Oxera

RIIO-ED1 consultation on strategy

Financial issues

Prepared for
Energy Networks Association

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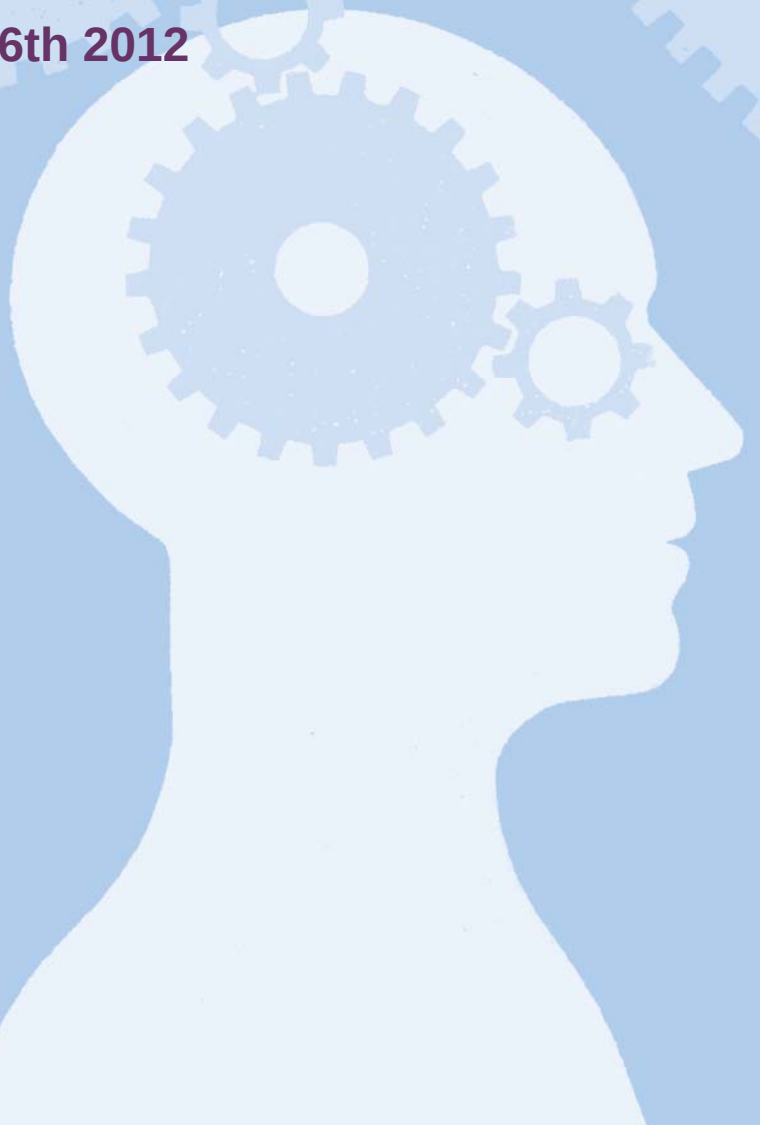

Executive summary

This report was commissioned by the Energy Networks Association as a response to the consultation on the strategy for the next electricity distribution price control (RIIO-ED1).[1]

The strategy consultation sets out Ofgem's proposed framework for determining efficient financing costs in RIIO-ED1. The key proposals in relation to the allowed return include:

– an initial cost of equity range of 6.0–7.2% based primarily on evidence from the CAPM;
– a cost of debt allowance updated annually based on movements in the simple ten-year trailing average of Ofgem's measure for the market cost of debt.

The proposals are largely identical to the strategy decision for the ongoing transmission and gas distribution price control reviews (RIIO-T1 and GD1 respectively). Ahead of the strategy consultation, Oxera produced a report on behalf of the Energy Networks Association which suggested how the RIIO-T1 and GD1 approach could be refined for RIIO-ED1.[2] This response complements the September report by considering some specific areas of Ofgem's strategy consultation.

Cost of equity

The proposed initial cost of equity range of 6.0–7.2% is the same as the cost of equity range in the RIIO-T1/GD1 strategy decision.

– Considering the overlap between RIIO-ED1 and RIIO-T1/GD1, to ensure consistent investment and consumption choices across the energy networks, using the same cost of equity range as in RIIO-T1/GD1 is appropriate.

– The proposed ranges for the risk-free rate and the equity risk premium (ERP), of 1.7–2.0% and 4.75–5.5% respectively, reflect a longer-term view of capital market data, which is appropriate, given a move to a longer price control and challenges in interpreting current market data. Estimates towards the upper end of the proposed ranges are broadly consistent with recent regulatory precedent.

The precise number for the allowed return on equity for each individual DNO will depend on the details of their business plans. However, the proposed values for the risk-free rate and the ERP in the RIIO-T1/GD1 Initial Proposals, the settlement for the last distribution price control (DPCR5), and initial evidence that risk is likely to be higher in RIIO-ED1 than in DPCR5,[3] suggest that point estimates higher than 6.7% are likely to be more plausible.

Cost of debt

To ensure that efficient debt costs are recoverable in RIIO-ED1, it is important to analyse the impact of Ofgem's debt indexation proposals on risk and financeability taking into account the specific characteristics of the electricity distribution sector.

The strategy consultation carries over the same debt indexation assumptions from RIIO-T1/GD1 to RIIO-ED1 without providing any DNO-specific analysis. In addition, as outlined in

[1] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th.
[2] Oxera (2012), 'Determining efficient financing costs for RIIO-ED1', prepared for the Energy Networks Association, September 3rd.
[3] Ibid.

Oxera's September report, a number of issues with the approach used in RIIO-T1/GD1 remain outstanding and are just as valid in the context of RIIO-ED1.

A review of the arguments put forward in the strategy consultation to address some of these issues suggests that there are still a number of shortcomings with the proposed approach for remunerating debt costs. It is recommended that these issues be given further consideration ahead of the RIIO-ED1 strategy decision.

- **Compensation for residual cost of debt risk**. The principle behind debt indexation is to reduce the risk of error in the estimate of the cost of debt, and hence reduce the need to provide a margin ('headroom') in the cost of debt allowance by setting it above the central estimate of the efficient cost of debt, inclusive of debt issuance costs. Ofgem proposes to remove this margin completely under indexation, notwithstanding the fact that the risk of error will not reduce to zero, and in some cases will not reduce materially compared with a fixed cost of debt allowance.
  - All companies will be exposed to risk due to both intra-year volatility in yields and a time-varying inflation risk premium.
  - For an average DNO, debt indexation leads to only a modest reduction in risk compared with a fixed cost of debt allowance, since only a small proportion of the existing debt needs refinancing in RIIO-ED1. For a number of companies with very low refinancing needs, debt indexation may actually increase risk.
- **Risk of under-recovery of efficiently incurred debt costs**. Given the historical downward trend in the cost of debt and current low levels of yields, there is a material risk of under-recovery of efficiently incurred debt costs in RIIO-ED1. While the risk of divergence between the existing and allowed costs of debt is present in all price controls, in previous price controls companies were compensated for this risk of divergence through a margin in the allowed cost of debt. In addition, the proposed design of the index, combined with the current market environment, leads to a higher probability of under-recovery than in previous price controls.
- **Allowance for debt issuance costs**. To ensure that efficient debt costs, including debt issuance costs, are recoverable regardless of the market conditions or other unforeseen circumstances (such as the impact of Solvency II and changes in the index composition), a separate allowance for debt issuance costs would be more appropriate than the current proposals.

Ofgem's duty to allow companies to finance their functions suggests that the above factors cannot be disregarded. It is important that the debt indexation proposals appropriately reflect the risk of error between the allowed and actual cost of debt and provide adequate protection against under-recovery of efficiently incurred debt costs, inclusive of debt issuance costs. This can be achieved either by providing a suitable margin in the allowed return (on either debt or equity) or, where appropriate, by modifying the debt index or supplementing it with a mechanism to avoid undue exposure to risk.

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1 Introduction

This report was commissioned by the Energy Networks Association as a response to the consultation on the strategy for the next electricity distribution price control (RIIO-ED1).[4]

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– an initial cost of equity range of 6.0–7.2% based primarily on evidence from the CAPM;
– a cost of debt allowance updated annually based on movements in the simple ten-year trailing average of Ofgem's measure for the market cost of debt.

The proposals are largely identical to the strategy decision for the ongoing transmission and gas distribution price control reviews (RIIO-T1 and GD1 respectively). Ahead of the strategy consultation, Oxera produced a report on behalf of the Energy Networks Association which suggested how the RIIO-T1 and GD1 approach could be refined for RIIO-ED1.[5] This response complements the September report by considering some specific areas of Ofgem's strategy consultation.

The rest of this report is structured as follows:

– section 2 comments on the proposed initial range for the cost of equity, with a focus on the risk-free rate and the equity risk premium (ERP) parameters;
– section 3 discusses the debt indexation proposals.

[4] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th.
[5] Oxera (2012), 'Determining efficient financing costs for RIIO-ED1', prepared for the Energy Networks Association, September 3rd.

2 Cost of equity

In the strategy consultation Ofgem proposes an initial cost of equity range of 6.0–7.2%. This range is derived using a CAPM-based approach: 'ie looking at each of the components of the cost of equity'—the risk-free rate, ERP and the equity beta.[6]

The proposed cost of equity range is the same as the cost of equity range in the RIIO-T1/GD1 strategy decision.

– Considering the overlap between RIIO-ED1 and RIIO-T1/GD1, to ensure consistent investment and consumption choices across the energy networks, using the same range as in RIIO-T1/GD1 is appropriate.

– The proposed ranges for the risk-free rate and the ERP, of 1.7–2.0% and 4.75—5.5% respectively, reflect a longer-term view of capital market data, which is appropriate, given a move to a longer price control period and challenges in interpreting current market data. Estimates towards the upper end of the proposed ranges are broadly consistent with recent regulatory precedent.

The precise number for the allowed return on equity for each individual DNO will depend on the details of their business plans. However, the proposed values for the risk-free rate and the ERP in the RIIO-T1/GD1 Initial Proposals, the settlement from the last electricity price control (DPCR5), and initial evidence that risk is likely to be higher in RIIO-ED1 than in DPCR5,[7] suggest that point estimates higher than 6.7% are likely to be more plausible.

2.1 Overall approach to market parameters

It is unusually difficult to apply the CAPM to current capital market data. A number of factors contribute to this:

– the aftermath of the most severe financial crisis in recent decades, with capital markets continuing to go through periods of high volatility;
– loose monetary policy on an unprecedented scale, including several rounds of quantitative easing (QE) by the Bank of England;
– increased uncertainty around key economic fundamentals, such as output and inflation;
– continuing concerns about the fiscal sustainability of a number of governments around the world, particularly in the eurozone;
– changes in the regulation and investment strategies of financial institutions, such as the impact of pension fund investment on index-linked gilt yields.

These factors have led to a marked divergence between short-term estimates of the CAPM market parameters—namely, the risk-free rate and the ERP—and longer-term estimates. This means that interpreting current market evidence is very challenging, especially in a context where the regulator needs to forecast a cost of equity for the duration of the 8-year price control.

[6] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.35.
[7] Oxera (2012), op. cit.

In the strategy consultation, Ofgem proposes an initial cost of equity range of 6.0–7.2% (Table 2.1). This is the same as the ranges initially proposed in the RIIO-T1/GD1 strategy decision.[8]

Table 2.1 Initial range for the cost of equity

Component	RIIO-ED1	RIIO-GD1	RIIO-T1 (Gas)	RIIO-T1 (Electricity)	DPCR5
Risk-free rate (%)	1.7–2.0	2.0	2.0	2.0	2.0
ERP (%)	4.75–5.5	5.25	5.25	5.25	5.25
Equity beta	0.90–0.95	0.90	0.91	0.95	0.90
Cost of equity (post-tax) (%)	**6.0–7.2**	**6.7**	**6.8**	**7.0**	**6.7**

Note: The values for RIIO-GD1 and RIIO-T1 are based on Initial Proposals.
Source: Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, Figure 2.7, p. 20.

As RIIO-ED1 substantially overlaps with the RIIO-T1/GD1 price controls, ensuring that investment and consumption choices are not distorted across different forms of energy and parts of the value chain requires the financial parameters for the different price controls to be determined using similar fundamental assumptions. Therefore, it seems appropriate to use the same initial range for the cost of equity at this stage in the process.

Ofgem is not constrained to update its parameters mechanically to account for any market developments between the strategy consultation and the strategy decision. Given that the start of the price control is more than two years away, very short-run market movements are unlikely to provide much new guidance on what the allowed return on equity should be for an eight-year period from April 2015.

Although the precise cost of equity for individual DNOs will depend on the details of their business plans, the RIIO-T1/GD1 Initial Proposals use a risk-free rate and ERP estimate of 2.0% and 5.25% respectively—which is the same as for DPCR5 (Table 2.1). Ensuring consistent signals for investment and consumption across the energy sectors suggests that it would be appropriate to use market parameters for RIIO-ED1 similar to RIIO-T1/GD1. Furthermore, initial assessment suggests that risk for RIIO-ED1 is likely to be higher than for DPCR5.[9] Therefore, in practice, while the overall proposed range is likely to capture reasonable estimates of the allowed return on equity for RIIO-ED1, point estimates higher than 6.7% are likely to be more plausible.

2.2 Risk-free rate

The risk-free rate range proposed in the strategy consultation is higher than spot yields on index-linked gilts. In the regulatory context, it is appropriate to set the regulatory allowance for the risk-free rate higher than the spot yield in order to reflect uncertainty over future levels of the risk-free rate, and hence the required return on equity.

– This can be viewed as the 'insurance premium' that a company requires for bearing the risk of a variable cost of equity relative to a fixed allowance.

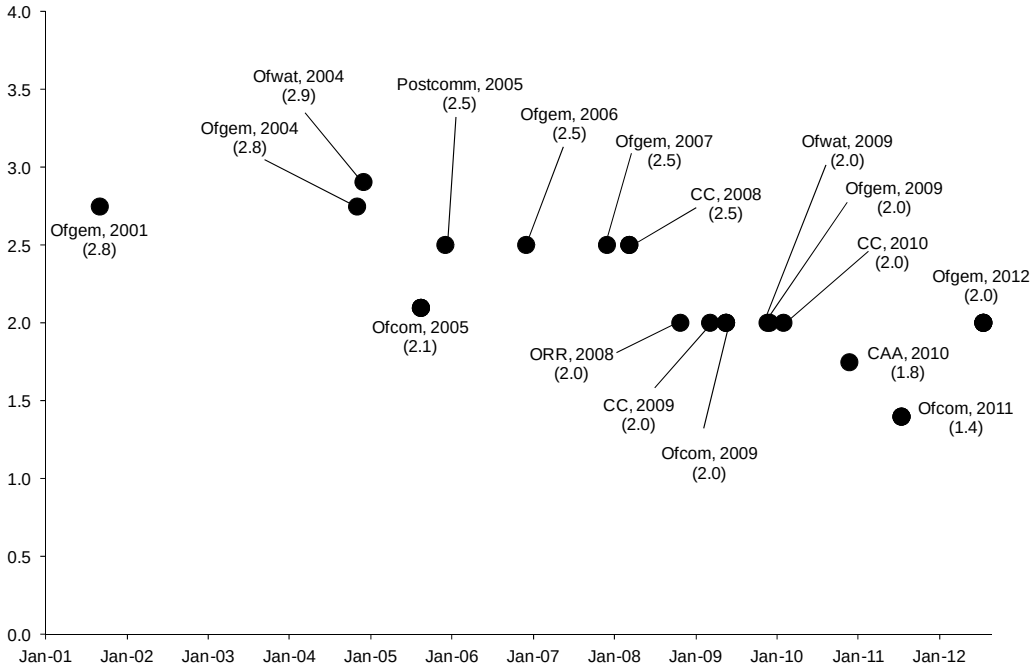
– Additionally, setting the regulatory allowance above the spot yield can reflect a view that the costs of overestimating the risk-free rate (and hence overcharging consumers) are smaller than the costs of underestimation (creating an underinvestment problem).

[8] Ofgem (2011), 'Decision on strategy for the next transmission and gas distribution price controls—RIIO-T1 and GD1 Financial issues', March 31st.
[9] Oxera (2012), op. cit. The Energy Networks Association is undertaking further work on developing a common risk assessment framework.

As shown in Figure 2.1, a risk-free rate range of 1.7–2.0% is generally in line with recent regulatory precedent. In fact, most regulators (with the exception of Ofcom) have adopted values closer to 2%.

Regulators have typically looked beyond short-term market fluctuations in order to achieve a degree of regulatory consistency across price reviews and ensure that their decisions are not unduly influenced by very short-term market movements. This is prudent, especially when faced with unusual market conditions, such as those that have prevailed since the start of the financial crisis in 2007.

Figure 2.1 Real risk-free rate regulatory determinations



Note: CC, Competition Commission. To facilitate comparability of regulatory precedents across parameters, in determinations where a nominal rate of return is applied, as in telecoms, a real risk-free rate was estimated using inflation assumptions.
Source: Regulatory determinations and Oxera analysis.

The only regulator recently to adopt a risk-free rate materially below 2% is Ofcom.[10] However, the relevance of its decision in the current context is limited by the following factors.

– Ofcom's determination applies to a three-year rather than an eight-year price control period, suggesting that the risk of error in the cost of capital estimate is significantly lower.

– Unlike other regulators, Ofcom does not have an explicit financing duty,[11] suggesting that the risk of underinvestment might play a slightly lesser role in setting the financial parameters of a price control.

For RIIO-ED1, it is appropriate to set the regulatory allowance for the risk-free rate higher relative to spot yields than in the past.

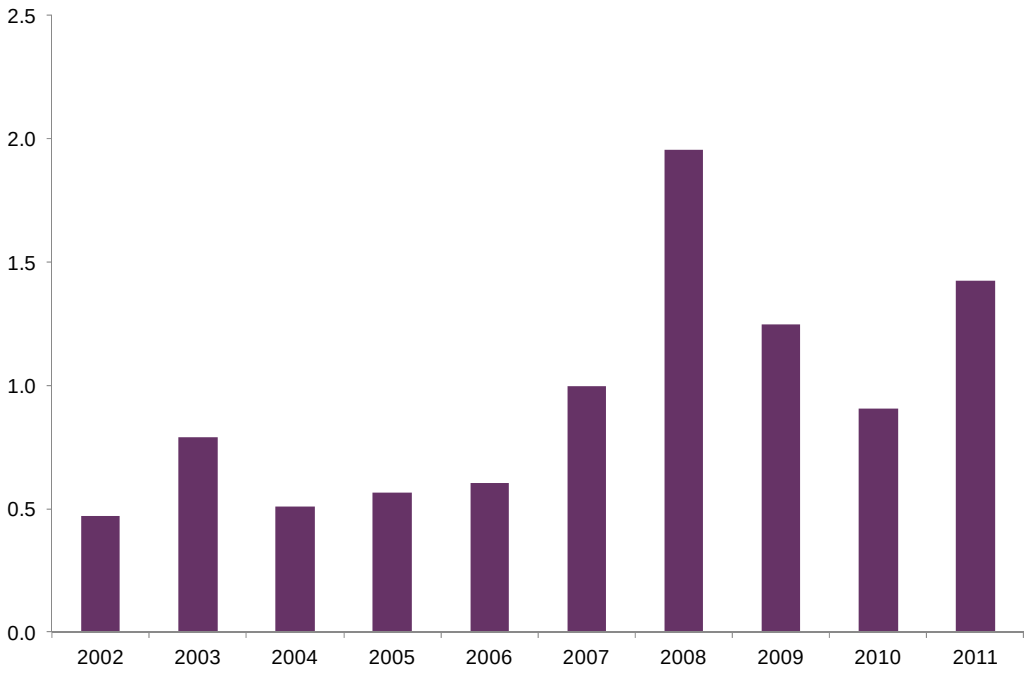
[10] Since the RIIO-T1 and GD1 strategy decision, Ofcom has made two risk-free rate determinations: one in July 2011 and one in April 2012. The decision in April 2012 was based on the value used in July 2011 and did not consider new evidence since that decision. Ofcom (2011), 'WBA charge control. Charge control framework for WBA Market 1 services', July; Ofcom (2012), 'Wholesale ISDN30 Price Control', April.
[11] Communications Act 2003, Section 3(1).

– A move from a five- to an eight-year price control period exposes companies to greater capital market uncertainty than in previous controls and in comparison to other sectors.

– Measures of the risk-free rate continue to be more volatile in the context of elevated capital market uncertainty than in the past (see Figure 2.2 below).

– Spot yields are at historically low levels, suggesting that the potential for further declines is limited, whereas there is potential for large increases.

Figure 2.2 Difference between maximum and minimum of daily ten-year index-linked gilt yield by calendar year (%)



Source: Datastream, Oxera.

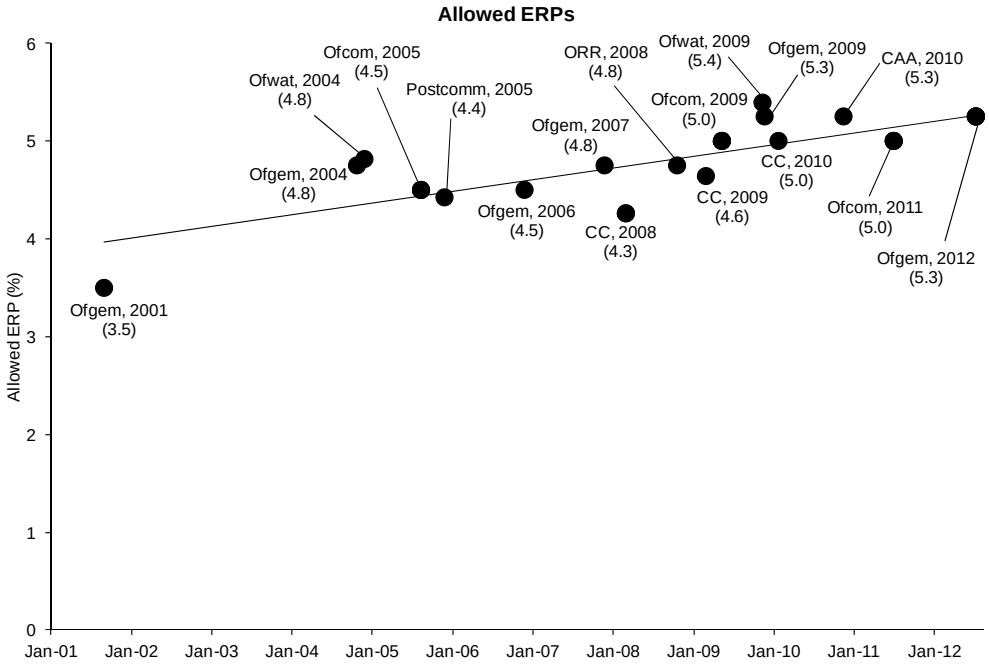
The higher probability of interest rates increasing, rather decreasing, appears to be acknowledged by Ofgem, and is indeed reflected in its choice of an upper bound for the risk-free rate range of 2%.[12] This is a reasonable approach in the current context.

2.3 Equity risk premium

The ERP is not directly observable, and setting a regulatory allowance for the ERP also requires a degree of judgement. Estimates of the ERP towards the upper end of Ofgem's proposed range of 4.75–5.5% are generally in line with recent regulatory precedent. As shown in Figure 2.3, regulatory determinations for the ERP have generally followed an upward trend in recent years, partially to reflect the impact of the financial crisis.

[12] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.50.

Figure 2.3 ERP regulatory determinations

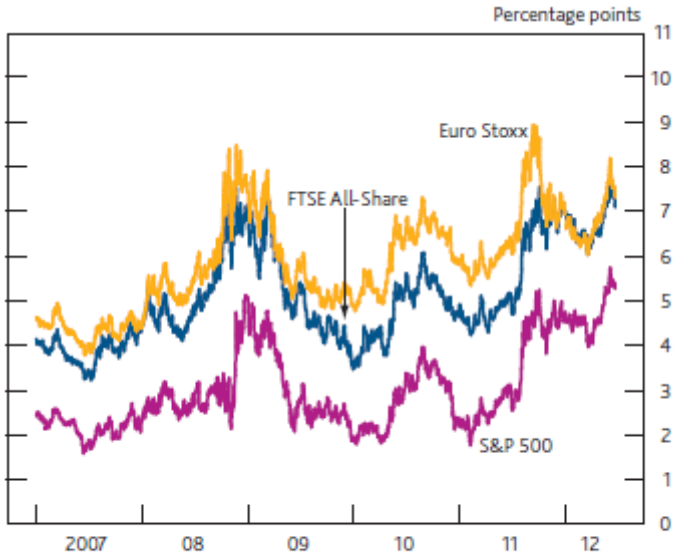


Source: Various regulatory determinations.

Based on forward-looking measures of the ERP (see Figure 2.4 below), an allowance higher than 5.25% could be supported. The estimates of the ERP produced by the Bank of England have:

– trended upwards since 2007;
– stabilised at about 7% in the past 18 months;
– risen above 7% on three occasions in the past five years.

Figure 2.4 Bank of England estimates of the ERP



Source: Bank of England (2012), 'Financial Stability Report', p. 10, Chart 1.11, June.

Similarly, forward-looking estimates of the ERP produced by Deutsche Bank as at the end of August 2012 are above 8%—notably higher than DMS estimates.[13]

In other words, an ERP range of 4.75–5.5% is considerably lower than most recent forward-looking estimates. However, this is consistent with Ofgem's approach of taking a longer-term view of the risk-free rate. Taking into account the trend of recent regulatory determinations, estimates near the upper end of the 4.75–5.5% range appear appropriate.

2.4 Equity beta

A detailed review of Ofgem's equity beta assumptions is outside the scope of this response. At this stage, this response covers two specific areas of risk assessment in the strategy consultation: the impact of higher cash-flow duration, and the overall framework for assessing risk.

2.4.1 Duration of cash flows

One specific factor that could affect business risk in RIIO-ED1, and which is discussed in the strategy consultation, is the increase in the duration of cash flows following Ofgem's decision to increase regulatory asset lives for new assets in electricity distribution. The strategy consultation suggests that this is unlikely to be a material factor in setting the cost of equity for RIIO-ED1, largely on the basis of evidence produced previously by Europe Economics.[14]

Oxera has previously explained the theoretical relationship between cash-flow duration and required returns, drawing on established principles from the finance literature, and why in the case of regulated utilities the required return is likely to increase if cash-flow duration increases.[15] In simple terms, the 'duration effect' can be broken down into two parts: the impact of duration on the sensitivity of expected returns to the real risk-free rate (the 'term premium' effect); and the impact of duration on the sensitivity of expected returns to the Sharpe ratio (the 'beta' effect). The duration effect is unlikely to be picked up by the standard CAPM, which is a one-period model that assumes no variation over time in either the real risk-free rate or the ERP.

An approximation of the net impact of the term premium component on the overall weighted average cost of capital (WACC) for a regulated energy network can be given by considering the impact for a 100% equity-financed company. On this basis, the impact on the cost of capital would be to increase the risk-free rate by the term premium and decrease the risk premium by the product of the term premium and the asset beta. For the UK, using a proxy for the term premium based on the difference between realised returns on long-maturity government bonds compared with short-maturity bonds over the period 1900–2011 gives an estimate of 1.2% for the term premium.[16] Assuming an asset beta of 0.4, an effect of the term premium on the cost of capital (and both the costs of debt and equity) of the order of 70bp would be expected.

In the ICAPM adopted by Brennan and Xia (2006), hereafter the 'BX framework', higher duration increases not only the sensitivity of the asset value to changes in interest rates, but also the sensitivity to the Sharpe ratio.[17] As duration increases, for some assets the greater sensitivity to changes in the risk-free rate (the term premium effect) may be offset by the greater sensitivity to changes in the Sharpe ratio. As a result, although in the BX framework

[13] Deutsche Bank (2012), 'LT Asset Return Study, A Journey into the Unknown', September, p. 46. The ERP estimates in this study are derived by subtracting the 10-year government bond yield from the inverse of the price–earnings ratio.

[14] Europe Economics ((2010), 'The Weighted Average Cost of Capital for Ofgem's Future Price Control—Final Phase 1 Report', December.

[15] Oxera (2010), 'What is the impact of financeability on the cost of capital and gearing capacity', prepared for the Energy Networks Association, June 9th.

[16] Dimson, E., Marsh, P. and Staunton, M. (2012), 'Credit Suisse Global Investment Returns Sourcebook 2012', February.

[17] Brennan, M. and Xia, Y. (2006), 'Risk and Valuation under an Intertemporal Capital Asset Pricing Model', *Journal of Business*, **79**:1.

the security beta increases with duration, the instantaneous expected return may increase or decrease.[18]

Brennan and Xia state that expected returns are more likely to increase with duration for assets where the systematic risk of the cash flows (the cash-flow beta) is lower. In particular, the BX framework implies that expected excess returns increase with duration for cash-flow betas of less than 0.5.

For regulated energy networks, cash flows in any given year would be expected to be relatively insensitive to returns on the market portfolio in that year. Moreover, Oxera conducted empirical analysis of UK companies, which indicated that cash-flow betas for National Grid and Scottish and Southern Energy are comfortably in the range where expected excess returns will increase with duration.[19]

The analysis provided by Oxera adds to a substantial body of empirical evidence in the existing academic literature. When considered against the narrow body of evidence presented by Ofgem's advisers based on a very small number of data points, it is difficult to see why this evidence is given greater weight by Ofgem. There remain strong grounds to believe that an increase in the duration of cash flows for regulated energy networks will lead to a material increase in the cost of capital.

2.4.2 Overall framework

As explained in Oxera's September report in detail, assessing business risk is most transparent and reliable when undertaken at the level of the asset beta. A change in business risk may translate into a change in asset beta and the weighted average cost of capital (WACC)—ie, a change in the costs of both debt and equity. Any changes in business risk need to be translated into changes in the asset beta. The gearing ratio can also be adjusted to reflect changes in business risk, but this is of secondary importance and reflects a transfer of risk between debt and equity.

Therefore, it is recommended that the assumptions around the underlying asset beta are made more transparent in the strategy decision.

[18] Ibid., p. 18.

[19] Oxera (2011), 'The impact of longer asset lives on the cost of equity: estimating cash flow betas', prepared for the Energy Networks Association, July.

3 Cost of debt

The strategy consultation proposes that the allowance for the cost of debt will be updated annually based on movements in the simple ten-year trailing average of Ofgem's chosen measure for the market cost of debt. Ofgem proposes to keep the practical calculation of the allowance the same as is currently proposed for RIIO-T1/GD1.[20]

To ensure that efficient debt costs are recoverable in RIIO-ED1, it is important to analyse the impact of Ofgem's debt indexation proposals on risk and financeability taking into account the specific characteristics of the electricity distribution sector.

The strategy consultation carries over the same debt indexation assumptions from RIIO-T1/GD1 to RIIO-ED1 without providing any DNO-specific analysis. In addition, as outlined in Oxera's September report, a number of issues with the approach used in RIIO-T1/GD1 remain outstanding and are just as valid in the context of RIIO-ED1.

A review of the arguments put forward in the strategy consultation to address some of these issues suggests that there are still a number of shortcomings with the proposed approach for remunerating debt costs. It is recommended that these issues be given further consideration ahead of the RIIO-ED1 strategy decision.

- **Compensation for residual cost of debt risk**. The principle behind debt indexation is to reduce the risk of error in the estimate of the cost of debt, and hence reduce the need to provide a margin ('headroom') in the cost of debt allowance by setting it above the central estimate of the efficient cost of debt, inclusive of debt issuance costs. Ofgem proposes to remove this margin completely under indexation, notwithstanding the fact that the risk of error will not reduce to zero, and in some cases will not reduce materially compared with a fixed cost of debt allowance.
    - All companies will be exposed to risk due both to intra-year volatility in yields and to a time-varying inflation risk premium.
    - For an average DNO, debt indexation leads to only a modest reduction in risk compared with a fixed cost of debt allowance, since only a small proportion of the existing debt needs refinancing in RIIO-ED1. For a number of companies with very low refinancing needs, debt indexation may actually increase risk.
- **Risk of under-recovery of efficiently incurred debt costs**. Given the historical downward trend in the cost of debt and current low levels of yields, there is a material risk of under-recovery of efficiently incurred debt costs in RIIO-ED1. While the risk of divergence between the existing and allowed costs of debt is present in all price controls, in previous price controls companies were compensated for this risk of divergence through a margin in the allowed cost of debt. In addition, the proposed design of the index, combined with current market environment, leads to a higher probability of under-recovery than in previous price controls.
- **Allowance for debt issuance costs**. To ensure that efficient debt costs, including debt issuance costs, are recoverable regardless of the market conditions or other unforeseen circumstances (such as the impact of Solvency II and changes in the index

[20] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.21.

composition), a separate allowance for debt issuance costs would be more appropriate than the current proposals.

Ofgem's duty to allow companies to finance their functions suggests that the above factors cannot be disregarded. It is important that the debt indexation proposals appropriately reflect the risk of error between the allowed and actual cost of debt, and provide adequate protection against under-recovery of efficiently incurred debt costs, inclusive of debt issuance costs. This can be achieved either by providing a suitable margin in the allowed return (on either debt or equity) or, where appropriate, by modifying the debt index or supplementing it with a mechanism to avoid undue exposure to risk.

3.1 Impact on risk

As in RIIO-T1/GD1, Ofgem suggests that debt indexation ensures that efficient debt costs will be recoverable. This therefore removes the need to set the cost of debt allowance above the central estimate of the efficient cost of debt (ie, it removes the need for headroom).[21]

> Setting the cost of debt component of the allowed return in such a way should provide comfort to the DNOs and their investors that efficiently incurred new debt – even at levels higher than the cost of debt assumption at the time – will be fully funded in the future. For consumers, this approach provides assurance that they will only pay for efficient debt costs, and that no "headroom" would be built into the price control package.

The conclusion that the margin (headroom) in the cost of debt allowance can be completely removed is appropriate only if companies no longer bear cost of debt risk under debt indexation—ie, the indexed allowance is a perfect match for the average efficient cost of debt of a typical network in all scenarios. However, for a typical company, debt indexation will not result in a perfect match between the allowance and its efficiently incurred cost of debt. Ofgem and its advisers acknowledged this as part of the RIIO-T1/GD1 review.[22]

In the RIIO-T1/GD1 Initial Proposals Ofgem noted several factors that influence the extent to which the indexed allowance reflects the actual cost of debt of a typical energy network. These factors include the timing and frequency of debt issuance, the coupon on the bonds relative to the market cost of debt, average maturity, and the credit rating.[23] Most of these factors are largely outside a company's control as they reflect the company's CAPEX needs, size, nature of the assets and conditions in the capital markets. The differences between the indexed allowance and actual debt costs would not be expected to be eliminated over time. It is therefore not clear why a move to debt indexation eliminates the need for any compensation for bearing residual cost of debt risk.

A number of industry-wide and company-specific factors will affect how exposure to residual cost of debt risk changes under indexation compared with a fixed cost of debt allowance. To fully understand the implications of debt indexation on risk requires a more in-depth analysis of a typical DNO debt profile.

3.1.1 Industry-wide factors

First, as no company issues debt on a frequent and uniform basis, all companies are exposed to the risk that their issuance yields differ from the average of daily yields that goes into Ofgem's calculation of the ten-year trailing average.

[21] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.10.

[22] FTI Consulting (2012), 'Cost of capital study for the RIIO-T1and GD1 price controls', July 24th, para 8.27.

[23] Ofgem (2012), 'RIIO-T1: Initial Proposals for National Grid Electricity Transmission plc and National Grid gas plc', finance supporting document, July 27th, p. 21; and Ofgem (2012), 'RIIO-GD1: Initial Proposals', finance and uncertainty supporting document, July 27th, p. 19.

The cost of debt allowance is effectively set based on the ten-year average of annual averages of daily yields. On any particular day of the year, the value of the index can exceed the annual average of yields for that year. Assuming no outperformance relative to the market cost of debt, even if companies issue debt more frequently than once a year, there is still a reasonable likelihood that the average cost of new debt issued in that year exceeds the annual average.

If the historical level of intra-year volatility in yields persists or increases,[24] all companies will still have significant exposure to the risk that their actual cost of debt deviates from the regulatory allowance. Previous Oxera analysis has shown that this factor alone leaves a typical company with a residual cost of debt risk of 30% compared with a fixed cost of debt allowance.[25]

Second, as no company issues all debt in an inflation-linked form, all companies have to issue some proportion of their debt in nominal form. Companies compensate their nominal bond investors by paying a yield that includes the real yield, expected inflation, and the inflation risk premium. Ofgem's debt index calculates a real cost of debt by subtracting an estimate of UK break-even inflation from nominal corporate bond yields.[26] As this estimate of break-even inflation will also include any inflation risk premium, this approach will not remunerate companies for the inflation risk premium due to nominal bond investors.

In the strategy consultation Ofgem suggests that 'the inflation risk premium is countered by other factors of a similar magnitude, such as a liquidity premium on index-linked gilts',[27] and that consequently no adjustments to the index are required.

Ofgem's advisers reviewed the recent evidence on the inflation risk premium (that acts to increase yields on nominal bonds relative to equivalent inflation-linked bonds) and also the liquidity risk premium (that acts to increase yields on inflation-linked bonds relative to equivalent nominal bonds). This evidence suggests that it is far from clear that the two would offset each other.

> We find that there is enough evidence to presume the existence of an inflation risk premium and the possible existence of a liquidity risk premium. These premia will both impact Ofgem's calculated inflation estimate but with one offsetting (to a greater or lesser extent) the other's effect. The net effect of the two premia is unclear. Although it seems likely that the inflation risk premium is larger than the liquidity premium.[28]

Importantly, the relative sizes of the inflation and liquidity risk premia are likely to change over time. Companies are therefore exposed to the risk that the inflation risk premium is unusually large on the dates when the company issues debt, and that the debt index will not remunerate companies for an efficiently incurred component of their nominal debt costs.

It is important that the allowed returns for all companies appropriately reflect the risk due both to intra-year volatility in yields and to a time-varying inflation risk premium.

3.1.2 Company-specific factors

The change in exposure to residual cost of debt risk under debt indexation will vary by company depending on the refinancing profile and projected RAV growth for each individual DNO.

[24] See Figure 2.2.

[25] Oxera (2012), op. cit., p. 21.

[26] The estimate of break-even inflation is derived from applying the Fisher relationship to nominal and inflation-linked government bond yields. The Fisher equation links nominal and inflation-linked yields in the following way: (1+nominal yield)=(1+inflation-linked yield)*(1+break-even inflation rate)

[27] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.27.

[28] FTI Consulting (2012), op. cit., para 11.23.

Previous Oxera analysis has shown that, assuming that RIIO-ED1 industry RAV growth is broadly similar to DPCR5, on average for the industry, debt indexation leads to a modest reduction (of around 20%) in the residual exposure to cost of debt risk compared with a fixed allowance. This is largely explained by the fact that only a relatively small proportion of existing debt needs refinancing in RIIO-ED1 (24%).[29] In fact, six of the 14 DNOs will not need to refinance any of their existing debt in RIIO-ED1,[30] which means that debt indexation is likely to increase rather than reduce their exposure to cost of debt risk. This is because their actual costs of debt will be largely fixed for the duration of the price control period while they will be exposed to a time-varying cost of debt allowance, increasing the uncertainty around the difference between the actual and the allowed costs of debt.

Network companies raise debt on terms that are largely driven by the state of capital markets at the time, and in the past have typically raised long-term debt to reflect the nature of their assets. Therefore, it would seem that there is no strong evidence that existing financing profiles are inefficient, and so it would be inappropriate to remove compensation for the risk of error between the allowance and the average efficiently incurred cost of debt.

3.1.3 Summary

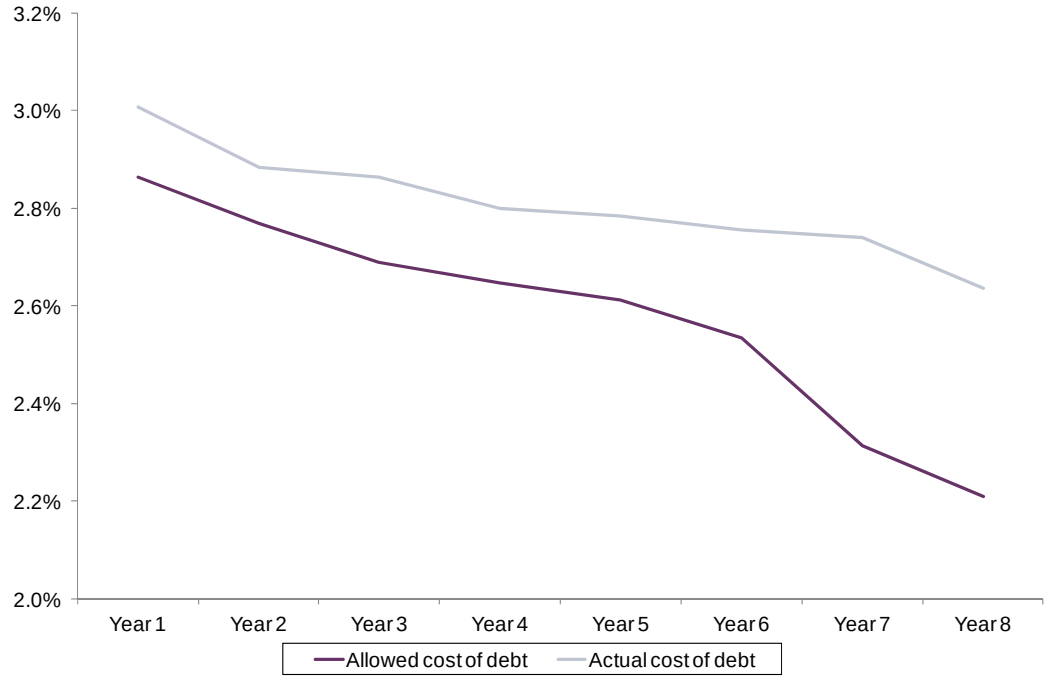
A number of factors suggest that exposure to cost of debt risk will not be zero under indexation. Debt indexation may actually increase the exposure to cost of debt risk compared with a fixed cost of debt allowance. For example, for companies whose debt costs are largely fixed over the price control period, annual updating of the cost of debt allowance will introduce additional uncertainty around the difference between the allowed and the actual cost of debt. It may be necessary to consider mechanisms to modify or supplement the debt index to ensure that companies can finance their functions, with residual uncertainty on the cost of debt being compensated through the allowed return.

3.2 Impact on financeability

Given the recent low levels of yields there is a risk that the ten-year trailing average falls below the efficient cost of debt for a typical network over the RIIO-ED1 period. As part of the RIIO-T1/GD1 reviews, Ofgem's advisers have noted that, with interest rates currently at historically lows, there is a risk that '[d]epending on the future pattern of interest rates, the inclusion of these rates in the index may, therefore, not reflect the efficient costs of debt for a network company over the 2013/21 Price Controls.'[31] Figure 3.1 shows that this risk is just as material in RIIO-ED1 as it is in RIIO-T1/GD1.

[29] Based on data from Dealogic on bonds issued by DNOs on a stand-alone basis.
[30] Ibid.
[31] FTI Consulting (2012), op. cit., para 2.23(4).

Figure 3.1 Expected DNO cost of debt versus the allowance



Note: The allowed cost of debt is estimated assuming that the annual average yield that goes into Ofgem's index remains unchanged from current levels throughout the price control period. The actual cost of debt is based on the assumptions that 24% of existing debt will need refinancing in RIIO-ED1 and that there is real annual RAV growth of 3.1%. The modelling framework is identical to that described in Oxera (2012), 'Determining efficient financing costs for RIIO-ED1', prepared for the Energy Networks Association, September 3rd, Appendix A1.
Source: Dealogic, Oxera.

As noted by Ofgem,[32] it is the case that the potential for divergence between existing and new debt costs exists in all price controls. However, in previous price controls, companies were compensated for the risk of divergence through a margin in the allowed cost of debt; and, in the current environment, there is a large probability that the allowed cost of debt will trend downwards for most of the eight-year price control period, increasing the risk of under-recovery.

It should also be noted that Figure 3.1 takes into account the typical refinancing profile of a DNO's existing debt only, and not any other company specific factors. For example, if companies have raised debt in the past at rates higher than the annual average of historical yields that goes into Ofgem's calculation, the potential gap between the actual and the allowed costs of debt could be even wider.

Given the current interest rate environment, it could be suggested that an appropriate financing strategy could be to refinance existing more expensive debt at lower rates. However, such refinancing would come at a cost as it would require existing bonds to be bought back at values above the par value of the bond.[33]

To reduce risk and mitigate the negative impact on financeability, it is recommended that the suitability of the proposed index is reviewed by analysing DNO-specific debt profiles under a range of scenarios. If there is a risk of under-recovery of efficiently incurred debt costs, options to modify or supplement the debt index could be considered.

[32] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.20.
[33] Bonds with higher coupons than the market yields trade at a premium to the par value.

3.3 Debt issuance costs

The proposed allowance for the cost of debt does not explicitly include an allowance for debt issuance costs, on the premise that 'the level of outperformance relative to the index is sufficient to cover any auxiliary costs the DNOs might incur when issuing new debt'.[34] However, Ofgem also notes that recent bond issuances point to a narrowing of the gap between the index and energy network bond issuance yields.[35]

Previous analysis by Oxera has demonstrated that, on average, the DNOs have issued bonds at rates that were closer to the index than other energy networks, and that the gap has indeed narrowed recently.[36]

Regulatory change, such as Solvency II, is one factor that could contribute to the erosion of the gap going forward. As noted by Ofgem's advisers, there is a risk that there might be reduced demand for longer-dated utilities bonds as a result of Solvency II.[37] One potential impact of reduced demand is that it could it make difficult to issue debt below the index.

In addition, as shown in Oxera's September report, changes in the composition of the iBoxx index over time could affect the ability of the energy networks to issue debt below the index.[38] An increase in the weight of utilities in the index over time could mean that issuing bonds at yields below the index would be more difficult going forward.

It would therefore seem appropriate to take a more explicit approach to ensuring that efficient debt costs, including debt issuance costs, are recoverable regardless of the market conditions. A separate allowance for debt issuance costs would be a suitable means of achieving this.

[34] Ofgem (2012), 'Consultation on strategy for the next electricity distribution price controls—RIIO-ED1—Financial Issues', September 27th, para 2.15.
[35] Ibid., para 2.18.
[36] Oxera (2012), op. cit., pp. 21–2.
[37] FTI Consulting (2012), op. cit., para 9.20.
[38] Oxera (2012), op. cit., pp. 22–3.

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