

## Methodology information paper 4: Setting a cost of capital

### Introduction

This information paper indicates our proposed approach to setting a cost of capital. It begins by reviewing standard approaches used by regulators, and then comments on the difficulty in applying these approaches. Given these difficulties, we, the Commission, are considering an alternative approach.

### How the cost of capital works in price setting

One of the most important aspects of a price determination is the financing of current and future assets. This depends on the return on the Regulatory Capital Value (RCV) allowed for. The standard regulatory approach in the UK is to estimate a real weighted average cost of capital (WACC). This WACC is multiplied by the RCV in order to determine the allowed for cash return.

The weighted average cost of capital (WACC) is the overall cost of capital for a firm. It takes account of the capital structure of the firm and the estimates of the cost of debt and of equity.

In order to estimate an appropriate WACC a regulator decides an appropriate rate of return for both debt and equity and an appropriate capital structure.

A further complication in the estimate of WACC is that debt and equity are treated differently for tax purposes. Interest charges are an allowable expense for the purpose of corporation tax. The corporation tax advantages of debt are recognised in the post-tax weighted average cost of capital calculation. This is shown in Figure 1.

**Figure 1: Post-tax weighted average cost of capital**

$$\text{WACC} = \frac{[r_D * D * (1-t)]}{D + E} + \frac{[r_E * E]}{D + E}$$

Where:

r	=	return
D	=	debt
E	=	equity
t	=	corporation tax rate

The investor is however concerned with the real rate of return – that is the return after having adjusted for the effect of inflation.

The formula for calculating the real rate of return is shown in Figure 2.

**Figure 2: Formula for calculating the real rate of return**

Real rate of return = nominal rate of return – inflation rate

It is important to differentiate between the real rate of return (the return after inflation) and the nominal rate of return (the return before account is taken of inflation). The RCV is adjusted upwards to take account of inflation. The allowed for cash return is therefore calculated by multiplying the RCV by the allowed for real WACC.

### Setting the WACC for a public corporation

Assessing the WACC for a public corporation is problematic. This is because the regulator cannot easily observe the market cost of the equity or the debt.

Scottish Water does not borrow directly from the capital markets nor does it borrow at commercial rates. Scottish Water does generate surpluses and it therefore has retained earnings, which it can invest to achieve the outputs set by Scottish Ministers. It does not currently pay dividends and therefore all of the surplus generated is reinvested for the benefit of current and future customers. These retained earnings differ from retained earnings in the private sector in that they are not reinvested with the specific goal of generating increased surpluses in the future. There is therefore a question about whether the allowed for cost of capital should be adjusted to take account of the owner's decision to forego dividends but to accept the risks of ownership.

The remaining sections of this information paper consider:

- the appropriate level of gearing (i.e. how much of the RCV should be financed by debt);
- the cost of debt; and
- the cost of equity (that proportion of the RCV not financed by debt).

### Gearing

The decision on an appropriate capital structure has recently become more difficult as the market has revealed itself to be comfortable with highly geared utilities. However, some companies (most notably Yorkshire

Water) have not followed this trend and have maintained a relatively low rate of gearing. It has therefore become more difficult for a regulator to decide on an appropriate level of gearing. A regulator could theoretically set individual allowances for the cost of capital for each company that it regulates. However it is likely that in so doing, the regulator could, in effect, force companies to adopt a particular capital structure.

### **Cost of debt**

The cost of debt is the most straightforward element in assessing an appropriate cost of capital. There is now much greater transparency in the cost of debt for different companies. There is, however, an issue about whether to use the current or long run price of debt.

#### *Current price method*

A cost of debt using current prices can either allow for embedded debt, or allow interim determination type adjustments based on changes in the observed real cost of debt. There would be interim determinations of the cost of debt when there was a significant difference between actual real market rates and the real rate allowed for in the price determination. This has the advantage that the regulator does not have to make an assessment of the nature of the embedded debt (e.g. debt that was incurred as a result of a refinancing and has subsequently become expensive should not attract any additional allowance). It also avoids the potential for over or under resourcing the regulated company that is likely to result from using long run average debt costs. The disadvantage is that customer prices cannot be fixed absolutely for a regulatory control period.

On balance, we consider that the allowance for embedded debt is a more transparent approach, but there needs to be a check on whether debt was incurred prudently and efficiently. We also consider it important to remove any unnecessary uncertainty in the prices that customers will pay.

#### *Long run price method*

The use of long run prices (where the normal real cost of debt for water utilities can be estimated) is problematic. Companies will tend to pay out surplus cash in dividends (during times when the real interest rate is lower than the long run average) and assert that the allowance for the cost of capital is insufficient when the real interest rate is higher than its long run average. In a Scottish context (where dividends are not currently paid), there would be either a lessening of the budget constraints that apply to Scottish Water or a shortfall in the required level of financing.

## Cost of financing the unleveraged portion of the RCV

The RCV must be remunerated at a level that allows the company to access finance and to compensate the owner appropriately for the risks that it is required to manage. In this regard there are no essential differences between various ownership arrangements (although there may be specific differences in the opportunity costs of accessed capital). The cost of financing this unlevered portion of the RCV (equity) is, by some distance, the most problematic element in calculating the weighted average cost of capital. There are three broad approaches:

- the capital asset pricing model (CAPM);
- the dividend growth model (DGM); and
- the use of comparators.

### *Capital asset pricing model*

The capital asset pricing model (CAPM) estimates the return on a particular equity using three variables: the risk-free rate, the market risk premium and the beta of the stock<sup>1</sup>. The market risk premium is the expected return on the market minus the risk-free rate. This cannot be calculated with certainty but can be estimated using historical returns. The beta of a stock measures its volatility relative to the volatility of the market. A stock with a beta of 1 is no more or less volatile than the market, whereas a stock with a beta of 0.5 will be only half as volatile (i.e. it will on the average move 0.5% if the market moves 1%, up or down).

The formula for the CAPM model is shown in Figure 3.

**Figure 3: The capital asset pricing model**

$$r = r_f + \beta(r_m - r_f)$$

Where:

$r$	=	return on the equity of the firm
$r_f$	=	risk-free rate
$\beta$	=	beta
$r_m$	=	return on the market

The CAPM requires the assessment of an equity beta. It may be difficult to determine the beta with confidence and even a small error could be quite material in the allowance for the cost of equity. We propose to consider whether we can pursue this traditional approach.

<sup>1</sup> Information paper 3 explain these terms

*Dividend growth model*

The dividend growth model (DGM) measures the return on a share by forecasting future dividend growth. The model assumes that expectations on future dividends are correctly incorporated into the current share price. The formula for the DGM is shown in figure 4.

**Figure 4: The Dividend Growth Model**

$$r = \frac{\text{DIV}_1}{P_0} + g$$

where:

- r = rate of return
- DIV<sub>1</sub> = projected dividend for next year
- P<sub>0</sub> = current market price
- g = expected rate of growth in dividends

In considering the cost of capital for non regulated businesses, the DGM can be implemented fairly straight-forwardly. The present share price can be observed in the market. Expected dividends and the likely growth rate of dividends have to be estimated based on company guidance or analysts' reports.

The DGM may be difficult to use for a regulated company. A forward looking DGM would be circular (dividends depend on the cost of capital and the cost of capital depends on the potential for dividend growth). Considering the DGM on an historic basis removes this circularity; however, it is likely to be difficult to assess the underlying real growth in dividends over the years since privatisation. This is because the capital structure of the industry has changed significantly. There is also a likelihood that the industry cost of capital has changed significantly during this period.

*Comparator method*

A third approach is to use comparators to estimate an appropriate WACC. The regulator could use analysis of market transactions (both proposed and realised) to gather evidence of the market's view of the cost of capital. Alternatively the regulator could use information from related or similar industries to make an estimate of the cost of capital. The use of comparators relies on the quality and detail of the information. At the current time we consider that this is most likely to be useful as a check rather than as a primary method of calculating the cost of equity.

## Implications for our approach

In recent price reviews, it has become increasingly common for regulators to adjust materially the results of the building blocks approach<sup>2</sup> to price setting, to ensure that the regulated company can meet the financial ratios that are demanded by the market. However, if the regulator has to adjust prices to comply with externally determined financial ratios, this would imply that the building blocks approach to setting prices has suggested price caps that are inconsistent with the market's view of the financeability of the water industry. This could reflect a difference in view on the current cost of capital (the CAPM calculates an average cost) or in the allowance for depreciation. Perhaps such differences are to be expected given the difficulty of assessing the cost of capital.

## A potential alternative approach

We are considering an alternative approach. We would recognise that the credit rating agencies contribute substantially to the market's view on the appropriate cost of capital – particularly when companies require continuing access to the debt markets for substantial sums.

We could potentially set prices that allow compliance with a suite of financial ratios, and allow for an appropriate cost of capital consistent with these ratios (plus the costs of any appropriate embedded debt allowance).

We would expect the requirements of such an approach to include the following:

- an assessment of an appropriate cost of debt;
- an assessment by a credit rating agency of appropriate financial ratios for Scottish Water's circumstances;
- financial scenario and risk modelling to assess levels of revenue that are consistent with broadly meeting these ratios during the regulatory period and into the medium term;
- smoothing of these revenue levels, consistent with avoiding volatility in prices;
- deriving the percent rate of return on the unleveraged portion of the RCV that would generate sufficient cash such that the targeted financial ratios could be met.

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<sup>2</sup> 'Building blocks approach' – this is explained in Information Paper 2

This approach has the disadvantage that it is novel and untested. However, it may be more transparent, and, if properly explained, is likely to be less contentious than the normal estimates of the WACC. We will ask leading experts in the field for their views before deciding how to set the cost of capital. Their advice will be published.

#### **Related documents**

‘The Strategic Review of Charges 2006-10: The draft determination’, Volumes 3 and 5, Water Industry Commissioner for Scotland, June 2005.

‘The Strategic Review of Charges 2006-10: The final determination’, Water Industry Commission for Scotland, November 2005.