

Network Rail's Allowed Return

Prepared for ORR

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1. Introduction

This paper is an update on ORR's cost of capital assessment from PR2008. It is intended to inform ORR's thinking as regards the allowed return to factor into the indicative CP5 revenue requirement calculations that ORR will be providing to Ministers in early 2012. The paper is structured into four main parts:

- section 2 looks at the cost of equity for a hypothetical shareholder-owned Network Rail;
- section 3 assesses the cost of unsupported debt;
- section 4 gives an estimate of the weighted average cost of capital; and
- section 5 considers assumptions around index-linked debt, the cost of supported debt, the FIM fee, the risk buffer and financeability.

As may be seen from the above, we assume throughout this paper that ORR's PR2008 financial framework continues unmodified into CP5. This should not be read as saying that there are not grounds for changing elements of this framework, but rather that this is properly the subject for another paper.

2. Cost of Equity

The cost of equity (K_e) is conventionally assessed via CAPM to be the function of the expected return on the market portfolio (R_m), the risk-free rate (R_f), and a firm-specific beta (β), i.e.:

$$K_e = R_f + \beta \cdot (R_m - R_f)$$

The current values of R_m and R_f and a suitable CP5 beta for Network Rail are considered below.

2.1 Generic CAPM inputs

Market return

The value of R_m has been one of the most thoroughly analysed regulatory issues of recent years, thanks mainly to the interventions of the Competition Commission (CC) in their inquiries into price controls for Heathrow/Gatwick, Stansted and Bristol Water. Table 1 picks out the assumptions appearing in recent determinations.

Table 1: Market return (or risk-free rate plus equity-risk premium) assumptions

Regulator, company/sector	Year	%	Year	%
Ofgem, electricity DNOs	2004	7.5	2009	6.7
Ofwat, water and sewerage	2004	7.7	2009	7.4
CC, water and sewerage	-	-	2010	7.0
CAA, NATS	2005	7.3	2010	7.0
Ofgem, transmission	2006	7.0	2012	
Ofgem, gas distribution	2007	7.25	2012	
CAA/CC, airports	2007	6.7	2013	
Ofcom	2009	7.0	2011	6.4

The table shows that with one exception – the PR09 determination by Ofwat, which may legitimately be considered a less important benchmark than the lower assumption made by the CC in Bristol Water’s appeal of Ofwat’s decision – values for R_m have in recent years fallen within a relatively narrow 6.4% to 7.0% range. Importantly, regulators have not been persuaded that the financial crisis of 2008 and subsequent economic recession have in any way affected the return that investors expect on their portfolios. They have instead taken the view that expectations have remained aligned with long-term historical averages, which in effect means that the events of recent years are one-offs with no long-term implications for discount rates.

The 6.4% to 7.0% seems to us to be an obviously sensible range for ORR to be factoring in to its initial PR2013 analysis. Although there are experts that think the range is both too low and too high, these dissenting views have not yet gained acceptance by regulators and ORR would be breaking from a reasonably strong consensus if it departed from this range in its calculations. Accordingly, we suggest that an R_m of between 6.4% and 7.0% is a wholly uncontroversial anchor for the CP5 cost of equity calculation.

Risk-free rate

Arriving at an estimate of R_f presents more of a challenge at the current time given the distortions that the Bank of England’s programme of quantitative easing has introduced to the market for government gilts. Figure 2 below plots the index linked gilt yields over the last ten years for three different maturities of bond.

Figure 2: Index-linked gilt yields (%)



Source: Bank of England.

The task for regulators in recent reviews has been to interpret what the emergence of negative yields on short- to medium-dated gilts and historically low yields on long-dated gilts mean for the expected return on risk-free assets over forthcoming price control periods. Table 3 summarises recent regulatory decisions.

Table 3: Risk-free rate assumptions

Regulator, company/sector	Year	%	Year	%
Ofgem, electricity DNOs	2004	not stated	2009	2.0
Ofwat, water and sewerage	2004	~3.0	2009	2.0
CC, water and sewerage	-	-	2010	2.0
CAA, NATS	2005	2.5	2010	1.75
Ofgem, transmission	2006	not stated	2012	
Ofgem, gas distribution	2007	not stated	2012	
CAA/CC, airports	2007	2.5	2013	
Ofcom	2009	2.0	2011	1.4

The table shows that regulators have during the last three years been aiming up from current market data and using R_f assumptions that imply that gilt yields prior to the onset of the financial crisis give the best indications of the returns that investors will require in future in exchange for holding risk-free assets. This is consistent with the hypothesis that interest rates will rise when the economy starts to grow and the Bank of England ceases its market operations.

Choosing a precise figure for R_f is certainly not easy in current circumstances. However, ORR should note that such difficulties are of very little consequence given the relatively small impact that the value of R_f has on the K_e for a company whose β sits near 1 (see sections 2.2 and 2.3).¹

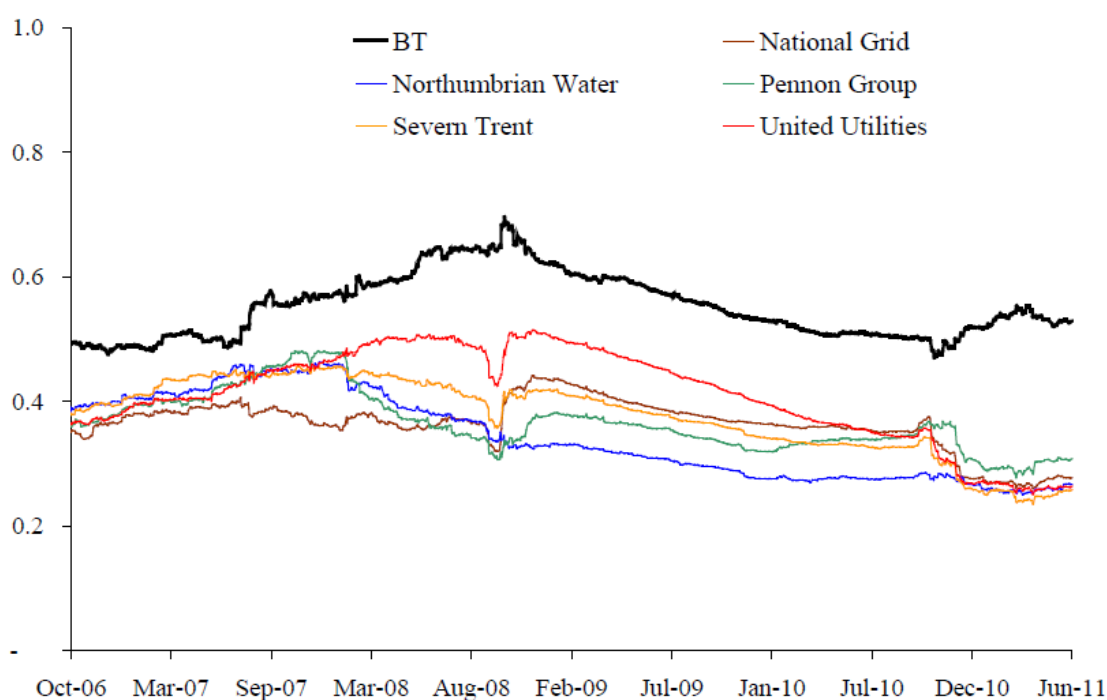
Our advice to ORR would be that there is no reason (yet) to depart from the 2% value used during PR2008.

2.2 Beta

The main area in which there has been a shift in regulatory thinking since PR2008 is in the estimates of regulated companies' betas. This is first and foremost an empirical issue; market data shows that betas of most regulated companies have fallen in the last three years as investors have come to better appreciate the low-risk nature of infrastructure assets. Figure 4 charts the relevant market data.

¹ To see this, substitute $\beta = 1$ in equation 1 and note how the two R_f terms cancel out.

Figure 4: Two-year rolling asset beta estimates



Source: Brattle Group, Estimate of BT's Equity Beta, prepared for Ofcom in July 2011.

The consequent downward movement in regulators' estimates of betas is set out in table 5.

Table 4: Asset beta assumptions

Regulator, company/sector	Year	%	Year	%
Ofgem, electricity DNOs	2004	0.425	2009	0.34
Ofwat, water and sewerage	2004	0.45	2009	0.425
CC, water and sewerage	-	-	2010	0.36
CAA, NATS	2005	0.60	2010	0.60
Ofgem, transmission	2006	0.40	2012	
Ofgem, gas distribution	2007	0.375	2012	
CAA/CC, Heathrow	2007	0.47	2013	
Ofcom, Openreach	2008	0.53	2011	0.48

The relevance of the above figures depends on how risky Network Rail is in comparison to other regulated companies. During PR2008 a report from First Economics found that Network Rail's risk profile looked similar to that of electricity, gas and water networks and that it was reasonable to expect ORR's cost of capital assumptions to be comparable to those made by Ofgem and Ofwat.² It is premature to repeat the analysis that we carried out in its entirety at this early stage of PR2013, but we think we can be reasonably confident, in the absence of major external shocks and/or changes in regulators' risk allocations, that this comparison still broadly holds.

² First Economics (2008), The Riskiness of Network Rail Relative to Other Regulated Industries.

This makes the figures of 0.34 from Ofgem's DPCR5 determination and 0.36 from the CC's Bristol Water inquiry decision the most relevant benchmarks. It would therefore seem sensible for ORR to factor an asset beta of 0.35 into its early PR2013 calculations.

2.3 Overall cost of equity estimate

Using ORR's PR2013 gearing of 62.5%, an R_m of 6.4% to 7.0%, an R_f of 2% and an asset beta of 0.35, the post-tax cost of equity can be calculated to be 6.1% to 6.7%. This compares to the PR2013 cost of equity of approximately 6.75%.

The small reduction in K_e is wholly attributable to a lower beta assumption. If ORR were to accept the above numbers, it would be saying that Network Rail, in common with other infrastructure assets, is likely now to be viewed as a more attractive investment thanks to the jolting effects that the financial crisis and consequent global recession have had on unregulated companies. The company is therefore able to offer a lower prospective return and still be confident of attracting equity capital in to the business.

If equity issuance were a realistic prospect during CP5, such assumptions would need to be subjected to further checks and analysis. But for the purposes of fixing the allowed return for a company limited by guarantee and as part of the giving of only indicative advice to Ministers, the mid-point of this range at 6.4% looks to us to be a reasonable central estimate for ORR to factor into its price control calculations.

3. Cost of Unsupported Debt

With Network Rail continuing to raise all of the debt it requires using the government's FIM, ORR's assumptions about the cost of unsupported debt have to come from benchmarking to the interest payable by corporates with comparable credit quality. The calculation below is in two parts:

- first, we give an estimate of the embedded fixed-rate borrowings that an efficient company might be expected to have following previous debt-raising exercises; and
- second, we provide a forecast of the cost of new debt that is to be raised between now and the end of CP5.

A key input into the discussion that follows is the assumption that we make about the credit rating that rating agencies would give to unsupported debt. We recall that Fitch, Moody's and S&P have offered differing views during previous discussions, partly because they disagree on the strength of the 'halo effect' that Network Rail gains from its closeness to government. To simplify the analysis, we assume that the targeted credit rating would be A3/A- to Baa1/BBB+, the conventional regulatory assumption for network companies. If ORR considers that this understates or overstates the likely credit rating, it may be necessary to adjust the figures that follow up or down.

3.1 Methodology and treatment of embedded debt

The idea that a regulator should allow for the cost of fixed-rate embedded debt is now well-established in economic regulation. The CAA, CC, Ofgem and Ofwat have all made explicit assumptions about embedded debt costs in recent determinations; only Ofcom has ignored such considerations, and its decision to do so is currently the subject of an appeal to the CAT/CC.

The CC's preference – as seen in its airport and Bristol Water inquiries – has been to measure company-specific embedded debt costs by reference to a company's actual borrowings. This

approach is obviously of no use to ORR with its focus on a hypothetical Network Rail. Instead, the two most obvious points of reference for ORR come from Ofwat's PR09 determinations and Ofgem's emerging thinking in the ongoing transmission and gas distribution price control reviews.

Ofwat's uniform PR09 assumption for all companies it regulates was that the debt on starting balance sheets for the 2010-15 was locked in at an interest rate of 3.4% real. The computations that sit behind this figure were not disclosed, although Ofwat indicated that its assumptions were consistent with the average embedded debt costs across the industry at the time (i.e. November 2009).

Ofgem's consultations earlier this year give a more up-to-date benchmark for ORR to consider. As part of its new RIIO model, Ofgem is proposing to calculate the cost of debt mechanistically as the ten-year trailing average of two iBoxx indices measuring the yield on non-financial corporate 10-plus-year maturity A and BBB rated bonds. It is effectively saying that this calculation reveals the efficient interest costs for a regulated network company at any given point in time. Taking the value of the index at 31 March 2011 and converting the nominal yield to a real cost of debt using measures of inflation extracted from the gilt market, Ofgem reported earlier this year that most recent data point for the 'allowed' cost of debt is 3.2%.

Ofgem's computation can be criticised on a number of grounds – most notably the arbitrariness of the ten-year average, the choice of iBoxx indices and the margin of error around the adjustment for inflation. However, for ORR's purposes, as an early sighter pending more detailed work later on in PR2013, the methodology seems robust enough for ORR to be able to refer to the index and its 31 March 2011 value in compiling its advice to Ministers. (The alternative of ORR constructing its own hypothetical embedded debt portfolio is unattractive given the effort required and the judgment that ORR will be required to exercise.) Accordingly, we think it is reasonable for ORR to assume that the cost of Network Rail issued unsupported debt at the end of the last financial year would have been 3.2%.

3.2 Forward-looking cost of debt

A more up-to-date picture of the cost of debt can be obtained by looking at issuance during 2011/12. Table 6 lists relevant utility-sector benchmarks.

Table 6: Recent bond market issuance from UK regulated utilities

Date of issue	Issuer	Amount	Maturity	Coupon	Rating
17/05/11	WPD (West Midlands)	£800m	2032	5.75%	Baa1/BBB
27/05/11	NIE	£400m	2026	6.375%	A-/BBB+
10/06/11	London Power Networks	£250m	2023	5.125%	Baa1/BBB+
10/06/11	Southern Power Networks	£200m	2030	5.625%	Baa1/BBB+
08/07/11	SP Distribution	£350m	2026	5.875%	A3/A-
07/09/11	Scottish & Southern	£100m	2021	4.25%	A3/A-
27/09/11	Eastern Power Networks	£250m	2021	4.75%	Baa1/BBB+
28/09/11	Southern Gas Networks	£300m	2023	4.875%	Baa1/BBB
30/09/11	National Grid	£260m	2021	1.25% (IL)	Baa1/BBB+

Source: FT.com

The interest rates towards the end of table 6 are historical lows for the corporate sector. The 1.25% National Grid issue is especially eye-catching, although the three preceding entries in the table are arguably as remarkable when set against elevated expectations of RPI-measured inflation (of which more below).

A regulator would normally take recent data of this type to be the most reliable predictor of future interest rates. However, in current market conditions, with the Bank of England actively intervening to keep borrowing costs down across the economy, it must be prudent for ORR to allow for some bounceback in interest rates as the UK economy continues its recovery from recession and growth reverts back to trend.

Exactly how much headroom to allow is a matter of judgment. We would suggest that one reasonable central estimate of unsupported borrowing costs in CP5 would be the 3.2% figure identified as the ten-year average in the preceding section, although we would accept that others may legitimately see interest rates settling higher or lower than this. ORR might therefore allow in its early projections for a gradual increase in the real cost of unsupported debt from around 1.5% currently to 3.2% by the end of CP4.

Whatever the precise figures ORR ultimately chooses, it should be aware of a shift up in long-term forecast RPI-measured inflation. The Office of Budgetary Responsibility (OBR) reported in November that changes in inflation measurement mean that a CPI inflation target of 2% is now best thought of as converting into RPI-measured inflation of 3.4%. If ORR uses the OBR's forecasts in its financial modeling, a 3.2% real cost of debt would be equivalent to a 6.7% nominal interest rate.³

4. Weighted Average Cost of Capital

Table 7 combines the analysis of the cost of equity and the cost of debt into an overall estimate of the cost of capital for a hypothetical shareholder-owned Network Rail.

Table 7: The weighted average cost of capital

	Current estimate
Gearing	0.625
Cost of equity	6.1% to 6.7%
Cost of debt	3.2%
Vanilla WACC	4.3% to 4.5%

The table deliberately focuses on Network Rail's current weighted average cost of capital. Consistent with the position set out in section 3.2, we note that the range may be expected to fall in the short term as Network Rail takes on more cheap debt during the remainder of CP4 and into CP5. Because we don't have access to information on Network Rail's borrowing requirements (because this depends on the assessment that ORR is making of future renewals and enhancement spend), we can't quantify the size of this reduction at this time.

5. Other Issues

In addition to the cost of capital inputs detailed in sections 2 and 3, ORR has asked for our views on a number of related issues as set out below.

³ The conversion formula is $(1 + \text{real cost of debt}) = (1 + \text{nominal cost of debt}) / (1 + \text{forecast inflation})$

5.1 Index-linked debt percentage

Approximately one half of Network Rail's debt is index-linked. This is a higher percentage than most other network companies; our understanding is that United Utilities has been the next most enthusiastic company about index-linked debt and has arranged approximately 40% of its borrowings on this basis (although other companies have created an even greater link to RPI through swaps).

The only regulator to have made an explicit assumption during a periodic review about the mix of debt on companies' balance sheets is Ofwat. Its PR09 determination assumed that 30% of each company's debt at 1 April 2010 was index-linked; the remaining 70% was assumed to be conventional nominal issuance. These proportions were set to be in line with industry averages at the time of Ofwat's decision. Ofwat further assumed that it would not be possible for companies to raise new index-linked debt following changes in market appetite during the financial crisis.⁴

This latter assumption looked broadly justified until a few months ago. However, as reported in section 3, National Grid was able in September to issue £260m of new index-linked debt in an unprecedented offer to retail investors. The success of this initiative is seen by commentators as opening the door for other new issues in the coming months.

It is not obvious to us why ORR would want to assume a hypothetical mix of FIM-supported debt in its periodic review work. Although index-linked debt has proved expensive in recent months, the enduring RPI link in ORR's regulatory framework, the boost to future interest cover ratios that index-linked debt gives and the gap between the figures in table 10 below all make it difficult to argue that it was imprudent for Network Rail to aim for a 50:50 mix. Going forward, ORR might wish to assume that Network Rail will continue to maintain a 50:50 ratio and would seek to raise some unsupported index-linked debt if it is agreed that it should give up the protections of the FIM.

5.2 Cost of supported debt

Network Rail's actual borrowing costs, absent any moves to cap the FIM, are closely linked to gilt rates. Table 8 shows the OBR forecasts for nominal market rates through to 2016/17.

Table 8: OBR nominal gilt rate forecasts

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Weighted average	2.3%	2.6%	2.9%	3.2%	3.4%	3.6%

The above rates are remarkable because they sit below the OBR's forecast for RPI-measured inflation in the relevant years. It is also only in 2016/17 that gilt rates are seen moving above the long-term equilibrium rate of inflation of 3.4%.

These things mean that Network Rail will face a very low real cost of debt during the remainder of CP4 and into CP5. A simple assumption, for the purposes of giving advice to Ministers only, might be that Network Rail can continue to borrow at about 30 basis points above gilts. The nominal and real cost of supported debt is as set out in table 9 below.

⁴ The logic, as we understand it, is that most index-linked issuance had historically been dependent on credit wrapping by the monoline insurers. When the insurers effectively went out of business in 2008/09, utilities found that they could not sell index-linked debt with A or BBB category credit quality.

Table 9: Estimates of the cost of supported debt

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Nominal	2.6%	2.9%	3.2%	3.5%	3.7%	3.9%
Real	-0.8%	-0.5%	-0.2%	0.1%	0.3%	0.5%

Note: the nominal figures have been converted to real using the OBR's 3.4% long-term RPI inflation assumption.

5.3 FIM fee

The FIM fee is designed to capture for the DfT the benefit that Network Rail obtains from being able to raise debt with the backing of a government guarantee. The value of the fee during CP4 is 80 basis points.

This looks to us currently to understate considerably the savings in interest that Network Rail enjoys. Table 10 shows the company's effective interest rates during 2010/11. The figures can be compared to ORR's allowed CP4 cost of debt of approximately 3.4% real.

Table 10: Average interest rate paid by Network Rail by debt type, 2010/11

	%
Nominal	5.3
Index-linked	1.4

Source: ORR (2011) Annual Efficiency and Finance Assessment of Network Rail 2010-11.

If one converts the 5.3% nominal figure to its real equivalent using break-even RPI-measured inflation of 3.4%, Network Rail's effective real cost of debt across all borrowings in 2010/11 was approximately 1.6%.⁵ This means that a FIM fee of 180 basis points in 2010/11 would have been needed to leave Network Rail in a position where it neither made money nor lost money in 2010/11 as a result of the FIM.

Going forward, the appropriate value of the FIM fee looks to differ according to whether one looks at embedded debt or future debt.

The difference between the effective interest rate on existing debt (1.6%) and our proposed cost of unsupported embedded debt (3.2%) is 160 basis points. By contrast, the difference between our forward-looking estimates of the cost of unsupported debt (1.5% currently rising to 3.2% by the end of CP5) and the estimates of supported debt that we made in section 5.2 is in excess of 200 basis points.

It may therefore be worth ORR considering a split FIM fee as part of PR2013.

5.4 Risk buffer

The remainder of Network Rail's allowed return after the payment of interest costs and the FIM fee is apportioned between a risk buffer and the ring-fenced investment fund. In PR2008 the risk buffer was sized to be an average £208m per annum.

This amount was based on analysis by Oxera which considered what the buffer should be based on four different methodological approaches. It is almost certainly premature for ORR to repeat

⁵ The equivalent real cost of Network Rail's nominal debt is calculated as $1.053/1.034 - 1 = 1.8\%$. The effective real cost of debt across all borrowings is calculated as $0.47 \times 1.8\% + 0.53 \times 1.4\% = 1.6\%$, where 0.47 and 0.53 are the proportions of nominal and index-linked debt respectively.

these analyses prior to giving advice to Ministers; instead ORR might consider simply scaling up or scaling down the buffer in proportion to its early assessment of the necessary period-on-period reduction or increase in Network Rail's efficient expenditure.

The CP4 risk buffer is equivalent to 3.6% of Network Rail's average annual expenditure over the five-year period. This would therefore be a relevant multiplier to apply going forward.

5.5 Financeability and financial indicators

If ORR wishes to perform a check on financeability prior to finalising the parameters listed in this paper, it can draw on the guidance that the rating agencies have given in their previous discussions with ORR, DfT and Network Rail regarding the ratios that Network Rail would need to achieve in order to obtain a solid investment-grade credit rating on unsupported debt. We understand that ORR has historically interpreted this guidance to mean that Network Rail should exhibit the same financial strength as a water and sewerage company seeking a solid investment-grade rating. (This is consistent with the view that Network Rail is as risky as conventional network utilities.)

In the absence of any more direct insights from the rating agencies, ORR might use the thresholds identified by Ofwat in PR09 to guide its early financeability testing. These are set out in table 11.

Table 11: Ofwat's key financial indicators for water and sewerage companies

Indicator	Threshold
FFO to interest	above 3 times
Adjusted interest cover	above 1.6 times
FFO to debt	above 13%
Retained cash flow to debt	above 8%
Gearing	below 65%