

## Appendix A

First Economics methodology for the estimate of Network Rail's CP4 corporation tax allowance.

**The CP3 Tax Carryover: An Indicative Calculation**  
**Prepared for ORR**

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**1. Introduction**

ORR is currently minded to calculate Network Rail's CP4 revenue requirement using a post-tax rate of return and a separate allowance for forecast CP4 tax payments. In switching away from the pre-tax rate of return used in the calculation of CP3 revenues, ORR will say that it must recognise that the company has already been funded for some of the tax payments that it will make in the future. The purpose of this note is to provide a provisional calculation of the amount of this pre-payment.

The note is structured into three main parts:

- section 2 sets out a methodology for the calculation;
- section 3 puts forward a 'best estimate' for the figure in question;
- section 4 positions this point estimate within a wider confidence interval; and
- section 5 concludes.

**2. Methodology**

The main difficulty that ORR faces in making an adjustment for tax allowances in CP3 is the absence of any explicit tax calculation in the ACR2003 final conclusions. Rather than identify tax as a separate line item, the Rail Regulator chose to set a pre-tax rate of return which was broadly in line with the headline rates of return that had been allowed by regulators in periodic reviews of other infrastructure businesses. The key paragraphs from the ACR2003 final conclusions document are as set out below:

The Regulator explained in his third consultation document that he considers that it is appropriate [when setting the allowed rate of return] to place significant emphasis, at least in the first instance, on comparisons with other regulated network businesses and on assessing how much risk investors in Network Rail bear compared with investors in these other companies. If it appears that Network Rail's investors bear similar levels of risk to investors in similar businesses, the Regulator considers that this provides a strong basis for setting a similar overall return. Equally, if it can be shown that investors in Network Rail bear higher (or lower) risk, this provides a strong argument for allowing a relatively higher (or lower) return than that earned by other regulated businesses.

His final conclusion is that he should allow Network Rail to earn a return within the range of 6.5% to 7.0% per annum. This figure is lower than the return that he allowed Railtrack because Network Rail's lenders will bear lower risk than investors in Railtrack. Instead, the allowed return is now much more in line with the allowances made previously by Ofwat and Ofgem. Whilst the Regulator considers that Network Rail remains more likely than other monopoly network businesses to experience variations in profitability (because of its relatively high operational gearing), his view is that Network Rail benefits from significant protections which transfer risk away from lenders.

The range of 6.5% to 7.0% set out above is a pre-tax rate of return. Network Rail will therefore need to cover any tax payments it is obliged to make from the surpluses that it generates.

The Regulator notes that this position is consistent with the approach adopted by most of the other regulators. In particular, the comparisons set out earlier in this chapter between Network Rail and other regulated utilities focused on the pre-tax returns earned by other, similar businesses. The Regulator has not been provided with any evidence to suggest that the tax shields that are available to Network Rail are any less favourable than those that are available to these other companies – indeed, if anything, Network Rail is likely to make much lower tax payments than other regulated businesses. The Regulator therefore considers that it is appropriate for him to set Network Rail's allowed return in line with the pre-tax returns earned elsewhere.

(paragraphs 13.11, 13.26, 13.29 and 13.30 of the ACR2003 final conclusions document)

The consequences of this approach are two-fold:

- first, it is undeniably the case that a proportion of Network Rail's funding in CP3 was intended to fund the company's future tax payments; however
- second, the amount of this funding cannot be calculated with any real precision. Instead, it has to be estimated on the basis of a retrospective allocation of the overall return to the cost of debt, tax and an operating surplus.

Coming up with an *ex post* rationalisation of the approach that the Regulator adopted over four years ago inevitably introduces a degree of subjectivity to ORR's PR2008 determination. The allocation of the overall return into these three component parts is, however, made somewhat more straightforward by the existence of an established methodology for calculating a pre-tax rate of return. In successive periodic reviews stretching back to the early 1990s, regulators have adopted an approach comprising the following four steps:

- step one: estimate the real cost of debt for the company in question (i.e. the rate of interest payable on debt absent compensation for the effects of inflation);
- step two: estimate the real cost of equity;
- step three: gross up the cost of equity in step two into a pre-tax rate cost of equity (i.e. a rate of return that provides shareholders with the underlying cost of equity once allowance for corporation tax payments has been made); and
- step four: using an estimate of gearing, weight the real cost of debt from step one and the pre-tax cost of equity from step three into an aggregate pre-tax rate of return.

The computation set out above can be written as the following equation:

$$r = g \cdot K_d + (1 - g) \cdot [K_e \cdot (1 + \text{tax gross up})]$$

where  $r$  is the pre-tax rate of return,  $g$  is gearing,  $K_d$  is the cost of debt and  $K_e$  is the cost of equity. Rearranging gives:

$$r = g \cdot K_d + (1 - g) \cdot K_e + \text{compensation for tax} \quad \text{or}$$

$$\text{compensation for tax} = r - g \cdot K_d - (1 - g) \cdot K_e$$

It follows from the above formula that the amount of funding for future tax payments in the ACR2003 settlement depends on the values that one attributes to the cost of debt, cost of equity and gearing.

### 3. Central Estimate

The ACR2003 final conclusions document specifies values for two of the parameters in the equation:

- an estimate of the real cost of debt of 3.25% per annum; and
- a forecast that gearing would decline from a peak of 0.8 at the start of CP3 to lower levels thereafter.

In addition, annual estimates of gearing were contained in the joint financial model which was shared between the parties during the Regulator's review.

These figures cannot by themselves be used to reveal the allowance for taxation; in order to solve the equation it is necessary to obtain a value for the cost of equity. Unfortunately, the ACR2003 documents at no point make explicit reference to such a concept, let alone discuss what value it might take. However, paragraph 13.30 of the ACR2003 final conclusions document does provide information which helps to make the equation solvable.

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The text implies that the Regulator saw his headline rate of return as compensating Network Rail for tax in a comparable manner to the other regulatory determinations which were used to help fix the CP3 allowed return. Having referenced Ofgem and Ofwat specifically in paragraph 13.26, it is reasonable to assume that he was thinking specifically of the energy sector – this is because Ofwat uses a post-tax rate of return when setting price limits, making any comparison of pre-tax rates of return dependent upon on ORR's own conversion from post-tax to pre-tax.

The Ofgem methodology at the time involved a relatively simple gross up which assumed that equity returns were taxed at the statutory rate of corporation tax of 30%, i.e.:

$$r = g \cdot K_d + (1 - g) \cdot [K_e / (1 - t_c)]$$

This convention provides sufficient information to solve the equation in section 2. Rearranging the above formula and substituting the resulting value for  $K_e$  gives:

$$\begin{aligned} \text{compensation for tax} &= r - g \cdot K_d - (1 - g) \cdot [(1 - t_c) \cdot (r - g \cdot K_d) / (1 - g)] \\ &= r - g \cdot K_d - (1 - t_c) \cdot (r - g \cdot K_d) \\ &= t_c \cdot (r - g \cdot K_d) \\ &= 0.3 \cdot (r - g \cdot K_d) \end{aligned}$$

Table 1 uses this calculation, together with the above-mentioned 3.25% cost of debt and the gearing levels in the joint financial model, to show how much of the CP3 allowed return can be attributed to funding for tax payments.

**Table 1**

	Tax-related component of the pre-tax rate of return (%)	Tax-related component of the allowed return (£m, 2006/07 prices)
Year 1	1.29%	277
Year 2	1.31%	311
Year 3	1.19%	301
Year 4	1.22%	322
Year 5	1.25%	342
	Total	1,553

*Note:* the detailed workings underpinning this calculation are provided in an accompanying spreadsheet.

#### 4. Low and High Scenarios

The calculation in section 3 is anchored to figures that appear in the ACR2003 final conclusions document. The one criticism that could be directed at this approach is that the figures in question were not originally part of an explicit WACC calculation. It may be argued that inputting them to the above equation stretches their use beyond that which was intended and is inappropriate.

As an alternative to the central estimate identified above, ORR might consider the allowance for taxation that comes from taking values for the cost of debt, cost of equity and/or tax gross up that appear in other regulatory determinations from around the same time. The logic for doing this lies in the rationale that the Regulator originally put forward for allowing an aggregate pre-tax rate of return of 7.0% and then 6.5% in the ACR2003 final conclusions – i.e. the view that Network Rail was as risky as other regulated companies and that the company's required returns could be taken from a read-across to returns allowed in other periodic reviews. If the headline figure was (explicitly) taken from other determinations, the underlying parameters might also be said to match (implicitly) the values used by other regulators.

When compared to other regulatory determinations made in the period 1999 to 2003 the calculation in section 3 appears, on the one hand, to make use of a lower-than-normal cost of debt and, on the other, a higher-than-normal figure for gearing. A range around the central estimate can therefore be established by substituting more conventional figures for these two parameters in the equation used previously.

A low estimate is produced by using an alternative figure for the cost of debt. There were four determinations in the energy and water sectors between 1999 and 2003 incorporating the following figures:

- Ofgem's 1999 review of the electricity DNOs: 4.30%;
- Ofwat's 1999 water periodic review: 4.35%
- Ofgem's 2000 review of NGC's transmission price control: 4.45%; and
- Ofgem's 2001 review of National Grid Transco: 4.65%.

These determinations do not provide an absolutely precise figure to be input into the tax calculation. Overall, they appear to point towards a value of around 4.5%.

A high estimate may be obtained by replacing the Network Rail specific figures from section 3 with other regulators' notional levels of gearing for a regulated company. The figures are:

- Ofgem's 1999 review of the electricity DNOs: 0.50;
- Ofwat's 1999 water periodic review: 0.50;
- Ofgem's 2000 review of NGC's transmission price control: 0.60; and
- Ofgem's 2001 review of National Grid Transco: 0.625.

Again, this high-level survey does not produce a single point estimate. Generally speaking, they point to a figure of approximately 0.55.

When converted into millions of pounds, the low (i.e. using a 4.5% cost of debt) and high (i.e. assuming gearing of 0.55) estimates of the Rail Regulator's CP3 allowances for tax are as follows.

**Table 2**

	Tax-related component of the pre-tax rate of return	Total tax-related CP3 revenue (£m, 2006/07 prices)
Low	1.01% (year 1), 1.03% (year 2), 0.92% (year 3), 0.96% (year 4), 1.01% (year 5)	1,223
Central	1.29% (year 1), 1.31% (year 2), 1.19% (year 3), 1.22% (year 4), 1.25% (year 5)	1,553
High	1.49% (years 1 and 2), 1.35% (years 3 to 5)	1,744

*Note:* the detailed workings underpinning this calculation are provided in an accompanying spreadsheet.

## 5. Conclusions

The numbers presented in table 2 constitute a fairly symmetrical and relatively narrow range around a central point estimate. In its PR2008 determination ORR will need to identify a single figure and must therefore consider how it should choose between the methodologies set out above.

In the view of the author, the choice should be between the central and the high estimates. The low estimate relies upon a figure for the cost of debt which sits a considerable distance away from the forecast cost of debt that the Rail Regulator identifies in his ACR2003 final conclusions document. It is also a very long way away from the cost of debt that Network Rail was actually able to achieve during CP3. To give Network Rail the benefit of interest tax shields that it has not actually obtained, nor was ever likely to obtain, would lead to a higher revenue requirement at future periodic reviews. Unless ORR has a very good reason to impose this burden on funders, this would not be equitable.

The choice between the central and high estimates then comes down to a choice between using Network Rail's forecast gearing and an 'optimal' or 'notional' level of gearing. ORR is facing exactly this choice in other aspects of its PR2008 analysis, and it may be desirable to exhibit a degree of consistency in approach. However, it also has to be remembered that in this specific part of the determination ORR is first and foremost interpreting how the Rail

Regulator thought and acted in 2003. There are therefore certain dangers in looking back using the principles and approach that ORR has constructed for the current review.

With this in mind, the author's preference would be for ORR to adopt the central estimate in table 2. Although when setting his allowed rate of return the Regulator referred to determinations by Ofgem and Ofwat that are underpinned by the concept of an optimal or notional level of gearing, the idea is not one that is mentioned anywhere in the documents published during ACR2003. The basic philosophy throughout ACR2003 was instead one of applying established regulatory precedent to Network Rail's specific circumstances. As evidence for this, chapter 15 of the final conclusions document makes it absolutely clear that the assessment of financeability looked at Network Rail's actual balance sheet and actual financial ratios – a clear departure from the Ofgem/Ofwat approach.

Using Network Rail's forecast gearing and forecast cost of debt, consistent with the approach set out in section 3 of this note, implies that ORR ought to recognise funding during CP3 for future tax payments of £1,553m in future periodic review determinations. The recommendation of the author is that this figure should be put to other interested parties for further discussion.