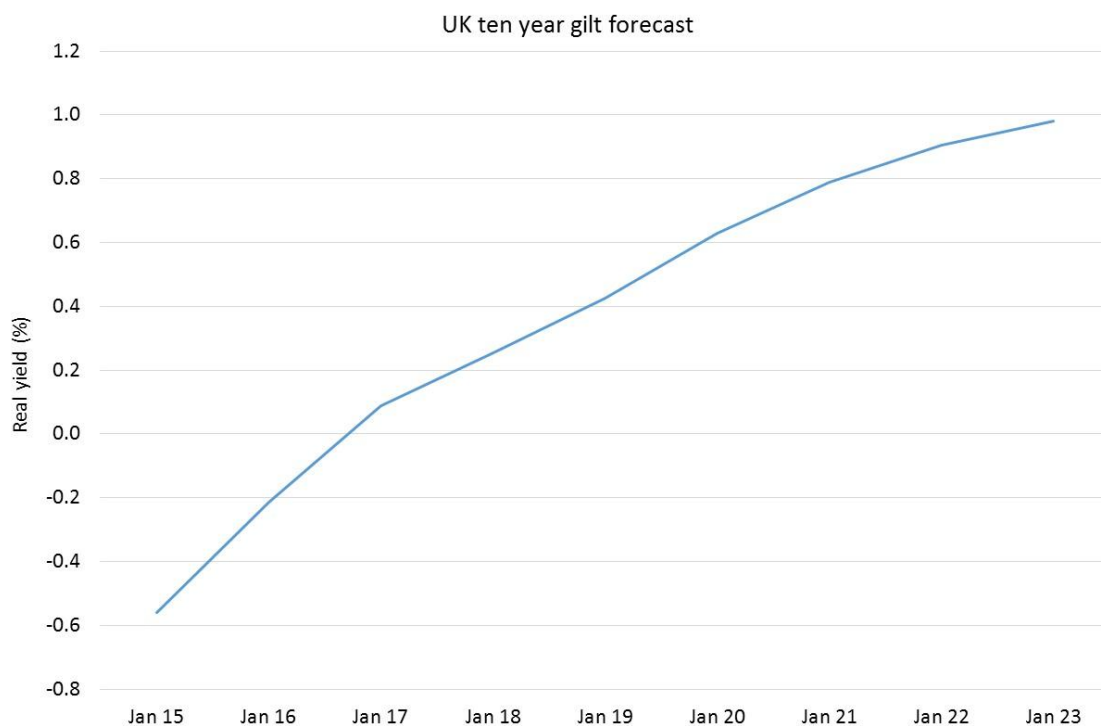
Source: Bank of England, CEPA analysis
Note: this has been deflated by an inflation rate of 3.4%[20]

Figure 4.4 would suggest that rates are expected to rise significantly prior to RIIO ED1, given that current ten year ILG spot rates are c.-0.8%. The average real risk free rate across RIIO ED1 is expected to be around 0.4%, based on the above market evidence. These market expectations will have taken into account the effect of the potential unwinding of quantitative easing and other factors that may influence this rate.

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[19] CC Bristol Water pN19.

[20] This is based on the OBR best estimate for RPI inflation; OBR (2011) The long run difference between RPI and CPI Inflation.

4.2.4. Assessment

Overall, we put limited weight on current negative rates on some tenors. The evidence does however suggest that a rate as low as 1.0% may be justifiable. However, given the considerable uncertainty regarding the underlying risk free rate, we acknowledge that a rate of 2.0% is not inconsistent with regulatory precedent.

Therefore, a broad range of 1.0-2.0% would not be out of the question for RIIO-ED1. However, we prefer a narrower range of 1.50-1.75% which in our view is a reasonable interpretation of the evidence as a whole and gives a degree of headroom to account for uncertainty.

Table 4.4: CEPA assessment of the risk free rate

	CEPA Estimate	
	Low	**High**
Risk free rate (real)	1.50%	1.75%

Source: CEPA calculations

4.3. Equity risk premium

In this section we form our initial assessment of the ERP for RIIO-ED1. As with the risk free rate, we consider historical market evidence and regulatory precedent.

4.3.1. Historical returns data

Observed values for the ERP – produced by comparing the returns on the market with returns on risk free assets – vary substantially depending on:

- whether the benchmark against which the premium is measured is taken to be short-term notes or longer-term bonds;

- the time horizon under consideration;

- the country being measured; and

- whether a geometric or arithmetic average is calculated.

We discuss each of these in turn and provide an estimate based on a standard CEPA approach that is well-documented.

For transparency we focus on the latest figures calculated in the Dimson, Marsh & Staunton *Credit Suisse Global Investment Returns Sourcebook 2013* (DMS), using the longest available time horizon for the UK. For consistency with our evidence on the risk free rate, we focus on the premium over long term government bonds rather than short term bills.

In general, the use of an arithmetic or geometric mean alone will not provide an unbiased estimate for the ERP. In order to achieve this unbiased estimator for long-run returns, Blume (1974) uses a weighted average of the geometric and arithmetic means.[21]

Blume found that if the past was indicative of the future, the arithmetic mean provides a more unbiased and consistent estimate of the expected annual return, while the geometric mean would underestimate the expected annual return. Blume also provides a formula to highlight the appropriate weightings based upon different time horizons.

Applying that formula, based on an assumed investment period of eight years, the share for the arithmetic mean would be c. 94%, with just 6% from the geometric mean. Extending the investment period to 30 years still gives a significant majority share to the arithmetic mean (74% against 26% for the geometric mean). As a result, in forming our view of the ERP, we place greater weight in our analysis on the arithmetic mean.

Table 4.5 below presents evidence based on the longest available time period for the ERP against bonds, using either the arithmetic or geometric mean. Considering the evidence presented within the DMS sourcebook, 5.0% represents an upper limit for our estimate of the ERP, using the arithmetic mean and the longest available time horizon. The market evidence is similar to that observed at the time of the DPCR5 decision.

Table 4.6: UK premium against bonds

Time period	Arithmetic Mean (% p.a.)	Geometric Mean (% p.a.)
1900-2012 (real)	5.0%	3.7%
1900-2008 (real) *	5.0%	3.6%

Source: Dimson, Marsh & Staunton (2013) Credit Suisse Global Investment Returns Sourcebook 2013

* DPCR5 decision

Furthermore, DMS are clear on the subject, as stated below (CEPA insert in square brackets):

> *'The historical* [equity risk] *premium is often summarized in the form of an annualized rate of return. This is a geometric mean. … For the future, what is required is the arithmetic mean … which is larger… We adjust the arithmetic mean* [downwards] *for (i) the differences between the variability of the stock market over the last 101 years, and the variability that we might anticipate today, and (ii) the impact of unanticipated cash flows and of declines in the required risk premium'.[22]*

DMS indicate that both these factors imply that the correct treatment is to shave down the historic arithmetic mean when estimating a forward looking estimate. We consider that the DMS approach is appropriate.

Figure 4.5 below shows how the ERP (based on DMS evidence) has developed over time. The plotted line represents the cumulative (arithmetic) mean up to and including each year on the

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[21] $E(R_N) = \left[\left(\frac{T-N}{T-1} \right) * A_N \right] + \left[\left(\frac{N-1}{T-1} \right) * G_N \right]$

where T is the number of data points used, N is the time period, AN is the arithmetic mean and GN the geometric mean.

Source: Blume, M.E. (1974) 'Unbiased estimators of long-run expected rates of return,' *Journal of the American Statistical Association*, 69:347, pp.634-638.

[22] Dimson, Marsh & Staunton (2012) p194.

horizontal axis. The long term ERP has fallen gradually in recent years to around 5%, from highs of over 6% in the 1970s and 1980s.[23]

Figure 4.5: Cumulative arithmetic average of UK premium against bonds
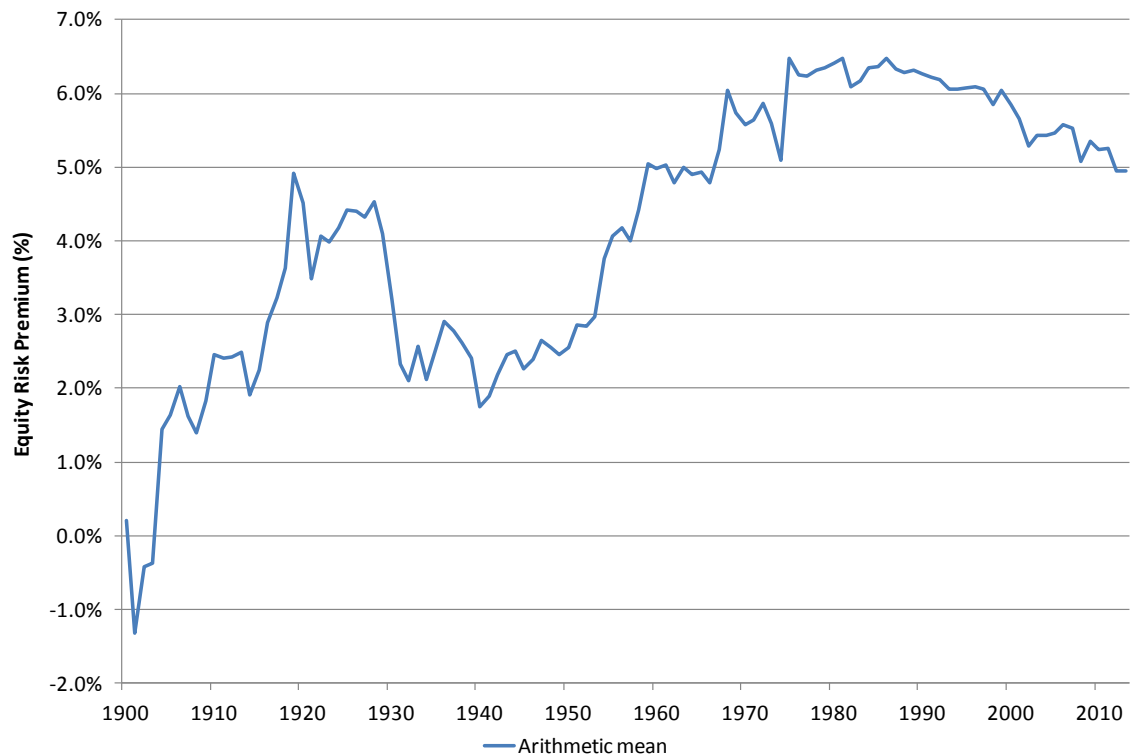
DMS also noted the following in a recent Financial Times article published in April 2013[24]:

> *"Long-term forecasts of asset returns should be realistic. The projections made by many asset managers, retail financial product providers, pension funds, endowments, regulators and governments are optimistic. Overly optimistic estimates of future returns are dangerous, not only because they mislead, but also because they can mask the need for remedial action."*

Finally, we have also considered evidence from the Barclays *2013 Equity Gilt Study*.[25] This study calculates an arithmetic mean of a 3.0% premium against the real interest rate for government debt in the UK (1900-2011) and a 4.2% premium over a shorter time period (1950-2011).

4.3.2. Regulatory precedent

The CC decision for Bristol Water of 4.0-5.0% is lowered to 3.0-5.0% if a 2.0% risk free rate is used (as per each DNO business plan). This is based on the long-term historical market return,

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[23] The high values of over 6%, however, are sometimes considered to be an overstatement based on academic evidence.

[24] Financial Times (2013) 'Lower your expectations to the new normal,' April 17 2013.

[25] Barclays (2013) Equity Gilt Study.

with the CC stating that "*the current expected return may be lower than the average expected historical return.*"[26] This would give further support to using a figure significantly below 5.0% for the ERP.

Regulators' other recent assessments of the ERP are summarised in Table 4.6 below, showing a relatively wide range of estimates, reflecting the various calculation options, time periods and sources available. Ofgem proposed a range for the ERP for RIIO GD1 and T1 of 4.75 – 5.5%, as set out below.

> '*Our preferred approach is to rely on the well-established long term ERP estimates provided by Dimson, Marsh and Staunton (DMS). … In their 2012 update, DMS estimate the ERP for the UK to be 3.6 per cent when using the geometric mean, and 5.0 per cent when relying on the arithmetic mean of the historical series. We note that there has been no consensus in the debate about which of the arithmetic mean or geometric mean is more appropriate for the purpose of setting the cost of equity in a regulatory context*'.[27]

Given the preferred approach, we think that using a figure above 5.0% would not appear consistent with such a statement.

Table 4.7: Recent regulators' assessments of the equity risk premium

Regulator	Decision	ERP (real)
Ofgem	RIIO ED1 Strategy decision (2015-2023)	4.75-5.50%
CAA*	Heathrow and Gatwick airports (2014-2019)	6.0%
ORR*	Network Rail Cost of Capital (2014-2019)	5.0%
Ofgem	RIIO-GD1 & RIIO-T1 (2013-2021)	4.75% - 5.25%
NIAUR	NIE T&D proposals (2012-2017)	4.8%
Ofcom	Mobile calls (2011-2015)	5.0%
CC	Bristol Water (2010-2015)	4.0% - 5.0%
Ofgem	Electricity distribution (2011-2015)	4.7% - 5.0%[28]
Ofwat	Water & sewerage (2010-2015)	5.4%
CAA/ CC	Stansted airport (2009-2014)	5.0%
CAA/ CC	Heathrow and Gatwick airports (2009-2014)	4.5%

Source: Regulatory determinations.

Note: CAA and ORR decisions are based on Initial Proposals. The ORR determination is for a notional Network Rail and is used for the purpose of calculating a Financial Indemnity Mechanism fee.*

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[26] Competition Commission (2010) Bristol Water Determination, Appendix N, p.25.

[27] Ofgem (2012b), op. cit., paras 2.52 – 2.55. "RIIO ED1: Consultation on strategy for the next electricity distribution price controls – RIIO ED1 – Financial issues", paras 2.49 and 2.50, accessed at http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/riio-ed1/consultations/Documents1/RIIOED1SConFinancialIssues.pdf

[28] These numbers are implied from the relevant Ofgem publication since it does not make final decisions on elements of the calculation explicit. It does, however, recommend an overall cost of equity of 6.7%.

4.3.3. Assessment

Our overall view is that an ERP assumption of 5.0% is appropriate, especially given the fall in the real risk free rate.

The lower end of any broader range would be influenced primarily by the evidence from Barclays, rather than the long term arithmetic mean figures provided by DMS. We have chosen to focus on a point estimate at the upper end of our broader range of 4.5-5.0% given the decrease in the risk free rate, thereby continuing our long term view of the combined market cost of equity (i.e. risk-free rate plus equity risk premium) of 6-7% (real).

Table 4.8: CEPA assessment of the ERP

	CEPA Estimate	
	Low	**High**
Equity risk premium	5.0%	5.0%

Source: CEPA calculations

4.4. Equity beta

In this section we provide our initial assessment of the equity beta for RIIO-ED1. To inform our view, we provide asset beta and raw equity beta analysis and compare this to a relative risk assessment and regulatory precedent on equity beta.

4.4.1. Asset beta and raw equity beta analysis

Figure 4.6 below presents the results of our asset beta analysis. These are based on raw equity beta estimates, de-levered by each company's stated annual gearing level on a market capitalisation basis.[29]

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[29] While the UK firms shown all operate on an April-March year for their reports, Iberdrola published reports on a January-December basis.

Figure 4.6: Asset betas for comparator companies
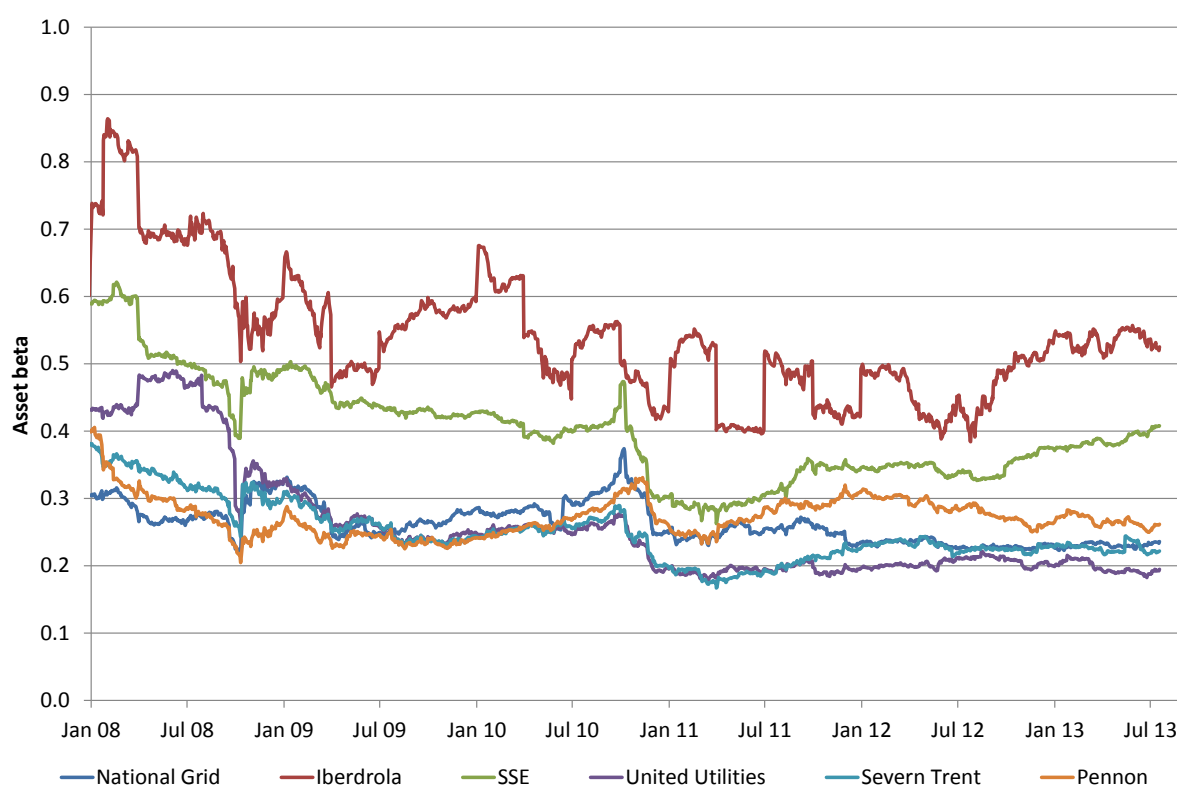
Source: Company accounts, Bloomberg, CEPA analysis.

We recognise that none of our comparators is perfect. For example, National Grid includes US and non-regulated entities alongside its gas distribution assets. Nevertheless, the data indicates an appropriate range for the asset beta of between 0.1 (based on recent data for National Grid, SSE and United Utilities) and 0.5 (based on Iberdrola[30]).

Extending the analysis in Figure 4.6, Table 4.9 summarises the averages of both asset betas and equity betas leveraged against a notional gearing assumption of 65%.

Table 4.9: Asset beta and equity beta estimates

As of 8/07/13	Asset beta w/ actual gearing		Equity beta w/ notional gearing (65%)	
Company	1yr average	5yr average	1yr average	5yr average
National Grid	0.23	0.26	0.65	0.75
Iberdrola	0.47	0.52	1.36	1.47
SSE	0.35	0.38	0.99	1.10
United Utilities	0.21	0.24	0.59	0.69
Severn	0.22	0.24	0.64	0.69
Pennon	0.27	0.27	0.77	0.76

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[30] We note that Iberdrola's asset beta may be higher due to tariff resets in Spain, as well as a less liquid national stock exchange compared to the FTSE.

Average *	0.26	0.28	0.73	0.80
As of 07/12/13 (DPCR5 decision)				
Average *	0.30	0.33	0.85	0.96

Source: Bloomberg

Note: Based on net debt/ market capitalisation + net debt

* Excluding Iberdrola

Table 4.9 suggests that current equity betas are significantly below 1.0 when you take out Iberdrola as perhaps our least relevant comparator given that it is listed on the Spanish market and only 20% of the company's EBITDA is derived from UK regulated businesses. Taking the five year average for the re-levered equity beta for our other comparators, i.e. excluding Iberdrola, the figure derived is 0.80. The market evidence observed shows a fall of up to 20% in the average asset and equity betas. If a total equity approach was used rather than a market capitalisation approach, the figure would be 0.41, less than half of the equity lower bound included in the proposed DNO business plan ranges (0.90-0.94).

4.4.2. Relative risk analysis

This section looks at how arguments based on relative risk should influence the equity beta range for RIIO-ED1. This analysis is then used as a cross-check for our quantitative analysis contained above for the equity beta. We focus on two aspects of relative risk:

- expenditure to RAV ratios; and

- changes in asset lives and the length of the price control.
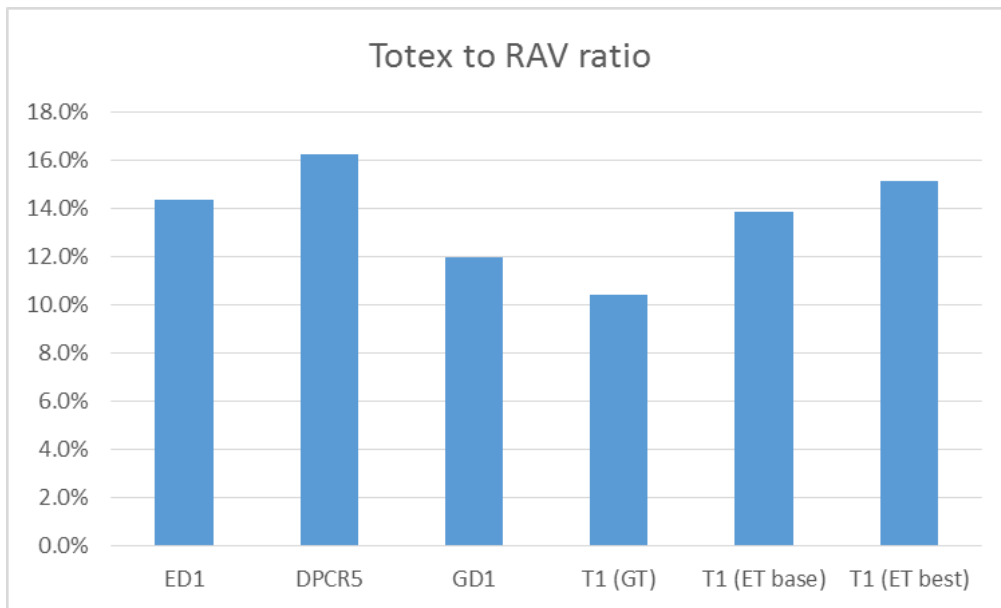
Expenditure to RAV ratios

As reflected in the recent RIIO-T1 determinations for the two Scottish transmission companies (SHETL and SPTL), the size of the expenditure programme relative to the Regulatory Asset Value (RAV) can also be seen as a significant source of systematic risk.

For the RIIO-T1 determination, the gearing level was reduced by Ofgem to 55% and a slightly higher equity beta was used for the Scottish companies compared to NGET.

The following two charts (Figures 4.7 and 4.8) show that the scale of the expenditure in the electricity distribution sector has not reached the levels projected for the electricity transmission companies' "best case" view.

It should be noted that the T1 Electricity Transmission decision (illustrated in charts) is based upon the NGET determination, with SHETL for example having a totex to RAV ratio of c. 20% on their best view case.

*Figure 4.7: Totex to RAV ratios across RIIO regimes*

Source: Business plans, Ofgem, CEPA analysis

Both totex to RAV and slow pot expenditure to RAV for the electricity distribution sector has also fallen for RIIO-ED1 (based on the DNOs' business plans) compared to DPCR5 (based on Ofgem Final Proposals).

As Figure 4.7 shows, there is a fall of totex to RAV of two percentage points for ED1 compared to the DPCR5 Final Determination. This ratio will fall further should Ofgem feel as though some of the expenditure should not be included for the price control allowance.

This would therefore suggest an equity beta at least no higher than the 0.90 used at DPCR5 should be adopted for RIIO-ED1.

Figure 4.8: Slow pot expenditure to RAV ratio across RIIO regimes
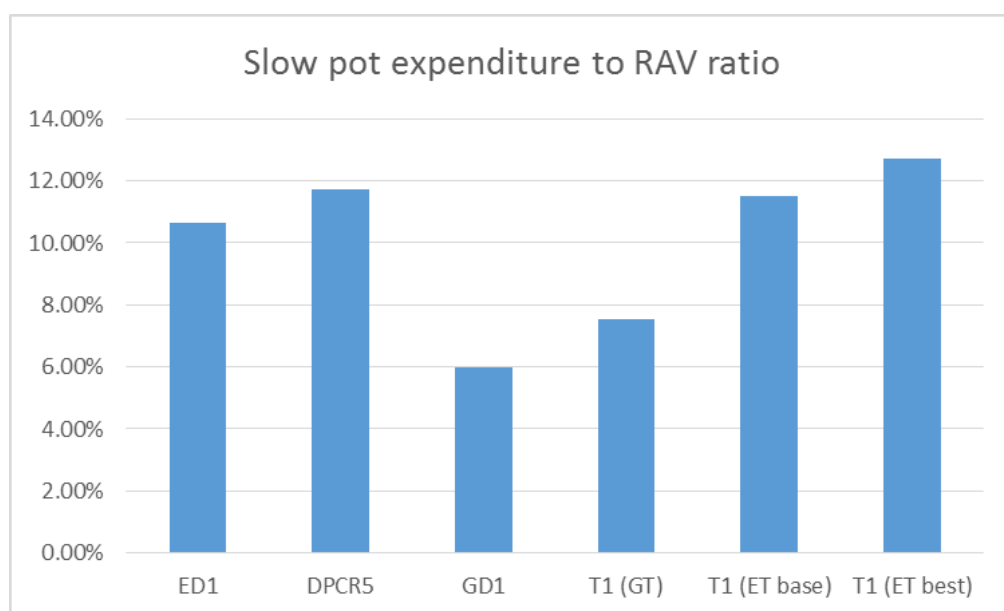
Source: Business plans, Ofgem, CEPA analysis

Changes in asset lives and length of price control

We continue to believe that an NPV neutral change in asset lives will not have a significant impact upon the equity beta, and given that the proposed change is just for new assets, any such effect would be minimal especially given a possible transition phase.

It is also our view that there is little evidence to suggest that the move to an eight year price control period will increase risk.

Conclusions

In summary, compared to DPCR5, we do not believe that there is enough evidence to depart in RIIO-ED1 from the 0.90 equity beta Ofgem used in its previous determination. However, the quantitative equity beta analysis above would suggest that the evidence which does exist, at least points towards a lower equity beta than this.

4.4.3. Assessment

The equity beta measures systematic risks and we do not think that whether a company is fast-tracked or not would change the equity beta.

As noted previously, Ofgem should be careful that they are not giving overly generous headroom for each parameter estimate, thus overcompensating the networks.

Our initial view is that an appropriate equity beta range appears to be 0.90-0.95. This is consistent with the company business plans.

Table 4.10: CEPA assessment of the equity beta

CEPA estimate	Low	High
Equity beta	0.90	0.95

Source: CEPA calculations

4.5. Regulatory precedent

Table 4.11 below summarises regulatory precedent in the UK for each cost of equity parameter value, including the risk free rate, ERP and equity beta. This shows that a combined market cost of equity (i.e. risk free rate plus ERP) above 7.0% has only been seen in the RIIO GD1/ T1 decision and the Ofwat PR09 decision. Given that our equity beta analysis points to an equity beta of below 1.0, proposals for a total cost of equity of 6.7% or above for DNOs would be towards the upper end of that suggested by regulatory precedent.

Table 4.11: UK Regulatory precedents on cost of equity

Regulator	Decision	Risk free rate	ERP	Equity beta	Risk free rate + ERP[2]	Cost of equity
Ofgem	RIIO-GD1 & RIIO-T1[1] (2013-21)	2.0%	5.25%	0.90-0.95	7.25%	6.7-7.2%
Ofcom	Mobile calls (2011-2015)	1.5%	5.0%	0.76	6.5%	5.3%
Ofgem	Electricity distribution (2011-2015)	2.0%	4.7%	1.0	6.7%	6.7%
CC	Bristol Water (2010-2015)	1.0–2.0%	4.0- 5.0%	0.64–0.92	6.0%	3.6-6.6%
Ofwat	Water & sewerage (2010-2015)	2.0%	5.4%[31]	0.9	7.4%	7.1%
NIAUR	SONI [1] (2010-2015)	N/A		0.77	N/A	5.64%
CC	Bristol Water (2010-2015)	1.0–2.0%	4.0- 5.0%	0.64–0.92	6.0%	3.6-6.6%
CAA /CC	Stansted airport (2009-2014)	2.0%	5.0%	1.12	7.0%	7.9%
CAA/CC	Heathrow airport (2009-2014)	2.5%	4.5%	1.03	7.0%	7.3%
CAA/CC	Gatwick airport (2009-2014)	2.5%	4.5%	1.15	7.0%	7.9%

Note 1: T1 decision for a 7.0% Cost of Equity

Note 2: Uses mid-points where a range is specified.

4.6. MAR analysis

The MAR is a well-established tool used by equity analysts to compare allowed and actual returns on capital. At its simplest, the concept is that in the absence of other factors a company will earn its allowed return on its RAV. In this case it would have an MAR of 1.0. In this section we investigate the scale of observed MAR values for recent transactions.

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[31] Ofwat chose an ERP at the top end of its range to account for the uncertain economic environment at the time of its determination. However, it also noted that expectations of the future ERP were lower than the historical average.

Analysis of MARs suggests that the traded values of utility companies have generally exceeded their RAVs by 10-30% since 2004 (see Figure 4.9 below).

Figure 4.9: MAR premia for recent UK utility transactions

* means the figures relate to transaction proposals only, rather than completed transactions
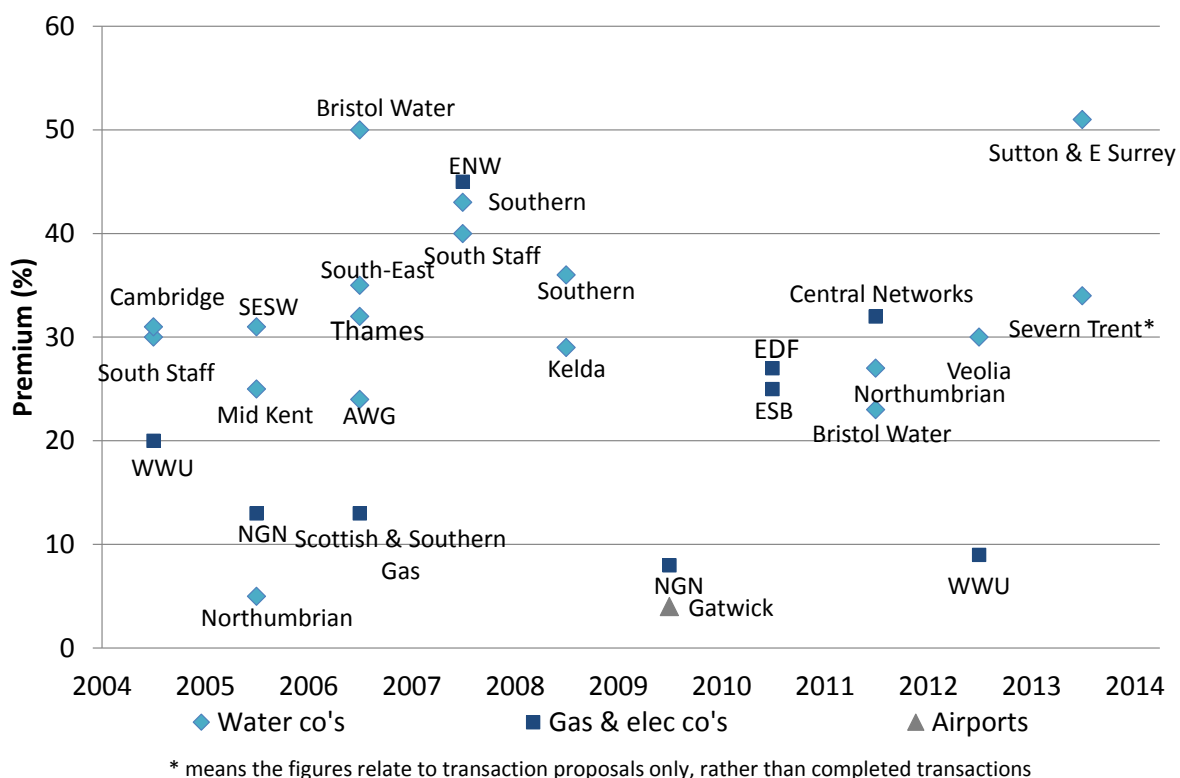
Source: CEPA analysis

We believe the evidence in Figure 4.9 provides a strong indication of outperformance against the allowed WACC, as it is highly unlikely that outperformance on incentives and cost would contribute any more than 10% of premium. The Chairman of Ofwat recently supported this position in a March 2013 lecture, stating that:

> *"The continuing trend for water companies to be sold for prices around 130% of RAV only suggests that the regulator's adopted cost of capital is too high and the premia reflect excess demand for these assets."[32]*

The MAR analysis clearly shows the continuing appetite for regulated assets, which are perceived by many investors to have bond-like characteristics and may be evidence that the cost of capital allowed by regulators has been at least sufficiently generous for regulatory determinations.

Table 4.12 below is based upon the figure above and splits the transactions by sector. Whilst it is difficult to attribute a premium to one particular area of outperformance (or expected outperformance), it is clear that electricity distribution sales have been at a significant premium to the RAV. Two of the three sales of electricity distribution networks included in this analysis took place at the start of DPCR5.

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[32] Observations on the regulation of the water sector: A lecture by Jonson Cox, Chairman of the Water Services Regulation Authority (Ofwat), 5 March 2013.

Table 4.12: MAR analysis by sector

Sector	Premium (%)
Airports	9.0%
Gas Distribution	12.6%
Electricity Distribution	34.7%
Water	20.8%

Source: CEPA analysis

4.7. Overall assessment of the cost of equity

4.7.1. Interaction with incentive mechanisms

Before discussing our overall conclusions on the cost of equity, we discuss an argument that a number of DNOs appear to make; that their proposed cost of equity is dependent on their plans being fast tracked and receiving the additional income rewards associated with this process.

They argue that they were allowed additional (positive) expected returns from Information Quality Incentive (IQI) additional income at DPCR5, on top of their headline DPCR5 cost of equity, however, this benefit will now be removed for slow-tracked DNOs given the changes Ofgem is proposing with its ED1 IQI policy.

The fast-track arrangements by contrast will maintain the existing levels of incentive rewards for DNOs with an expected boost to the available return on regulated equity of approximately 100 basis points.[33] The DNOs argue that while a headline cost of equity of 6.7% would, therefore, be consistent with being fast-tracked and DPCR5 (because of the additional income rewards available under this process) if this return is no longer achievable under the slow-track IQI process, it should be recognised instead in the baseline cost of equity.

Hence, the DNOs' argue, their proposed headline cost of equity (6.7-6.8%) is contingent on their business plans being fast-tracked.

As set out in our accompanying report on cost efficiency and expenditure[34], our interpretation of the DNOs' proposal is that they are seeking to justify their required return on equity based on maintaining the status quo (i.e. DPCR5) equity returns package, including from totex incentives, rather than evidence on their real stand-alone cost of capital.

By claiming an additional income uplift (consistent with DPCR5) must be achievable through the IQI (as is the case with the fast-track process and the DNO business plan proposals) or recognised in the baseline cost of equity, the companies are effectively arguing that the expected, normal rate of return, from electricity distribution is higher than the headline 6.7% cost of equity quoted in their plans.

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[33] Analysis of the Price Control Financial Models submitted alongside the companies' business plans shows that the additional 2.5 percent on totex (provided to a fast-track company) is forecast to provide an additional 94.5 to 116.5 bps on the RoRE. The whole-industry boost to RoRE was 106.5 bps.

[34] CEPA (2013): 'RIIO-ED1: Review of the DNOs' business plans – Cost Efficiency and Expenditure'

Our WACC calculations in contrast are based on a standalone company and are independent of returns from other mechanisms.

We do not support the view that the cost of equity should rise if a company has not been fast tracked, as at least five of the six companies have set out. Ofgem should ensure that the cost of capital parameters remain appropriate in this context.

4.7.2. CEPA's proposed cost of equity

Whilst the RIIO GD1 cost of equity final determination was 6.7%, the strategy consultation paper in March 2011 set out a cost of equity range of 4.0-7.2%. Since the time of this consultation, the lower bound of 4.0% could be even lower due to movements down in the risk free rate, whereas the market expected increases in the risk free rate at that time.

Figure 4.10 shows expectations of the risk free rate at the current point in time and at the DPCR5 decision, proxied using the nominal ten year gilt rate.

Figure 4.10: UK Nominal Gilt expectations and actuals
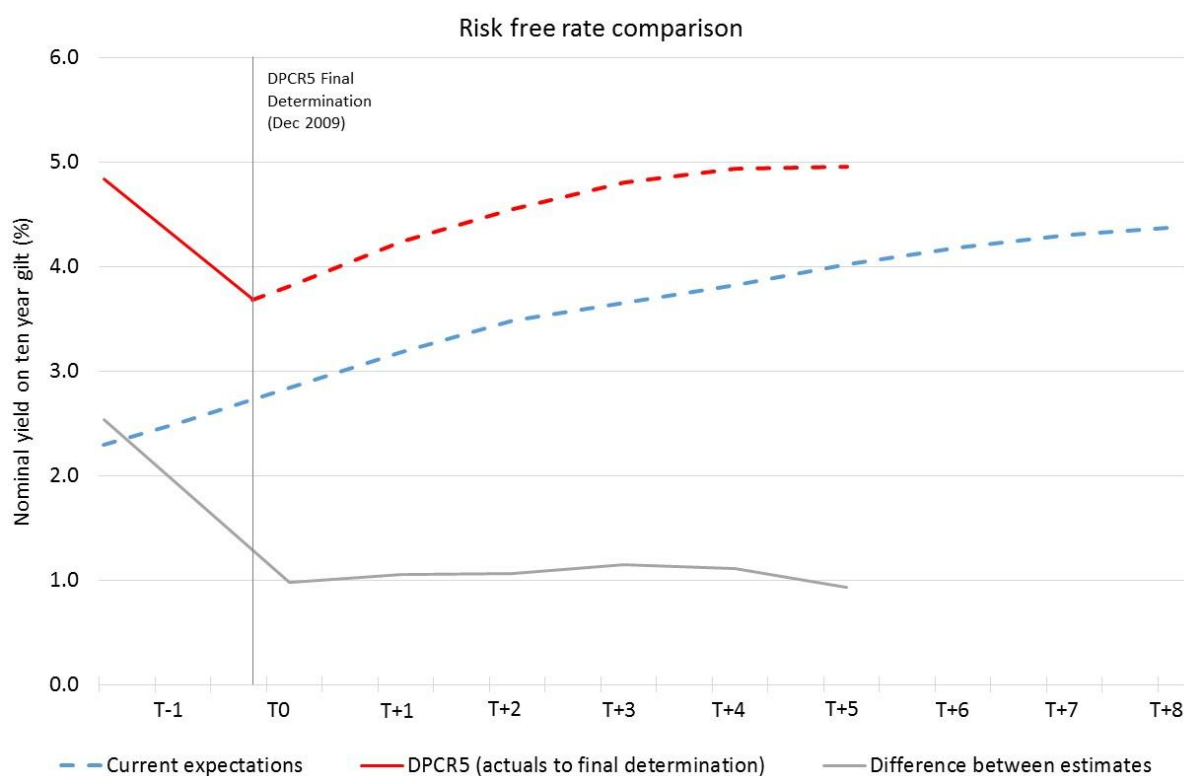
Source: Bloomberg, CEPA analysis

This analysis (in addition to evidence on the cost of equity building blocks set out above) has led us to reach an initial range for the cost of equity in RIIO-ED1 of 6.0-6.5%, which we note is below the proposals in the DNOs' business plans.

This means that any decision to fast track an electricity DNO must be very well justified, as the proposals of 6.7-6.8% on the cost of equity appear to be more than sufficient for the companies to finance themselves.

We would reiterate that this cost of equity is independent to returns from other mechanisms such as incentives and we do not believe that a company that is not fast tracked should receive a higher cost of capital. For both fast-tracked and non-fast tracked companies, we would see the post-tax cost of equity as being 6.0-6.5%.