



Financing Networks: A discussion paper

February 2006

Contents

| | Page No. |
|--|-----------------|
| Foreword | 4 |
| Section 1 Introduction | 8 |
| Section 2 The impact of gearing on management incentives and the ability of management to deliver investment | 11 |
| Section 2a Background | 11 |
| Section 2b Impact of high gearing on management incentives and the ability to deliver efficient investment | 12 |
| Section 2c Risks and consequences for regulated businesses of disruption to debt markets | 16 |
| Section 3 Gearing and the regulatory framework | 19 |
| Section 3a Financial ring fencing | 20 |
| Section 3b Gearing and its impact on regulators' discretion at price control reviews | 22 |
| Section 3c Special Administration | 24 |
| Section 4 Recent changes to the approach to setting price controls | 29 |
| Section 5 The suggestions made by Helm and Mayer | 32 |
| Section 6 Setting price controls and issues of financeability | 39 |
| Section 7 Options for dealing with issues of financeability | 47 |
| Section 7a Market mechanisms | 48 |
| Section 7b Options requiring regulators to modify their approach to setting price controls | 56 |
| Section 8 Issues for discussion | 66 |
| Annex A The constraints created by financial ratios | 68 |

List of figures and tables

| | | Page no. |
|----------|---|-----------------|
| Figure 1 | Real return vs nominal interest and dividends – company in “steady state” | 41 |
| Figure 2 | Real return vs nominal interest and dividends – including capital programme | 43 |
| Figure 3 | Revenues with 40 years asset lives | 63 |
| Table A | Financial projections and ratios for a company in "steady state" | 42 |
| Table B | Financial projections and ratios for a company that undertakes a significant programme of asset improvement – the "Base Case" | 44 |
| Table C | Financial projections and ratios for the "Base Case" assuming a proportion of index-linked debt | 48 |
| Table D | Financial projections and ratios for the "Base Case" assuming a £60m equity injection in year 2 | 51 |
| Table E | Financial projections and ratios for the "Base Case" assuming dividend constrained for the required equity formation | 54 |
| Table F | Financial projections and ratios for the "Base Case" with revenue uplift | 59 |
| Table G | Financial projections and ratios for the "Base Case" with accelerated depreciation | 61 |

Foreword

Introduction

In approaching this paper Ofwat and Ofgem asked Keith Palmer to review the paper and provide observations from a market practitioner's perspective. In addition Keith has produced the following foreword setting out his perspective on this report. Keith is the founder and Chairman of Cambridge Economic Policy Associates. He has 30 years experience advising the public and private sectors on economic and financial issues across a variety of sectors and industries; including strategic corporate advice and debt and equity raising and advising on the price regulation of network industries. Keith has worked for over 20 years in senior positions at Rothschild & Sons Ltd, the UK investment bank, where he is currently non-executive Vice Chairman.

Foreword

In the years preceding the 2004 Ofwat price control review, commentators had expressed concerns about the adoption by a number of regulated water companies of highly geared capital structures. This trend culminated in the creation of Glas Cymru, a company with no share capital, in 2001. The concerns expressed at the time were that regulators would be less able to act to protect consumers if highly geared companies were to become subject to financial distress. As a consequence, risk might be transferred from shareholders and lenders to consumers. Ofwat sought to make it clear that it would not allow this to happen. Nevertheless a number of commentators made proposals for revisions to the regulatory approach designed to address those concerns.

In the period preceding the 2004 price control reviews both Ofwat and Ofgem were well aware of the large external financing requirements of the water and energy network businesses over the 2005-2010 period and beyond. The price control reviews had to take account of this large financing requirement and of the concerns noted above, while ensuring price limits delivered the best value for consumers.

The 2004 Ofgem and Ofwat price control reviews can be regarded as successful for three reasons. First, because regulatory risk has diminished. The adoption of more transparent regulatory processes, effective communication with the financial markets through City briefings and extensive consultations during which regulators were seen to be listening as well as speaking all contributed to ensuring there were no 'regulatory shocks' when the determinations were announced. The regulators showed in their actions that they were well informed about the issues of greatest concern to consumers and to the providers of finance. The regulatory risk premium in the cost of capital should go down as a result.

Second, we can now be reasonably confident that the very considerable external financing requirements of the water and energy network businesses over the next five years will be provided by the debt and equity markets. The positive response of the equity market to the 2004 review determinations and the continuing strong appetite of

the debt markets for exposure to the regulated industries bode well for the ability to raise the considerable sums required.

Third, price increases for consumers have been contained, in my view, within tolerable limits despite the huge increases in capital spending required to ensure, inter alia, that continuous improvements in environmental quality and security of supply are sustained. This has been possible only because the regulators have made demanding assumptions in price limits about the scope for future operating and capital efficiency.

Many of the concerns raised in the years preceding the 2004 reviews have now been addressed. Indeed very substantial amounts of long-term debt have been raised without any regulated business losing its investment grade credit rating. However some concerns remain. Two of the more important outstanding issues are the 'financeability' issue and the 'regulatory commitment' issue.

The financeability issue refers to the practice of increasing allowed revenues to maintain investment grade financial ratios. Certain regulated water companies were allowed revenue uplifts in the 2004 review over and above that required to earn the allowed cost of capital. The revenue uplifts were justified on the grounds that without the uplifts these companies might have breached financial ratios important to the ratings agencies - even if they had adopted the notional capital structure assumed by the regulators when determining the weighted average cost of capital. Ofgem had dealt with this issue by profiling the capital depreciation allowance built into allowed revenue.

There are three key questions to be answered about financeability. First, is it reasonable for regulators at future reviews to expect regulated companies to manage their finances so as to avoid the financeability 'problem' in future? Companies might do this by issuing a higher proportion of index-linked debt (an attractive proposition in current debt market conditions) and/or by increasing the share of equity in the capital structure. If it is reasonable to expect companies to manage the problem away then regulators would be justified in indicating that financeability uplifts will not normally be countenanced at future reviews. Second, if regulators decide they must retain the option to advance allowed revenues to deal with a financeability problem in exceptional circumstances, what are those circumstances and how will the problem be dealt with? In particular will any advancement of revenues be recovered at a later date and will the mechanism be present value neutral over time? The way that the financeability issue was dealt with in 2004 by Ofgem was different from the way it was dealt with by Ofwat. In future will there be a common approach? Third, how will Ofwat deal with the revenue uplifts granted at the 2004 review in 2009? Does it intend to adjust future allowed revenues or regulatory asset values to take account of them and if so how? Ofwat has previously indicated that it has no such intention but absolute clarity about the point is also important.

This paper discusses the financeability issue in some detail. It invites responses to specific questions about financeability. It is important that following this discussion paper - and well before the next water and electricity distribution reviews in 2009 - that the regulators' answers to these questions are given. Regulated companies not only need clarity about the regulators' approaches to these questions in future but also sufficient time before the next review to deal with any emerging financeability problems. Where such advance notice cannot be given (e.g. for the current transmission review), it will be important that Ofgem consider whether the benefits of consistency and predictability outweigh the gains of any change in approach.

The issue of regulatory commitment arises because there is an inherent timing mismatch between the five yearly price setting cycle and the much longer tenor of financing of infrastructure businesses. Uncertainty in the financial markets about the allowed cost of capital at future reviews tends to increase the regulatory risk premium in the cost of capital. Some commentators regarded the regulatory commitment issue as a serious constraint on financing of regulated businesses prior to the 2004 reviews. The improved regulatory processes and transparency referred to above as well as the particularly favourable current debt market conditions have, for the time being, ameliorated those concerns. However complacency would be a mistake – in the run-up to the 2009 reviews these concerns may well resurface.

There are a number of possible ways of dealing with the regulatory commitment issue. First, the period between reviews could be lengthened from 5 years to, say, 10 years. Ofwat has recently issued a consultation document addressing this question. Lengthening the price control period is unlikely to materially reduce regulatory uncertainty unless it was combined with enhanced intra-period flexibility mechanisms. Regulators have already adopted some flexibility mechanisms to address unanticipated changes in certain costs eg logging up/down, interim determinations etc. If the review period were to be lengthened materially an important question is whether the allowed cost of capital would need to be indexed to adjust for intra-period changes in financial market conditions.

An alternative (or possibly supplementary) approach would be to set allowed revenues in respect of depreciation and the cost of capital - for sunk capital and capital expected to be incurred over the forthcoming review period - for the full life of those assets (or at least for a considerably longer period than 5 years). This approach would reduce regulatory uncertainty and should therefore lower the cost of capital and strengthen companies' credit quality as assessed by ratings agencies. A downside is that it would lock-in the allowed cost of capital and preclude consumers from benefiting in the event that companies refinance their debt at a lower cost in the future.

Other approaches to dealing with the 'regulatory commitment' issue are considered in this discussion paper.

It is clearly important that further development of regulatory practice occurs only after widespread discussion and consultation with all interested parties. That is why the joint regulators are issuing this discussion document. The questions asked in the document are important. I very much hope that interested parties will avail themselves of this opportunity to give their answers to those questions.

Keith Palmer
February 2006

Section 1: Introduction

1. HMT and DTI (2004)¹ have expressed some concern about the increasing proportion of debt finance (or gearing) that is being used by regulated businesses. They suggested that Ofgem, working with Ofwat and other regulators, should lead a project looking at new ideas for encouraging equity to remain in the energy and water sectors in particular the Dieter Helm and Colin Mayer proposals around a split cost of capital. In addition they suggested that Ofwat should chair a group to consider how regulators might develop indicators of financeability, as a long-term complement to those of credit rating agencies.
2. After further discussion it was agreed that the two regulators should approach these two work streams as a single project and that this would also be an opportunity to consider a wider set of issues around companies access to finance and the approaches to setting price controls. The focus of this report is the water and energy sectors. However, the Office of Rail Regulation, the Civil Aviation Authority (Economic Regulation Group) and the Office of the PPP Arbiter have also shown an interest in this paper and the analysis and discussion questions will have relevance to these and possibly other regulators.

Objectives of the report

3. Since this work was suggested there have been a number of important regulatory and market developments. The conclusion of the price reviews at the end of 2004 for the water and the electricity distribution companies has been important in clarifying the incentives for debt and equity finance. For example, market evidence (see Section 4) now points to equity investors being more comfortable with the regulatory framework and that they appear adequately compensated for the risks associated with investing in regulated businesses. Taking into account developments since 2004, the objectives of the paper are to:
 - discuss the impact of higher levels of gearing and the extent that the regulatory framework is able to protect the interests of consumers from any adverse consequences of higher gearing;
 - describe the incentives for debt and equity investment provided by the new price controls and consider whether there are further refinements to regulatory approaches that should be developed in the future; and
 - discuss and ask questions about other financial issues (linked to the gearing issue raised in the HMT/DTI report), in particular the approaches that regulators have adopted to the financeability of regulated businesses.

¹ "The Drivers And Public Policy Consequences Of Increased Gearing: A Report By The Department Of Trade And Industry And HM Treasury, DTI, October 2004".

4. The paper does not seek to create uncertainty by re-opening existing price controls or trying to reduce each company's discretion to manage its capital structure. This paper is not a 'policy consultation paper' in the sense it will lead to firm conclusions on the way forward. Instead the questions it raises are intended to stimulate debate on a number of important financial issues facing regulated businesses. Any changes to any future approach to setting price controls would only be made following further careful consultation by individual regulators with companies and other stakeholders. These consultations would be informed by the responses to this paper.
5. This paper highlights key issues for discussion. Where we are describing or commenting on already well established regulatory approaches we do not always identify a key issue but respondents should feel free to provide comments as they wish.

Structure of the report

6. Section 2 discusses issues relating to capital structure and specifically considers the impact of relatively highly geared structures on management incentives and the ability of management to deliver efficient levels of investment. We also deal with questions around the robustness of debt markets and the implications for regulated businesses (including highly geared companies) of possible disruption to these markets.
7. Section 3 discusses how levels of gearing impact on the regulatory framework and the steps regulators have taken to protect consumers from the adverse consequences of high gearing. The first part of this section explains financial ring fencing and the importance of these arrangements in ensuring that regulated businesses continue to have access to debt and equity finance on reasonable terms. Leading on from this we look at whether highly geared structures will restrict a regulator's ability to require companies to fund capital expenditure programmes and set challenging efficiency assumptions. Finally we describe how Special Administration might work and the impact of financial distress on capital expenditure programmes. We discuss the costs of financial distress and on whom these might fall.
8. As context for the debate on proposals for encouraging equity investment, Section 4 recaps on recent developments in the approach to setting price controls and the likely effect of these on the incentives for the equity funding of regulated businesses. Section 5 then discusses the ideas developed by Dr Dieter Helm and Professor Colin Mayer and others for changing the approach to setting price controls and dealing with issues linked to risk allocation, investment incentives and the financing of regulated businesses. An important underlying theme common to these proposals is that of 'regulatory commitment' and how to minimise any unnecessary risk and uncertainty associated with the regulatory treatment of capital investment.

9. Section 6 assesses whether aspects of the present approach to setting price controls make it unduly difficult for licensees to finance their activities. Section 7 discusses options for dealing with these financeability constraints and looks at whether regulators should change their approach to using the metrics used by the credit rating agencies to assess financial robustness. It also considers the ideas on regulatory commitment and how they are relevant for regulators in tackling issues of financeability. Section 8 provides a summary of the key issues for discussion.
10. Professor Keith Palmer has provided advice on the preparation of this paper and he has prepared the foreword setting out his perspective on this paper.

Next steps

11. Views are invited on any aspect of the issues raised in this paper and in particular on the key issues for discussion summarised in Section 8.
12. We intend to organise a seminar before the response period closes to stimulate debate and the understanding of key issues. In the light of the views of respondents and discussion at the seminar, Ofgem and Ofwat will set out how they intend to take this work forward.
13. Ofgem and Ofwat welcome your views on the issues raised in this paper. Please send them by **5 May 2006** to:

Martin Crouch

Director – Electricity Distribution Regulation
The Office of Gas and Electricity Markets
9 Millbank
London
SW1 3GE
martin.crouch@ofgem.gov.uk

Emma Cochrane

Head of Corporate Finance
Office of Water Services
Centre City Tower
7 Hill Street
Birmingham B5 4UA
emma.cochrane@ofwat.gsi.gov.uk

14. Responses to this paper will be published by placing them on the Ofwat and Ofgem websites and so please include any confidential material in a separate annex.

Section 2: The impact of gearing on management incentives and the ability of management to deliver investment

15. Section 2a sets out background information on how regulated businesses (low risk monopoly businesses subject to economic regulation) are financed and their capital structures (i.e. the proportion of debt and equity finance). Section 2b discusses the impact of gearing on the ability of management to deliver efficient levels of investment. Section 2c discusses the possible impact of disruption to debt markets on the investment programmes of companies that rely heavily on debt finance.

Section 2a: Background

16. The optimal capital structure of a firm can be characterised in terms of a trade-off between the tax benefits of debt finance and expected costs of bankruptcy. However the level of gearing of many firms is relatively low and this has led to the development of what is termed the pecking order theory². This characterises decisions on capital structure as a signalling game and suggests that gearing changes in response to the financing needs of a company and its internal resources. According to the pecking order model a firm's first preference will be to finance investment from internal funds (as this signals strong cash flow), its second preference will be debt (as this signals that the providers of debt have confidence in the firm) and its third preference equity (because this can signal that the firm is overvalued or even in distress).
17. The Bank of England (2005)³ regularly reports trends in average levels of gearing for UK firms and has done this since 1970. Measured as the amount of debt as a percentage of trading values (debt plus the market value of equity) gearing is volatile (primarily because of changes in equity values) but averaged around 20 per cent until the middle of the 1990s. Since this time it has increased to around 30 per cent.
18. Regulated businesses are subject to additional constraints and incentives created by the regulatory framework within which they operate. These typically include financial ring fencing arrangements and price controls. Combined with the monopoly characteristics of the underlying business activities these arrangements provide for a high degree of stability in operating cash flow and relatively low levels of business risk. These factors suggest that a regulated business could support a relatively higher proportion of debt finance before the risks and costs of bankruptcy become large.

² For example see Myers and Majluf, Corporate Financing and Investment Decisions when Firms have Information that Investors do not have, Journal of Financial Economics - Issue 13, 1984.

³ Bank of England Quarterly Bulletin, Autumn 2005.

19. At privatisation electricity distribution businesses had levels of gearing (defined as debt to trading value) of around 25 per cent. This level of gearing remained the norm until the leveraged take-overs of a number of electricity distribution businesses in the second half of the 1990s. A number of these licensees now have gearing levels in the range 50 per cent to 70 per cent. The most recent electricity distribution price control review assumed that these businesses would increase capital expenditure by around 50 per cent over the next five years. This is likely to lead to further upward pressure on gearing.
20. The ten water and sewerage companies were floated with relatively little debt but since privatisation the funding requirements of large capital programmes have led to a steady rise in gearing. These capital programmes are projected to increase further over the next five years. The average level of gearing for the sector as a whole is now around 60 per cent and several companies have gearing greater than 75 per cent.
21. More recently the attractiveness of regulated businesses to investors from the financial sector has led to additional pressure from the capital markets to create highly geared structures, particularly among some water, water and sewerage and gas distribution companies. These highly geared companies might have gearing levels of 80 - 90 per cent, although the debt tends to have structural features designed to protect creditors from the costs and risks of the regulated business getting into financial difficulty. These structural features are discussed further in paragraphs 28 and 29 below.
22. The regulators have not prevented these market-led structures, but have observed that they are potentially less financially flexible. The steps that regulators have taken to protect consumers from the adverse consequences of very high levels of gearing are discussed in Section 3.

Section 2b: The impact of high gearing on management incentives and the ability to deliver efficient investment

23. According to the static trade-off theory, capital structure can be characterised in terms of balancing the tax benefits of increasing debt finance against the expected costs of bankruptcy. If gearing becomes very high then the threat of financial distress may either encourage management to:
 - engage in investment which has the potential for high returns but also high risks; or
 - minimise spending and adopt a sub-optimal and low level of investment.

Empirical analysis set out by the Bank of England (2005)⁴ shows mixed results. Its firm level model produced a significant relationship between higher gearing and lower investment but in its aggregate model the relationship is insignificant.

Has gearing risen to a point where there is the threat of financial distress?

24. Credit quality is a key consideration as to whether a company can access the finance necessary to fund its investment programmes. Specialist credit rating agencies assign rating grades to certain borrowers and/or individual debt issues. The three main credit rating agencies are FitchRatings, Moody's Investor Services (MIS) and Standard & Poor's (S&P). Those rating categories that represent the lowest risk are classified as investment grade. Ratings representing higher risk are classified as speculative. The highest investment grade rating is AAA for FitchRatings and S&P (or Aaa in MIS's classification) while the lowest investment grade rating is BBB- (or Baa3 for MIS). In establishing the rating of an entity, a credit rating agency will look at a range of quantitative and qualitative factors, including certain key financial ratios. Credit ratings for licence holders in the water and energy sectors have been on a downward trend since privatisation reflecting the increased level of gearing for these businesses. For example in the mid 1990's the average rating for the water companies was around AA- considerably higher than the current position, described below, for licence holders in the energy and water sectors.
25. As at the end of January 2006 S & P's credit ratings lists⁵ included 30 entities with network licences for energy or water in Britain. The ratings, of which 29 are issuer ratings, comprised 13 electricity distribution businesses, 1 gas transmission and distribution business, 3 electricity transmission businesses and 10 water or water and sewerage businesses. Of these 30 entities two thirds were rated at A- or higher. Of the remainder only three are rated below BBB+ (at BBB). Moody's lists⁶ of the same date included 33 entities with network licences in Britain. Whilst all of these are long-term ratings, Moody's ratings are a mix of issuer, issue and corporate family ratings. Like S&P, all of these are investment grade with around two thirds being rated as A3 or above. Of the remainder, only three are rated below Baa1 (at Baa2). FitchRatings senior unsecured ratings⁷ apply both to issuers and to senior unsecured bonds issued by these companies. All of the 16 licensed network utilities rated by FitchRatings are investment grade again with around two thirds being 'A-' or above. The position described above does not include companies whose ratings are not in the public domain.
26. In terms of a typical firm, the levels of gearing described in paragraphs 19 to 21 above, would be considered very high and its credit quality would probably be relatively low. However, given the stability of a regulated company's cash flows

⁴ Bank of England Quarterly Bulletin, Autumn 2005.

⁵ www.standardandpoors.com

⁶ Source Moody's Investor Service

⁷ Source FitchRatings

(and in some cases the incorporation of structural enhancements – see below) some regulated businesses have been able to adopt high gearing and retain investment grade credit quality. MIS defines investment grade bonds that are rated Baa as medium grade – neither highly protected nor poorly secured. This rating is consistent with a reasonable degree of security and not conditions of financial distress. As interest payments are adequately protected (for the present) there appears no reason why management should be deterred from efficient levels of investment in the short or medium-term.

27. Most regulated water and energy businesses are required by their licences to retain an investment grade issuer credit rating. The financial ring fencing obligations that apply to each licensed business are discussed further in Section 3a.

The impact of structured debt finance

28. In considering its approach to highly-leveraged structures in the water sector MIS has indicated⁸ that debt to regulatory asset value (RAV) levels of 95 per cent may be consistent with investment grade credit quality. This appears to be the upper bound on gearing if a regulated business is to retain an investment grade credit rating. The structures that have emerged have generally contained levels of debt in the range 75 per cent to 85 per cent of regulatory asset value with a variety of rating outcomes but all the ‘corporate-type’⁹ ratings or ratings for debt issued out of these structures have been above the BBB-/Baa3 floor for an investment grade rating. For the ‘corporate-type’ ratings some have been several notches above this floor. There is a wide range of ratings for individual tranches of debt issued out of these structures but all are within the investment grade range. This has depended on the specifics of each transaction. To date the financing arrangements used to achieve these relatively high levels of debt have usually incorporated additional structural features to ensure the retention of an investment grade credit rating. These include giving bondholders rights to limit dividends or take operational control of the business in the circumstances of underperformance. They will also, in practice, limit the company’s ability to engage in higher risk activity.
29. Such structural features can provide important discipline and incentives for management, as well as protecting the interests of bondholders. Following the leveraged take-over of Northumbrian Water in 2003 by Aquavit plc, the credit rating of the appointee fell from A- to BBB+ from Fitch Ratings and from A- to BBB from S&P. This in part reflected the absence of the enhanced creditor protection that would have been provided by enhanced rights for bondholders¹⁰. Nevertheless, there are a number of regulated businesses with gearing levels in

⁸ MIS, The UK Water Sector: Moody’s Approach to Rating Highly Leveraged Structures for Asset Ownership, Rating Methodology February 2001.

⁹ For the purpose of this paragraph ‘corporate-type’ covering corporate issuer ratings, senior unsecured issuer ratings or MIS family rating.

¹⁰ Ofwat, The Completed Acquisition of Northumbrian Water Ltd, Position Paper, August 2003.

of 70 per cent or higher that do not appear to have enhanced creditor protection but still appear to have adequate access to the debt markets.

30. The methodologies used by the credit rating agencies to determine the minimum requirements for an investment grade credit rating will clearly put constraints on the overall level of gearing that a regulated business can maintain. However, they do not appear to prevent a regulated business with a relatively high level of gearing both maintaining that level of gearing and continuing to finance its investment programmes. If such a business was faced with a sharp increase in the requirements for investment, this could be financed in the same proportion as its existing capital structure. The higher levels of capital expenditure would (assuming a reasonable degree of efficiency) be added to the regulatory asset value and so it would attract the allowed cost of capital and, depending on the investment, regulatory depreciation to cover its additional financing costs. If gearing is relatively high this would also mean the requirements for additional equity formation (whether from retained earnings or new issuance) would, in absolute terms, be relatively modest.

Impact on efficiency incentives

31. There might also be advantages – in addition to tax efficiency – from higher levels of leverage. The academic literature includes a number of studies (for instance, Kester and Luehrman (1995)¹¹ and Butler (2001)¹²) that stress the benefits that highly leveraged structures can bring in driving efficiencies in operating and capital expenditures. Some argue that the incentive effects inherent in the price cap regulation would tend to be intensified for a highly geared company because a smaller proportion of equity will benefit from outperformance or bear the risk of underperformance. Nevertheless, it is not clear how this might be expected to affect conduct of the regulated business in a dynamic context. The flexibility to increase gearing may also give companies that are not already highly geared the flexibility to maintain dividends whilst increasing investment.

¹¹ Kester and Luehrman (1995), Rehabilitating the Leveraged Buyout, Harvard Business Review, May-June 1995.

¹² Butler (2001), The Alchemy of LBOs, McKinsey Quarterly, 2001 (issue number 2).

Summary

32. There is no evidence that suggests that present levels of gearing for regulated energy and water businesses have led to sub-optimal levels of investment because these companies have cut back on investment to avoid financial distress. Nevertheless, these businesses are capital intensive and have to make substantial investment in the medium and long-term in order to meet the requirements placed on them. Provided that they are able to retain good credit quality then they should be able to continue to access debt and equity finance.

This is not an area we have identified as a discussion question but respondents may comment if they wish.

Section 2c: Risks and consequences for regulated businesses of disruption to debt markets

Disruption to debt markets

33. A difficulty with relying on debt finance for investment could arise if an exogenous shock significantly reduced liquidity in debt markets, either generally or specifically to regulated businesses. It is not just highly geared companies that require ongoing access to the debt markets. All regulated businesses are likely to require some funding from the debt markets.
34. The underlying creditworthiness of regulated businesses should reduce the impact of these circumstances as it would normally be companies offering poorly secured borrowing that would find it most difficult to access markets. It would also seem likely that an event that significantly reduced liquidity in debt markets would also impact on equity markets, creating difficulties whatever the source of external capital. Over the 20 years since the privatisation programmes of the 1980s, regulated companies have been able to access debt markets to raise substantial additional funds for investment and to refinance existing debt.
35. In the 1990s there were a number of events that had widespread impacts on financial markets including the East Asian crisis of 1997 and 1998 and the Russian crisis of 1998. These events created turbulence in financial markets across the World and led to concerns about the robustness of financial markets. In the UK there was a significant widening of credit spreads on corporate bonds with lower investment grade spreads widening from around the 80 basis points experienced during the mid-1990s to over 150 basis points by the start of 1998. While this created significant uncertainty in debt markets for a number of months, looking at 1998 as a whole the Bank of England concluded¹³ that there had 'been a notably effective contribution by the bond market to meeting the financing needs of the corporate sector'. The key to understanding this apparent

¹³ Speech by the Governor of the Bank of England, 10 February 1999, www.bankofengland.co.uk.

contradiction is the response of the international community to the financial difficulties and the easing of monetary policy. In the UK the yields on Government bonds fell by nearly 200 basis points. This offset the impact of higher spreads and meant that the yields on lower investment grade corporate bonds actually fell from just over 7 per cent to around 6 per cent.

36. The experience would suggest that the financial markets are relatively robust. Nevertheless there may be future circumstances that temporarily disrupt access to debt markets and this could lead to constraints on investment programmes for regulated businesses. In these circumstances, payments to existing capital providers should be covered by price control revenues but future investment would be threatened. Energy and water companies are capital intensive networks and over the medium and long-term investment is critical to their efficient functioning. For water companies the timing of large parts of their investment requirement is governed by legal statute rather than market drivers. For the gas transportation sector there are statutory obligations associated with safety regulations. It would appear that:

- Short-term disruption should be manageable. Asset replacement programmes may only have a modest impact in the short-term on quality of service and other aspects of network performance. If this is the case a constraint on spending in one year can be offset by additional spending in future years with no or modest detriment to the interests of consumers.
- Where the timing of investment is critical to the interests of consumers and in the circumstances where investment cannot be financed from existing cash flow – for instance when expenditures exceed funds from operations (FFO) – then the additional expenditure could be funded from revenue in the year that it is incurred. This option may need to be considered if the period of disruption was prolonged. This would require regulatory approval and agreement by the regulator to re-open price controls. This could be done on the basis that any expenditure funded as incurred would not be added to the regulatory asset value of the business concerned, so that consumers would not pay twice for the same investment. Nevertheless there would be considerable consumer impact and prices could be significantly higher in the short-term.
- Again, depending on the extent of disruption to the debt markets (and an alternative to the regulator re-opening price limits) an option would be for the regulated businesses to renegotiate existing debt repayment schedules and so defer interest payments in order to have cash available to fund investment. However this would not be without cost which ultimately might be borne by consumers if for example this increased the future cost of finance. If the providers of debt finance were not prepared to co-operate with the rescheduling of payments and this meant that companies could not deliver new investment then companies might be in breach of licence obligations. Regulators would need to decide what enforcement action to

take to protect consumers. In the extreme this might lead to the Special Administration provisions being triggered in water or licence revocation in the energy sectors.

Impact on highly geared companies

37. While disruption to the debt markets could be expected to impact on any regulated business, highly geared companies would have less flexibility to finance investment out of earnings because of the need to fund a higher proportion of payments to capital providers as interest payments. Equity funding is based on the present value of future dividends, but generally there is scope to adjust the profile of dividends over time and this can provide an important degree of flexibility for management.
38. Constraints on investment programmes would be more problematic the longer they continue and for businesses where capital expenditure significantly exceeded funds from operations (FFO). However, the evidence suggests that the financial markets are relatively robust and therefore it seems unlikely that regulated businesses will be denied access to debt markets for prolonged periods of time.

Summary

39. It is not possible to rule out short-term disruption to debt and/or equity markets, either affecting access generally or more specifically to regulated businesses. Although equity funding tends to increase the discretion available to management there seems no prima facie evidence to suggest that in terms of raising new finance that equity markets will be more robust than debt markets to events that adversely effect liquidity. However, in circumstances where financial markets are disrupted, less highly geared companies may be in a better position to fund investment by deferring dividends.
40. If the disruption to the markets were prolonged then regulators would have to consider whether it was appropriate to increase prices where necessary to fund a greater proportion of investment on a 'pay as you go basis' from current charges to consumers. This could have a significant impact on consumers in the short to medium-term but would mean less investment to be funded over the longer term through capital charges and a return on assets. Overall consumers would not be worse off, although there could be intergenerational effects.

This is not an area we have identified as a discussion question but respondents may comment if they wish.

Section 3: Gearing and the regulatory framework

41. Section 2 has described the impact of high gearing on management's ability to deliver investment, focusing on the importance of companies maintaining adequate credit quality.
42. The DTI and HMT report (2004) cites arguments by Rao and Moyer (1994)¹⁴ to suggest that high gearing may also impact on regulators' discretion over how they set price controls. DTI/HMT suggest that relatively high levels of gearing may restrict the ability of a regulator to set appropriate targets for cost reduction or transfer risks to consumers/tax payers because of the costs (including social costs) of financial distress. Another concern expressed has been whether it restricts a regulator's ability to require investment by companies over the longer term.
43. When considering individual company's proposals for highly geared structures, Ofwat has observed that these structures are potentially less financially flexible and therefore more vulnerable to the impact of cost shocks. Subject to appropriate ring fencing provisions to protect consumers Ofwat has not stopped these market-led structures. They remain to be tested over the longer term and under a less benign economic environment. Ofwat's approach to the cost of capital and capital structure at the 2004 price review reflected concerns about the lack of track record for the highly geared model and the potential systemic risk for the industry arising from companies that lack financial flexibility. This approach was consistent with advice from Oxera¹⁵ for Ofwat's 2004 price review. In its report Oxera noted that there were company specific factors that suggested that there was no particular level of gearing that could be considered optimal across all water companies and there were questions as to whether lenders were taking proper account of the risks of financial failure.
44. These concerns and the steps that regulators have taken to protect consumers from the adverse consequences of very high levels of gearing are considered further in the following sections:
 - Section 3a discusses financial ring fencing and how it should enable companies to retain sufficient flexibility to fund investment.
 - Section 3b discusses whether highly geared structures restrict the ability of the regulator to require capital investment and set challenging efficiency assumptions.
 - Section 3c describes Special Administration and how consumers are protected if a company encounters financial distress.

¹⁴ Rao and Moyer (1994), Regulatory Climate and Electric Utility Capital Structure Decisions, Financial Review, February 1994.

¹⁵ Oxera (2002), The capital structure of water companies. Available on the Ofwat website.

Section 3a: Financial ring fencing

45. This subsection describes the financial ring fencing licence conditions for regulated utilities and discusses how these arrangements should enable companies to retain sufficient financial flexibility to fund investment.

Financial ring fencing

46. The regulatory framework includes licence conditions that have been put in place to ring fence the regulated business from the activities of the wider group. For many regulated businesses this includes a requirement that they should retain an investment grade issuer credit rating. These arrangements have been designed to reduce the risk of financial distress by constraining the conduct of the company, ensuring its resources are not diverted and that it is not exposed to undue risk. Their presence helps to reassure the regulator that companies remain in a position to finance their functions and consumers interests are not adversely affected by a company's capital structure.
47. There is some variation in financial ring fencing conditions between the energy and water sectors. For instance, although nearly all water licences require an investment grade issuer credit rating only one water company is prevented from engaging in non-core activities. In contrast in energy all the major network businesses have to retain an investment grade credit rating and are prevented from engaging in non-core activities.
48. As discussed in Section 2b, extremely high levels of gearing (perhaps with debt in excess of 100 per cent of RAV) might cause financial distress, constrain investment and make it difficult for regulators to set credible targets for efficiency improvements. However, such levels of debt would not be consistent with the ring fencing provision requiring a regulated business to retain an investment grade credit rating.
49. To date there have been no instances of any regulated energy or water business losing its investment grade credit rating.
50. There have been a number of instances of holding companies losing an investment grade credit rating, for example Enron, the ultimate holding company for Wessex Water and Aquila Energy Partners Holdings, the holding company for Midlands Electricity. Under different sets of circumstances the ring fencing provisions (albeit there are differences in these provisions) enabled the regulated business to access capital markets and retain investment grade ratings, enabling them to be sold as going concerns. In the latter case Ofgem introduced a cash lock-up provision (i.e. restricting the ability of the licensee to pay dividends or make other distributions). A particular tranche of debt, issued by Northumbrian Water's holding company, was downgraded by S&P to sub-

investment grade as a result of the Aquavit acquisition in 2003 but the appointee still remained investment grade.

51. In 2005 Ofgem increased the protections offered by financial ring fencing by formally adding cash lock-up provisions to licence conditions of all gas and electricity distribution businesses and announced its intention to introduce similar conditions in all other gas and electricity network licences. This is triggered when a licensee has the lowest level of credit rating consistent with investment grade (MIS Baa3, and for S&P and FitchRatings BBB-) and a credit rating agency has revised the rating outlook to negative or placed the licensee's rating on review for possible downgrade. In water such provisions are not formally incorporated into licences but for the highly geared companies similar provisions locking cash into the regulated entity form part of the structural features of the debt.

Summary

52. In general financial ring fencing requires licence holders to retain investment grade credit ratings and this implicitly limits the levels of gearing that they can adopt. This should help them retain access to debt markets so that they can fund investment on reasonable terms. In energy all the major network businesses have licence conditions preventing investment in non-core activities, which should limit the scope for investment in high risk ventures and further reduce the risk of bankruptcy. In water while the appointee can engage in unregulated activity¹⁶ in practice any activity of significant value is undertaken by a subsidiary outside the ring fence.
53. These arrangements apply to the licence holder and not the wider group of companies of which it might only be a part. While they have ensured that licence holders have retained investment grade credit ratings they have not prevented the emergence of relatively high levels of gearing for individual companies.

Key issue for discussion (1). Should financial ring fencing arrangements be extended to cover all monopoly businesses and modified so that they all include cash lock-up provisions? How might the introduction of cash lock-up provisions affect existing financial structures including holding company debt? Are the current ring fencing provisions sufficient to allow the activities of the licensed undertaker to be fully separated from other group entities? If not, what additional ring fencing provisions might be appropriate and what might be the costs and benefits of these?

¹⁶ The changes to the conditions of appointment for Dwr Cymru following its acquisition in 2001 by Glas Cymru prohibit it from conducting any business other than the Appointed Business (subject to a 'de-minimis' threshold).

Section 3b: Gearing and its impact on regulators' discretion at price control reviews

54. There have been suggestions that highly geared companies may unduly restrict the discretion available to regulators at price control reviews to require capital investment and set challenging efficiency assumptions. While lower investment might not have a significant impact on consumers in the short-term over a longer period of time it would jeopardise both network security and quality of service.
55. The incentives on the companies to reduce or increase capital expenditure are not necessarily dependent on gearing. In practice RPI-X price controls have been supplemented with additional incentive arrangements and there are other constraints on regulated businesses designed to ensure an appropriate level of capital expenditure. Given the capital intensive nature of most regulated businesses the regulators have developed bespoke incentives and monitoring arrangements for capital expenditure to encompass sharing of cost efficiency, network security, quality of service and asset condition. An assessment of the appropriateness of these arrangements is outside the scope of this discussion paper. Regulators will need to continue to assess the success of current incentive mechanisms already in price controls and whether they need refining in the future. For example Ofwat issued a paper in January 2006 consulting on the length of the review period when it sets price limits in 2009¹⁷. This included discussion of how regulators might take further steps to create a longer term framework for investment.
56. Suggestions to increase the transparency of the regulation of capital expenditure by distinguishing between baseline and incremental capital spending are discussed in Section 5 as one of a package of ideas for reform to regulation suggested by Helm.

Do highly geared structures tend to reduce the regulator's ability to require the licensee to carry out investment and achieve efficiency?

57. Since the late 1990s the main indicators of financial robustness adopted by the regulators when setting price controls have been based on the key financial ratios used by credit rating agencies.
58. For instance the 2004 Electricity Distribution Price Control Review (EDPCR)¹⁸ focused on three ratios in particular and noted that the following target levels would be a conservative indication of the financial characteristics associated with a solid or comfortable investment grade credit rating: (funds from operations/interest payments on debt)>3, (retained cash flow/debt)>0.9 and (debt/RAV)<0.65. FFO is cash flow from operating activities minus tax

¹⁷ Ofwat, Setting water and sewerage price limits: Is five years right?, January 2006.

¹⁸ Ofgem, Electricity Distribution Price Control Review – Final Proposals, November 2004.

payments and retained cash flow (RCF) is cash flow from operating activities minus interest, tax and dividends.

59. In its March 2004 analysis of gas distribution companies¹⁹ MIS puts rather more emphasis on ratios of FFO interest coverage adjusted for regulatory depreciation (MIS says that this on the basis that regulatory depreciation is a reasonable proxy for maintenance capital expenditure). Similarly MIS emphasises the importance of ratios adjusted for regulatory depreciation when rating the water companies. FitchRatings takes a related but different approach in calculating adjusted FFO interest coverage in that FFO is adjusted by capital maintenance expenditure rather than regulatory depreciation.
60. Ofwat used a basket of indicators to assess companies' ability to raise capital on reasonable terms which are set out in its Final Determination document²⁰. This basket included all of the ratios set out in paragraphs 58 and 59 above.
61. In the financial modelling completed as part of the price control review regulators have tended to assume that the regulated business has a capital structure consistent with the assumption on gearing used in setting the cost of capital. Typically this has meant gearing in the range 50 per cent to 60 per cent. These levels of gearing are below the levels consistent with minimum investment grade credit ratings and the levels of gearing observed in some of the most highly geared regulated businesses.
62. As such the levels for the financial ratios used by the regulators when setting price controls are significantly more conservative than those associated with the minimum level for an investment grade credit rating. In setting price controls regulators have tended to focus on financial ratios that indicate a solid (or comfortable) rather than minimum investment grade credit rating. This provides regulated businesses with a degree of flexibility in deciding on financial structure.
63. Given that the financial modelling is driven by an assumed level of gearing, a company's actual level of gearing will not place a direct constraint on the outcome of a price control review either in terms of investment required or how efficient the companies need to be. Nor do regulators consider that it needs to do so in the future.

¹⁹ MIS, UK independent gas Distribution Companies, Rating Methodology March 2004.

²⁰ Ofwat, Future water and sewerage charges 2005-10 – Final determinations, December 2004.

Summary

64. Since privatisation regulators have recognised the importance of enhancing incentives for efficient capital expenditure and assessing whether the projections made at price control reviews are consistent with a reasonably efficient company being able to finance its activities.
65. It will be important for regulators to continue to work with licence holders and other stakeholders to improve further the incentives for efficient capital expenditure. In this context it is also appropriate to consider how to develop further the longer term framework for dealing with investment.
66. The financial modelling carried out at price control reviews is conducted on the basis of an assumption on the reasonably efficient level of gearing rather than actual gearing. Therefore, highly geared structures have not constrained the analysis carried out as part of the price control reviews. Companies' actual capital structures and their associated covenants did not directly influence Ofwat's and Ofgem's price determinations nor do the regulators consider that they need do so in the future.

This is not an area we have identified as a discussion question but respondents may comment if they wish.

Section 3c: Special Administration

67. In this subsection we consider how a company's capital structure might affect its exposure to exogenous cost shocks or difficulties created by inefficiency and therefore the possibility of financial distress. It describes the arrangements for Special Administration in the energy and water sectors and how consumers are protected if a company encounters financial distress.

Circumstances leading to financial distress

68. All companies are exposed, to varying degrees, to the risk of financial distress. However given the sophistication of debt markets and detailed nature of the appraisals carried out by credit rating agencies and others, and the relatively transparent nature of the regulatory process, it would seem that the providers of debt finance should be able to understand the financial and operating performance and associated risks of regulated businesses. In the light of these considerations it would appear unlikely that providers of debt finance would advance funds to a regulated company to such an extent as to put the business on the brink of financial distress. This is supported by empirical evidence that suggests that credit ratings are a relatively good predictor of the probabilities of default. The companies that have higher levels of gearing are all investment grade. The ring fencing provisions and in particular the requirement on

licensees to retain an investment grade credit rating, limit the scope for group debt to be loaded onto a regulated subsidiary.

69. Nevertheless, the providers of debt finance might think that a regulator's duty to ensure that a regulated business can finance its activities will protect bond holders from the costs of financial distress. To the extent that there is remaining ambiguity over these matters it is helpful to clarify:
- that interpreting a regulator's duties as enabling licence holders to finance their activities in a way that encouraged operational or financial inefficiency would not be consistent with duties to protect consumers. Therefore duties have consistently been interpreted by regulators and accepted by other stakeholders in terms of providing a stable framework for a reasonably efficient company to earn a return at least equivalent to its cost of capital and not that inefficient companies should always be able to earn a return equivalent to their cost of capital;
 - if a company ends up in financial distress either because of a relatively poor operating performance or because of its decisions on financial structure then the regulator would regard these as costs that should be borne by the providers of debt and equity finance rather than consumers;
 - in the event of a cost shock causing several companies to end up in financial distress (systemic failure), the Special Administration provisions should be expected to protect consumers from the effects of multi-company failure; and
 - even if the failure of a regulated business were to cause wider disruption to debt markets the longer term interests of consumers would suggest that a regulator should not take action to subsidise the providers of debt finance.
70. This should assist in ensuring that providers of debt finance do not advance funds to a regulated business in the erroneous belief that they would be supported by the regulator in circumstances of financial distress and provide a powerful incentive for capital providers to mitigate against systemic risk by e.g. developing structural enhancements to debt.

Financial distress and Special Administration

71. There remains a possibility that either an unanticipated downturn in operational performance, exogenous cost shock or an event impacting on debt markets could push regulated businesses to the edge of what might be regarded as acceptable for an investment grade credit rating or even into financial distress. Companies' exposure to unanticipated cost shocks is limited to the extent that there are regulatory mechanisms that can be used to deal with them for example in the water sector the interim determination and substantial effect mechanisms. Nevertheless these mechanisms are not designed to subsidise inefficiency and in the case of a downturn in operational performance then the difficulties may be particularly acute because a relatively inefficient company may find it difficult to take corrective action.

72. It is quite probable that in the event that a company was heading towards insolvency that creditors and shareholders (because it would be in their interests) would seek out a market solution to rectify the situation. For example, this is what happened when Hyder plc encountered financial difficulties triggering a chain of events which eventually saw Hyder's electricity distribution and water and sewerage businesses acquired by Western Power Distribution.
73. It is also worth observing that one of the structural features associated with the more highly geared companies is the so-called 'Standstill Arrangements' whereby individual creditors cannot petition for insolvency giving a 'breathing space' for creditors to collectively look at options for resolving financial difficulties. If the circumstances were sufficiently serious none of this would stop the regulator or Secretary of State seeking to appoint a Special Administrator if they thought it appropriate in order to protect the interests of consumers.
74. Measures to protect continuity of service in the water, rail and energy sectors were taken in the Water Industry Act 1991, the Railways Act 1993 and the Energy Act 2004 respectively. These contain provisions that allow the Secretary of State (or the regulator with the permission of the Secretary of State) to apply to the High Court to appoint a Special Administrator. The High Court will only make such an order if certain conditions are satisfied, including that the company is (or is likely to be) unable to pay its debts. Other circumstances that might lead to the appointment of a Special Administrator in the water sector include breach or potential breach by a company of its duties. The objectives of Special Administrators include securing that the licence holder continues to develop an efficient and economical network (or in the case of the water industry to maintain supplies) and that the company is either rescued as a going concern or that its activities are transferred to another company as a going concern.
75. As noted above, highly geared companies might be more vulnerable to exogenous costs shocks or difficulties created by inefficiency because of more limited financial flexibility. However, as explained above, the structural features associated with higher levels of debt finance might reduce the probability of the creditors of a highly geared regulated business petitioning for conventional administration. However, to date, these mechanisms remain untested.

Would financial distress lead to higher costs for consumers or tax payers?

76. Whether financial distress would lead to higher costs for consumers or tax payers will depend on how the Special Administration provisions work in practice and the response of the regulator to the circumstances of Special Administration. Apart from the rather special circumstances of Railtrack these processes and interrelationships are untested.
77. As well as ensuring continuity of service, the Special Administrator must transfer or rescue the business as a going concern. Regulated businesses typically have substantial physical asset bases (ranging from around £0.1 billion

to over £8 billion). This should allow the providers of finance to meet the one-off costs of administration and any costs associated with inefficiency out of the realisation proceeds without jeopardising the ability of the Special Administrator to refinance the business as a going concern. Any proceeds net of these costs would be passed to investors but there is no guarantee that they would recover their investment in full.

78. The successor company would be subject to the price controls applicable to the original company. The charging structures already in place should ensure that the new company is able to generate sufficient revenues going forward. An analysis of the 2004 electricity distribution price control review (which allowed for an approximate 50 per cent increase in capital expenditure over that spent in the previous price control period) indicates that 11 out of 14 electricity distribution companies are able to fund their capital expenditure requirements from the allowed return on capital (excluding tax) and regulatory depreciation for each and every year of the price control period.
79. Even where there is considerable pressure on cash flow (as is the case for the water companies) price control revenues allow for sufficient revenue to finance the requirements of an efficient business, including capital investment, going forward.
80. However it is not possible to rule out the possibility that a regulator may be asked by the Special Administrator to consider a case for re-opening price limits. In water the licences provide for price limits to be re-opened to deal with substantial adverse effects that could not have been avoided by prudent management or favourable effects not attributable to prudent management action. Although there is no such specific mechanism in energy, it would be open to the licence holder at any time to request an interim review in light of material changes in circumstance and the regulator would be bound to consider such a request. In making any changes to price limits, regulators will want to ensure that it is investors not consumers that would be expected to bear the costs arising from inefficiency.
81. While this may not have been the case with Railtrack the circumstances of the railway industry would appear to be *sui generis*, given the events of Railtrack's Special Administration and that the industry continues to rely on public subsidy to finance its activities.

Summary

82. Special Administration is important as it should ensure that consumers receive continuity of service if a regulated business goes into insolvency. In addition, Special Administration protects consumers from price increases where the collapse of a highly geared or other structure is triggered by inefficiency or avoidable cost shocks. This would apply even if such a collapse were to trigger wider disruption to debt markets.

This is not an area we have identified as a discussion question but respondents may comment if they wish.

Section 4: Recent changes to the approach to setting price controls

83. This section describes the refinements to the approach to setting price controls determined in 2004 and changes to the incentives for the provision of debt and equity finance that these refinements should create. This provides context for suggestions as to how regulators might increase regulatory commitment and the proposals for further encouraging equity investment.

The new price controls

84. As explained in Section 3b, in setting price controls Ofwat and Ofgem used a generic gearing assumption in calculating the cost of capital and as the basis for modelling companies financial projections.

Incentives for debt finance – treatment of tax

85. At the 2004 price review Ofgem brought the treatment of tax closer to that used by Ofwat. In previous reviews Ofgem calculated the cost of capital assuming a level of gearing characterised as reasonably efficient and included a generic tax wedge designed to allow the regulated business to fund corporation tax.. In the 2004 EDPCR Ofgem explained that it had used the same assumption on level of gearing (about 60 per cent) for all companies in setting the cost of capital and in the financial modelling of the regulated businesses. Further, if a regulated business were to exceed this threshold and incur extra interest costs over the price control period, Ofgem would seek to claw back for consumers the tax savings associated with the additional interest costs at the next price control review.
86. Ofwat has, in all its reviews, separated the treatment of tax from the cost of capital instead including tax as a company specific cost. Therefore at PR04 companies' tax allowances were based on their actual projected levels of gearing, not the generic level assumed for the purposes of setting the cost of capital. Future tax savings arising from gearing up during the price limit period will be passed to consumers at the next review.
87. Finance theory suggests that as gearing increases then there is a trade-off between the advantages of tax efficiency and the expected costs of bankruptcy. In this context the change in approach (clawing back the tax advantages of interest costs) should reduce or eliminate the incentives for a regulated business to increase gearing above the target level used at the price control review just for tax benefits without considering wider issues. While this represents an important factor in the discussion to adopt relatively high levels of gearing, it does not remove incentives to minimise the costs of corporation tax as tax efficiency has a number of dimensions, not just the level of gearing and

interest costs.

88. It is important to note that these arrangements only apply to the licensed entity. Therefore, the licence holder can be owned by a holding company that could carry additional debt and that owner would continue to benefit from the tax shield that the interest payments on this debt would generate. In general there are no regulatory restrictions on holding company gearing or requirements for holding companies to retain investment grade credit ratings. Nevertheless credit rating agencies may take the credit quality of the wider group into account when rating a regulated entity, particularly if the debt is being serviced from the cash flows of the regulated business.
89. This approach could displace debt from the licence holder to the holding company. Provided that the financial ring fencing arrangements are robust to financial difficulty elsewhere in the group then the expected costs of financial distress to the regulated business should be minimised. The holding company of the regulated business then internalises the trade-off between the advantages of tax efficiency and the expected costs of financial distress.
90. A characteristic of this approach is that while it should ensure that a regulated business carries a higher proportion of equity finance than the group as a whole the equity finance in the regulated business can be manufactured by the group issuing debt from a holding company. Any different incentive properties that equity finance might have in comparison to debt finance might be destroyed by such financial engineering and where there were concerns about the impact on the consumer regulators would need to look at this carefully.

Equity incentives

91. The 2004 reviews also increase the returns to equity finance used in calculating the overall cost of capital. When assessing the allowed cost of equity both Ofwat and Ofgem looked at a wide range of evidence. Work undertaken by Smithers & Co Ltd²¹ pointed to evidence on the long run total market returns being fairly stable over time and across different markets and in the estimated range 6.5 to 7.5 per cent (arithmetic average). Both the regulators' costs of equity fall in this range. The regulators assumed that the businesses for which they were setting price controls were market average risks (i.e. assumed an equity beta of 1 under a CAPM-based framework). The regulators overall approach to setting the cost of capital was in a context of encouraging equity formation and enabling efficient companies to maintain stable credit quality going forward in the light of the capital programme required. The regulators also considered other evidence including the ratio of market to asset valuations and evidence from transactions involving the sale of regulated businesses.

²¹ Smithers & Co Ltd (2003): A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the UK. Available on www.ofwat.gov.uk.

92. It is too early to judge the outcome of the reviews but companies are able to access the capital markets and they are establishing strategies to deliver investment and what Water UK²² has described as the tough challenges presented by the PR04 final determinations.
93. In both energy and water the enterprise values of most companies are now exceeding regulatory asset values and transactions in both the water and gas distribution sector have taken place at premiums to RAVs. This market evidence now points to equity investors being more comfortable with the regulatory framework and that they appear adequately compensated for the risks associated with investing in regulated businesses.

Summary

94. The most recent price control reviews by Ofwat and Ofgem clarified incentives with respect to high levels of gearing for regulated businesses and companies should understand that regulated revenue will be adjusted to remove the tax advantages from a licensed company adopting a relatively high level of gearing. These reviews also increased the returns to equity finance used in calculating the overall cost of capital. The water sector is now trading at a premium to RAV and in the water and gas distribution sectors there have been a number of transactions at a premium to RAV. The recent changes to the regulatory regime noted above have strengthened the incentives for equity financing.

This is not an area we have identified as a discussion question but respondents may comment if they wish.

²² Barrie Clarke Water UK, PR04 is still a tough call, in *Water and Water Treatment*, January 2005 – Volume 48 – Issue 1.

Section 5: The suggestions made by Helm and Mayer

95. This section reviews the ideas developed by Helm and Mayer for changing the approach to setting price controls and dealing with issues linked to risk allocation, investment incentives and the financing of regulated businesses. A common element of these proposals is that, given the likely scale of investment required by regulated companies, regulators should be looking at ways of reducing risk to allow for the efficient funding of capital investment.
96. Some of these ideas were published before the final proposals made by Ofgem and Ofwat for price controls in 2004 although Helm has published further papers on these matters subsequently. The incentives for equity and debt finance created by the 2004 price controls are discussed in Section 4.

Changes to the regulatory framework suggested by Helm

97. Helm's overall framework for regulation is underpinned by an analysis of risk allocation. Helm (2006)²³ sets out the background to his thinking on efficient risk allocation:
- risk is best allocated to those best able to manage the risk. In the case of managing the operation of a business (including carrying out new investment) then these are best dealt with by equity investors and their managers;
 - political risk should lie with government and regulatory risk should lie with regulators who could adapt their approaches to reduce regulatory risk;
 - once investment is sunk, i.e. is confirmed in companies' regulatory asset values, then consumers are best placed to enable companies to recover these costs (through near certain allowances allowed by regulators for returns in companies' price controls). This requires regulators in turn to provide a much clearer 'commitment' to RAVs, i.e. there needs to be much greater clarity on the rules for inclusion of capital in RAVs. If consumers do not provide sufficient revenue (for whatever reason political or otherwise) companies' RAVs should be underpinned by taxpayers;
 - regulated businesses tend to have political risks because they provide essential services. This can result in a significant premium in the cost of finance if political risk is borne by capital providers;
 - changing the financial structure of a regulated business does not by itself change the underlying risk. Equity risk does not go away;
 - the regulatory framework influences the allocation of risk between consumers, providers of capital and sometimes tax payers.

²³ Dieter Helm (2006), Ownership, Utility Regulation and Financial Structures: An Emerging Model, 14 January 2006. Available at www.dieterhelm.co.uk.

98. He describes a 'gradual revolution' in the ownership and financing of utilities and infrastructure, in terms of a move away from the equity dominated models of the 1980s and 1990s towards highly geared structures. He categorises these new structures as follows:
- the 'dash for debt' in the conventional equity framework;
 - debt only companies;
 - private equity in partnership with pension fund investors; and
 - floated equity funds.
99. Helm has reservations about the 'dash for debt' in the conventional equity framework, as assumed by regulators when setting price controls, because he says this has led to regulators allowing for higher returns to support interest coverage (he has previously described this as 'exhausted balance sheets'). He criticises the 'debt only' companies because of the lack of efficiency incentives. He is more positive about private equity partnerships and floated equity funds but notes that whether these entities will have optimal financial structures depends on the approach to regulation.
100. Helm (2003)²⁴ suggested a number of changes to the regulatory framework including the treatment of capital investment and in particular the introduction of a split cost of capital. Once investment has been added to the RAV he suggests it is relatively low risk and is suitable for debt finance. On this basis he suggests the RAV should attract a relatively low cost of finance. He suggests that managing the day to day operation of the business and project managing new investment is higher risk (as there are added uncertainties around procurement, project management and whether outturn expenditure is fully reflected in the RAV) and so should attract a higher return consistent with the provision of equity capital.
101. Helm (2006) develops these ideas further and suggests that, combined with measures to reduce the risk associated with financing the RAV, a split cost of capital could lead to a position where the regulatory framework would:
- allow RAVs to be financed by very low cost debt and if investors' perceptions of regulatory stability could be enhanced and returns on the RAV subject to an appropriate guarantee (e.g. by indexing them somehow to market outcomes) then it would be possible to move the cost of debt finance toward the levels of returns available on government gilts. He notes that the returns on longer term bonds have reached historical lows, with the UK 50-year index-linked gilt trading at a real return of below 1 per cent;
 - provide for equity funding where it would be appropriate and its incentive properties best utilised in terms of managing operating and construction risks.

²⁴ Dieter Helm (2003), *Whither Water regulation*, in Helm, *Water, Sustainability and Regulation*, Oxford: Oxera, May.

102. Helm believes that overall his package of reforms would result in a lower cost of capital for regulated businesses (and so lower bills for consumers than otherwise would be the case) because a very significant proportion of the business would be funded by debt finance. In his analysis he recognises that the cost of equity, for the risks involved in operating the business, would need to be higher than currently allowed by Ofwat and Ofgem and more akin to those required by service providers.
103. Helm's 2005²⁵ paper introduces the idea of indexing the cost of capital using appropriate market indicators e.g. for debt financing using current bond yields. This would differ from the existing approach where regulators set the cost of capital every five years. He suggests that this would reduce the regulatory risk created by the interaction of the current five-year price control cycle and regulated businesses needing to finance investment over a longer time scale.
104. Alongside his thinking on risk allocation and implications for how companies should finance investment and to complete his package of regulatory reform, Helm suggests that regulators should separate out the determination of companies' capital investment programme from the current five-year price determinations. He argues this would allow the capital programme to be set in a much longer framework (with greater reliance on regulatory mechanisms designed to cope with uncertainties) and the focus of periodic reviews being on the costs of operating regulated businesses.
105. He accepts that a consequence of his proposals would be 'relatively highly geared companies' with the actual level of gearing depending on the investment requirements placed on the company and the form of regulation adopted. This paper has already discussed issues arising from the fact that these structures may, to some extent, be more exposed to exogenous cost shocks and disruption in financial markets.
106. Taken together, Helm suggests that his proposals strengthen incentives for efficient investment by explicitly and more accurately reflecting the marginal cost of new investment and providing heightened incentives for managing the risks around new investment. Because of the lower allowed cost of debt finance he suggests that it would also weaken incentives to inflate the RAV with inefficient investment.

²⁵ Dieter Helm (July 2005), Unfinished business – regulatory reform, Monthly commentary. Available at www.dieterhelm.co.uk.

107. Helm's proposals raise important issues and highlight the advantages of minimising any unnecessary regulatory risk and allocating risk in an appropriate way. Nevertheless the details of these proposals require careful consideration:
- It is desirable in economic terms to allocate political risk to the most appropriate stakeholder. If political risk rests with the companies then this will result in a premium to the cost of capital that ultimately would be detrimental for consumers. It is therefore in consumers' interests for government to minimise political risk;
 - Existing regulatory frameworks provide important protections to ensure that individual company structures do not transfer risk to consumers;
 - It would be important that any further reassurances to investors in relation to RAVs did not undermine incentives for efficient investment;
 - In order to assess the impact of these proposals on the cost of capital it is necessary to understand: -
 - The implications for companies' capital structures. Given that under these proposals the equity risk is contained to operating the business and delivery of the capital programmes, this could form a low proportion of the capital required in these businesses. This could result in levels of gearing significantly higher than observed to date and perhaps even higher than the MIS 'threshold' of 95 per cent for investment grade rating. Current market evidence suggests that a lower level of gearing may be required to absorb the risk entailed in operating regulated businesses than might strictly flow from Helm's proposals.
 - The cost of equity to such a business. To the extent that these proposals transferred risk, rather than reduced risk, the overall cost of capital would not be reduced. Helm does not specifically identify what the cost of equity might be under his proposals. But the equity returns required on operating the business (including delivering new investment) may need to be sufficiently high such that they could offset some of the advantages of the lower cost debt finance.
 - The implications for companies financeability;
 - There may be practical issues associated with the proposal that once capital expenditure is "sunk" in the RAV, it enables regulators to assume that capital provided by equity investors can immediately be replaced by debt;
 - The proposals may lead to a reduction in the flexibility available to regulated businesses by driving them to take on essentially a mechanistic approach to capital structure. The present arrangements allow for a degree of differentiation in capital structures which has allowed for innovative financing structures;
 - On the proposal for indexing the cost of capital based on market outcomes whilst this might reduce uncertainty about the amounts allowed in price limits for financing costs it would tend to transfer more of the risks arising from market volatility immediately to consumers;
 - Regulators are already looking at ways in which the regulatory approaches can better serve long-term outcomes.

108. In considering whether further steps can usefully be taken to improve risk allocation in regulated businesses, including the introduction of a split cost of capital, regulators must take care to ensure that any such changes do not unnecessarily increase perceptions of regulatory uncertainty and risk. These matters require careful consultation with the regulated businesses and other stakeholders.

Changes to setting price controls suggested by Mayer (2003)²⁶

109. Mayer (2003) discusses the evolution of price control regulation in the water sector since privatisation. He characterises the position in the years after privatisation as an 'easy money period' with relatively generous price controls and high returns. The 1999 water and sewerage periodic review created much more demanding efficiency targets. He goes on to suggest that companies responded to these challenges by significantly increasing gearing – both to lower their cost of capital (by increasing tax efficiency) and to restrict the ability of the regulator to further tighten the approach used in setting price controls.
110. The arguments put forward by Mayer on the cost of capital are not contentious. However as already discussed in Section 3, whether companies increased gearing in an attempt to reduce regulatory discretion is less clear. It can be plausibly argued that the 1999 review increased transparency and regulatory certainty and so provided the ideal trigger for companies to take advantage of the tax efficiency of debt finance.
111. He argues that high levels of gearing reduce the commitment of licence holders to the licensed operations and of the regulator to the license holder because under this model the scope for both parties to exit are greater. In his view this creates a potentially greater incentive for under-investment because the existing licence holder has a credible option to exit the industry.
112. Mayer (2003) goes on to develop arguments that there may be a divergence between the private and social costs of gearing in that the failure of a regulated business may have wider social costs. The discussion in Section 2 indicates that debt markets are relatively robust and any wider costs to consumers of disruption in the short-term should be relatively small. Subsection 3c notes that highly geared companies may be more vulnerable to exogenous cost shocks because of more limited financial flexibility and explains the additional protections for consumers provided by Special Administration. Mayer (2003) also suggests that there is an inherent mismatch between the commitment that investment in regulated businesses requires and that which regulators and governments can provide.

²⁶ Mayer (2003), Commitment and Control in Regulation: The Future of regulation in Water, Paper by Colin Mayer for the 2003 Beesley Lectures on Regulation.

113. A solution put forward by Mayer to some of the difficulties that he identifies is that regulators should front load returns which he believes would increase the credibility of regulators' commitments to the equity model.
114. Mayer's proposals highlight the importance of having appropriate incentives for investment and sufficient regulatory commitment to encourage regulated businesses to retain an appropriate level of equity finance. Nevertheless, the details of the proposal require careful consideration:
- In light of the recent developments to price controls described in Section 4 it is not clear of the extent of the evidence of a lack of regulatory commitment to equity funding;
 - It would appear that the structural features of debt finance and arrangements for Special Administration should provide substantial protection for consumers from the social costs of leverage; and
 - The solution put forward by Mayer of front loading returns has a similar effect on cash flow to accelerating depreciation. This option has already been used by Ofgem and is discussed further in Section 7.

Regulatory commitment

115. As Keith Palmer has highlighted in his Foreword to this report a common theme of the current proposals for regulatory reform, including those of Helm and Mayer above, is how regulators deal with the issue of regulatory commitment. The issue arises because there is an inherent timing mismatch between the current five-yearly price setting cycle and the much longer timeframe for financing regulated businesses. Uncertainty in the financial markets about future price control reviews and the allowed cost of capital tends to increase the regulatory risk premium in the cost of capital.
116. Given that the capital expenditure programmes of regulated businesses can extend out over many years it is important to consider whether additional flexibility is required in the price control review process to deal with these timing issues.
117. One way of dealing with the issue might be to lengthen the period for which price limits are set. This assumes, however, that there is some certainty about future capital programmes – a situation that has not occurred since privatisation. It might also require regulators to revisit the existing mechanisms by which price limits can be adjusted between reviews. If the review period were to be lengthened materially a further important question is whether (as Helm has suggested) the allowed cost of capital would need to be indexed to adjust for intra-period changes in financial market conditions. As already mentioned in paragraph 55, Ofwat has issued a consultation paper asking for views on the appropriate period for price limits to be set in 2009. Both Ofwat and Ofgem, in planning for the next price control reviews, are looking at how the regulatory

framework can best serve long-term outcomes including the treatment of projects that might span review periods.

118. Another way of increasing regulatory commitment, and in doing so promoting investor confidence, could be for regulators to consider setting the cost of capital for a longer period than the current five-year norm. This could be one way of providing companies and their investors with certainty on revenues for a longer period. A relatively radical change would be to set allowed revenues in respect of depreciation and the cost of capital over the life of the asset being financed. This should reduce regulatory uncertainty and therefore lower the cost of capital. However companies may react by locking in their financing costs for a matched term, in order to avoid risk, even if this denies them refinancing opportunities in the future.

Summary

119. There are a range of ideas for changing the approach to regulation, in particular setting the cost of capital and dealing with the issue of regulatory commitment, which warrant consultation. This chapter has focused on the proposals put forward by Helm and Mayer but has also touched on a number of other possible approaches including the idea that regulators could fix the cost of capital for longer – up to and including the life of the investment.
120. The ideas for dealing with the issue of regulatory commitment are also important to the discussion of alternative approaches to financeability in Section 7.

Key issue for discussion (2). Would the separation of past and future capital investment improve the incentives for investment, lower the overall risk of regulated businesses and reduce the cost of finance? Are there any practical implications if such an approach was adopted?

Key issue for discussion (3). Is there any evidence of a lack of regulatory commitment to regulatory asset values or equity funding and if so how might this be best rectified?

Section 6: Setting price controls and issues of financeability

121. This section discusses why regulators have faced financeability issues in setting price controls. It sets out some illustrative calculations from the water sector to demonstrate financeability constraints and discusses the approaches that regulators have adopted to dealing with these issues in recent price control reviews.
122. Ofwat and Ofgem have statutory duties that relate to allowing licensees to finance the proper carrying out of their functions ('finance functions'). Since privatisation many regulated businesses have been required to undertake and finance very large programmes of capital investment. As discussed earlier in this paper this has been one factor in the significant rise in the gearing of regulated businesses.
123. As Section 3 explains not all capital investment is recouped from consumers in the year in which the company incurs the expenditure. Some capital expenditure is added to the RAV with the price control allowing the recovery of regulatory depreciation and a return on investment. This approach enables companies to finance investment from debt or equity providers and spreads the cost of investment to consumers over the lives of the asset.
124. Capital expenditure can also be financed through an infrastructure renewals charge and be broadly recovered in the year that it is incurred. Infrastructure renewal charges are used in the water sector to allow for the capital expenditure necessary to maintain the serviceability of underground assets and in the gas distribution sector to provide some of the funding for gas mains replacement programmes.

What has given rise to difficulties with financeability?

125. Ofwat has described financeability in terms of ensuring that, if reasonably efficient, a company's revenues, profits and cash flows should allow it to raise finance on reasonable terms in the capital markets²⁷. In practice financeability issues arise from a number of inter-related factors.
126. Where the level and treatment of capital expenditure (including the approach to depreciation) is such that the RAV increases quickly over time then significant new injections of debt or equity finance will be required in order to finance the purchase of fixed assets. In setting price controls Ofgem and Ofwat have assumed that when such circumstances arise most of the new finance comes from debt. Generally this reliance on the debt markets has been mirrored in companies' actual financing strategies. This tends to lead to pressure on key

²⁷ Ofwat (December 2004), Future water and sewerage charges 2005-10, Final determinations.

financial ratios (such as interest coverage) that are used by credit rating agencies to assess companies' credit quality.

127. A further characteristic of the present approach to setting price controls is that they have been set to enable companies to earn their real cost of capital. This approach compensates for inflation by increasing the RAV over time by the RPI.
128. Providers of equity finance generally accept compensation for inflation via real dividend growth and the increase in equity provided by the inflation of the RAV. However, providers of debt finance generally require compensation for inflation via interest payments based on nominal interest rates. The consequence of this, combined with the regulators' approach for compensating for inflation, is that there can be cash flow timing differences between the allowed return in price limits and companies' payments to investors. Although the regulator allows sufficient revenue to finance capital expenditure over the economic life of the asset, the absolute value of the return on the RAV in any specific year may not be sufficient to pay both nominal interest costs and full distribution of the real cost of equity through dividends. This cash-flow gap puts further pressure on companies' financial projections.
129. However, in the absence of further significant capital expenditure requirements the cash flow timing differences will unwind over time and pressure on credit quality will be eased. To the extent that measures of credit risk used by lenders and rating agencies emphasise short-term financial ratios (driven by uncertainty with regard to future cash flow beyond the current price review period) then this may exaggerate the apparent credit risk over the full life of the borrowing.

Illustrating the financeability issue

130. The following figures and tables illustrate the financeability issue for a stylised company in 'steady state' (figure 1 and table A) and then this company having to undertake a capital programme (figure 2 and table B) – the 'base case'. They use the assumptions for debt, equity and asset lives that Ofwat employed at its last price review in 2004. The company is initially 55 per cent geared with a real cost of debt of 4.3 per cent and a cost of equity of 7.7 per cent (consistent with that used to calculate the weighted average cost of capital). It also assumes that there is some equity retention i.e. the dividend yield is modelled at 5.8 per cent real compared to the allowed real cost of equity of 7.7 per cent. As a consequence of these assumptions the amount of equity invested in the business (via retained earnings) is assumed to grow at the rate of real dividend growth (i.e. 1.9 per cent per year). These assumptions are tabulated below each relevant table.
131. Figure 1 illustrates a regulated company in steady state (where regulatory depreciation is equal to annual capital expenditure). Because the RAV is stable in real terms and the level of equity invested in the business is assumed to grow each year (in line with dividend growth) then the proportion of debt finance or gearing declines over time. The level of revenues increases more quickly than

interest payments and debt based ratios improve over time. In these circumstances, despite the company being unable to pay both nominal interest costs and maintain its real dividend yield from the value of the allowed return (see figure 1), it is unlikely that debt based financial ratios will act as a constraint on the regulator in determining price control revenue. This impact on ratios is illustrated in table A. The ratios used throughout Section 6 and Section 7 are for illustration purposes only and do not represent a definitive package of indicators nor do the target levels used represent a floor used by Ofwat or Ofgem at price determinations.

Figure 1

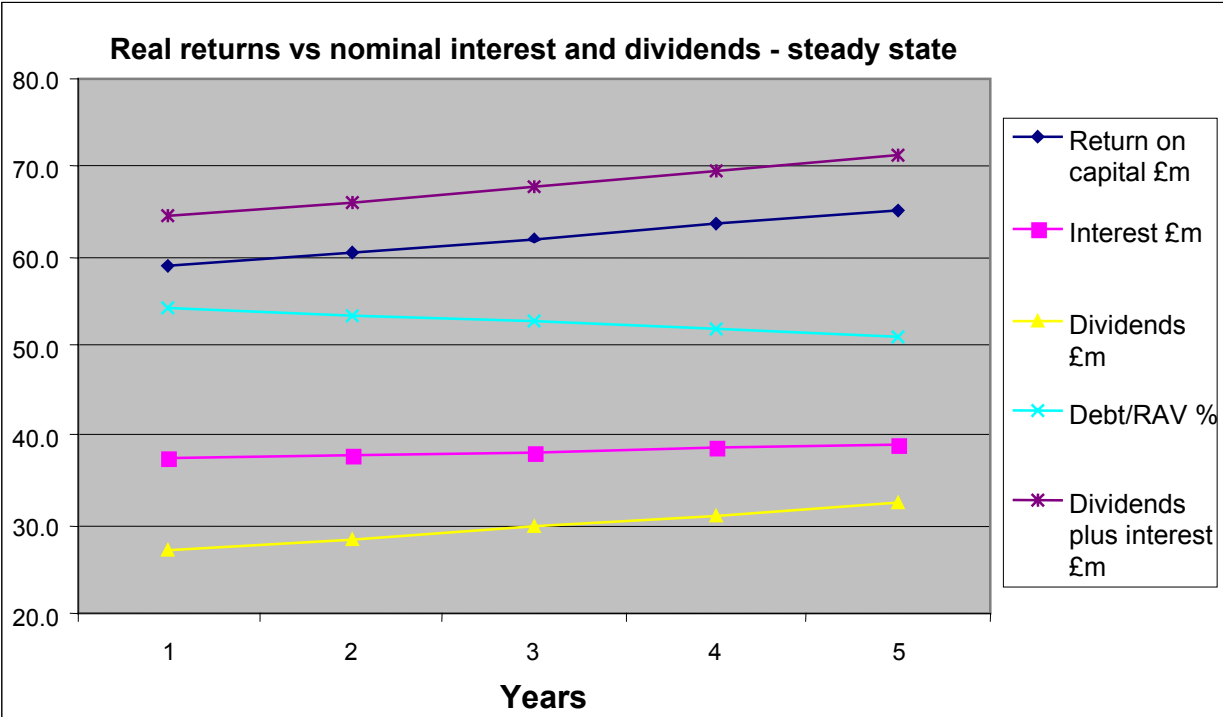


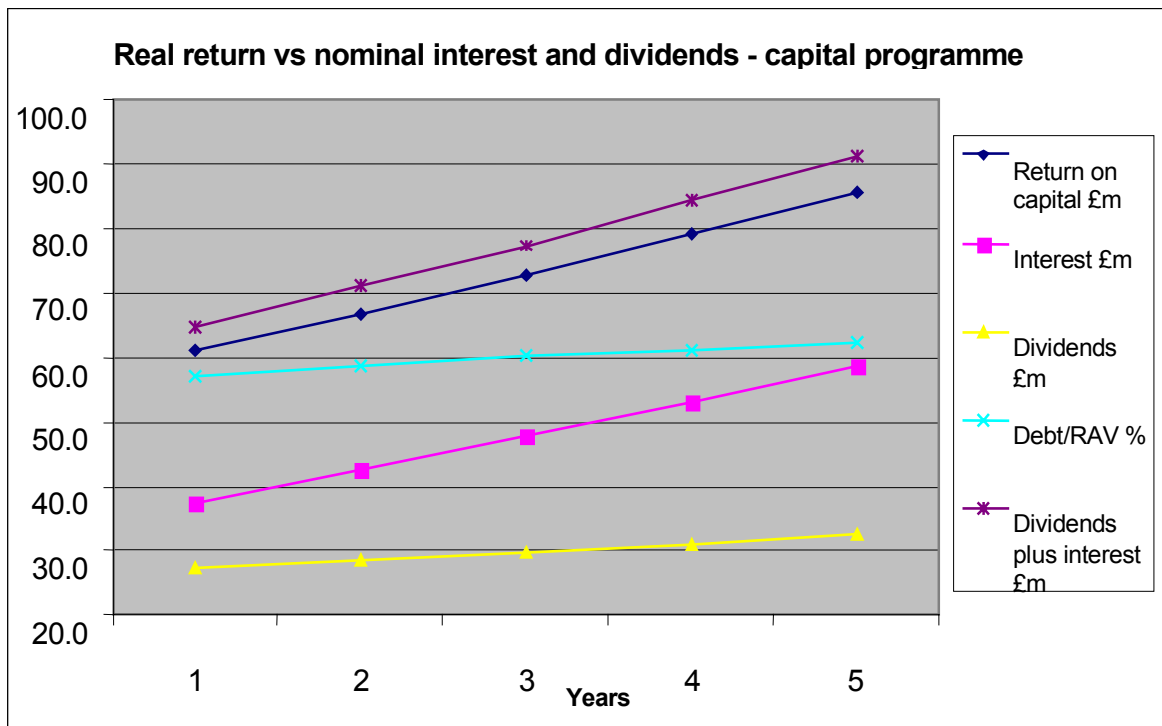
Table A Financial projections and ratios for a company in "steady state"

| <i>out-turn prices £m</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Opening RAV | | 1000.0 | 1025.0 | 1050.6 | 1076.9 | 1103.8 |
| Gross new capex | | 53.2 | 54.5 | 55.8 | 57.2 | 58.7 |
| - Current cost depreciation | | 40.5 | 41.5 | 42.6 | 43.6 | 44.7 |
| - Infrastructure renewals charge | | 12.7 | 13.0 | 13.3 | 13.6 | 14.0 |
| Net new capex | | 0.0 | 0 | 0 | 0 | 0 |
| Closing RAV | 1000 | 1025.0 | 1050.6 | 1076.9 | 1103.8 | 1131.4 |
| Average RAV | | 1012.5 | 1037.8 | 1063.8 | 1090.4 | 1117.6 |
| Return on Capital | | 59.0 | 60.5 | 62.0 | 63.6 | 65.2 |
| Interest payable | | 37.4 | 37.8 | 38.2 | 38.6 | 39.0 |
| Return on Capital after debt servicing | | 21.6 | 22.7 | 23.8 | 25.0 | 26.2 |
| Dividends | 26.1 | 27.3 | 28.5 | 29.7 | 31.1 | 32.4 |
| Return on Capital after dividends | | -5.6 | -5.8 | -5.9 | -6.1 | -6.3 |
| | | | | | | |
| Debt | 550.0 | 555.6 | 561.4 | 567.3 | 573.4 | 579.6 |
| Equity | 450.0 | 469.4 | 489.2 | 509.6 | 530.5 | 551.8 |
| Debt/RAV % | 55.0 | 54.2 | 53.4 | 52.7 | 51.9 | 51.2 |
| | | | | | | |
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | | 3.0 | 3.0 | 3.1 | 3.1 | 3.2 |
| Adjusted FFO interest cover = return on capital /interest payable | | 1.6 | 1.6 | 1.6 | 1.6 | 1.7 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/ debt | | 13.5% | 13.8% | 14.0% | 14.3% | 14.6% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | | 8.6% | 8.7% | 8.8% | 8.9% | 9.0% |

| | Assumption |
|--|--------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% |
| Real cost of debt | 4.3% |
| Real cost of equity | 7.7% |
| Dividend yield | 5.8% |
| Dividend growth | 1.9% |
| Initial gearing | 55% |
| Annual Inflation | 2.5% |
| Average asset life remaining for depreciation | 25 years |
| Level of infrastructure renewals expenditure | 1.25% of RAV |

132. If a regulated company needs to carry out a substantial programme of asset improvement, then annual capital expenditure may exceed regulatory depreciation. As an illustration figure 2 below is based on projections of capital expenditure that are sufficiently large so that RAVs would grow by around 9 per cent in nominal terms per year. On the basis of the same assumptions described above for financing costs, dividend yields and dividend growth then this would result in significant and persistent negative cash flow and upward pressure on gearing as companies borrow to finance this negative cash flow. This is our **base case** scenario.

Figure 2



133. In this illustration there is a divergence between the nominal growth in the RAV (at around 9 per cent per year) and growth in equity (at around 5 percent per year) arising from the assumption on retained earnings and inflation of the RAV). Consequently, the proportion of debt finance, or gearing, increases each year as debt finance is required to bridge the cash flow gap.
134. This would put pressure on the metrics used by the credit rating agencies to assess a company's financial position and could ultimately lead to a deterioration in credit quality. As long as companies are required to undertake significant capital programmes it would appear that the pressure on gearing and financial ratios is perpetuated. The effect on financial ratios is illustrated in table B.

Table B Financial projections and ratios for a company that undertakes a significant programme of asset improvement – the "Base Case"

| <i>Out-turn prices £m</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------|--------|--------|--------|--------|--------|
| Opening RAV | | 1000.0 | 1096.8 | 1197.7 | 1303.0 | 1412.9 |
| Gross new capex | | 126.8 | 133.8 | 141.0 | 148.6 | 156.4 |
| - Current cost depreciation | | 41.9 | 45.9 | 50.0 | 54.3 | 58.8 |
| - Infrastructure renewals charge | | 13.1 | 14.3 | 15.6 | 17.0 | 18.4 |
| Net new capex | | 71.8 | 73.5 | 75.4 | 77.3 | 79.2 |
| Closing RAV | 1000 | 1096.8 | 1197.7 | 1303.0 | 1412.9 | 1527.4 |
| Average RAV | | 1048.4 | 1147.2 | 1250.4 | 1358.0 | 1470.1 |
| Return on Capital | | 61.1 | 66.9 | 72.9 | 79.2 | 85.7 |
| Interest payable | | 37.4 | 42.5 | 47.8 | 53.2 | 58.8 |
| Return on Capital after debt servicing | | 23.7 | 24.4 | 25.1 | 25.9 | 26.9 |
| Dividends | 26.1 | 27.3 | 28.5 | 29.7 | 31.1 | 32.4 |
| Return on Capital after dividends | | -3.5 | -4.1 | -4.6 | -5.1 | -5.6 |
| | | | | | | |
| Debt | 550.0 | 625.3 | 702.9 | 783.0 | 865.4 | 950.1 |
| Equity | 450.0 | 471.5 | 494.8 | 520.1 | 547.5 | 577.3 |
| Debt/RAV % | 55.0 | 57.0 | 58.7 | 60.1 | 61.2 | 62.2 |

| | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------|-------|-------|-------|-------|
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | 3.1 | 3.0 | 2.9 | 2.8 | 2.8 |
| Adjusted FFO interest cover = return on capital/interest payable | 1.6 | 1.6 | 1.5 | 1.5 | 1.5 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/ debt | 12.6% | 12.0% | 11.6% | 11.2% | 11.0% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | 8.2% | 8.0% | 7.8% | 7.6% | 7.5% |

| | Assumption |
|--|--------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% |
| Real cost of debt | 4.3% |
| Real cost of equity | 7.7% |
| Dividend yield | 5.8% |
| Dividend growth | 1.9% |
| Initial gearing | 55% |
| Annual Inflation | 2.5% |
| Average asset life remaining for depreciation | 25 years |
| Level of infrastructure renewals expenditure | 1.25% of RAV |

How have regulators addressed the financeability issue in the past?

135. At previous price control reviews, both Ofwat and Ofgem have emphasised the importance of strong credit quality for the companies they regulate in the context of the significant capital investment programmes they are required to deliver. Both regulators have taken steps to ensure that price limits are set to allow the companies to sustain credit well within investment grade ratings. The financial indicators used to assess companies' financeability are consistent with such ratings and should allow companies to finance the expenditure while at least retaining a solid/comfortable investment grade credit rating. In a number of cases Ofwat allowed extra revenue to ensure that the level and trend of these indicators would be consistent with these objectives (**the financeability or revenue uplift**). Ofwat assumed a generic level of gearing and used the same package of indicators for all companies, regardless of their actual capital structures and associated debt covenants.

136. Ofgem made a similar adjustment for one electricity distribution business in the 2004 EDPCR, but the materiality of the adjustment was small. Financing constraints have been less acute in electricity distribution because Ofgem has adopted an approach to setting these price controls that involves **accelerated depreciation** which also increases cash flow and improves financial ratios.
137. As noted earlier, Ofwat did not assume full distribution of the equity component of the cost of capital as an element was retained to mitigate the financeability issue and it has been clear in its statements to the City that amounts allowed for financeability are not a matter of simply providing higher returns for the companies to disburse in dividends. However, Ofwat's dividend yield assumption of 5.8 per cent was still relatively high compared to the FTSE average. Ofgem assumed dividend yields of 5.0 per cent.
138. As explained in Section 4, in the context of continuing high levels of capital investment the combination of revenue uplift and assumptions on dividend growth and yields were judged to be appropriate in order to continue to attract capital (including equity) to the water sector and to allow companies to maintain adequate credit quality based on projected ratios over the price limit period.
139. This approach, and in particular whether it is sustainable, has been the subject of considerable debate since price limits were finalised in 2004.
140. For example Helm²⁸ has argued that the impact of financeability revenues on returns is one factor that has led to a re-rating of the utilities and the current apparent willingness of acquirers to pay premiums to companies' regulatory asset values. Somewhat contradictorily he also argues that regulators have injected uncertainty because the companies do not know what the regulators' approaches will be in the future. Others have expressed concern that regulators have relied too heavily on the metrics used by credit rating agencies to assess financeability.
141. Ofwat and Ofgem continue to think that their approaches were appropriate given the circumstances leading to the final determinations in 2004. Nevertheless, it is appropriate to consider how best to address these matters in the future. These issues are dealt with in the following section.

This is not an area we have identified as a discussion question but respondents may comment if they wish.

²⁸ Dieter Helm (July 2005), Unfinished business – regulatory reform, Monthly commentary. Available at www.dieterhelm.co.uk.

Section 7: Options for dealing with issues of financeability

142. This section considers both whether there are steps that companies could take to ease financeability constraints (that should be mirrored in the assumptions made by regulators in setting price controls) and whether regulators should modify their overall approach to setting price controls.
143. In setting price controls regulators could take account of the following options that may be available to companies:
- issuing a proportion of debt as index-linked securities (or similar transactions); and
 - funding a higher proportion of investment by equity, either through an equity injection or through retained earnings (dividend cuts).

These options rely on market mechanisms to deal with issues of financeability. Scenarios (described below in Section 7a) have been developed building on the 'base case' scenario from Section 6 to explore in more detail what might be the impact of these financing options on the stylised company's financial projections.

144. Regulators could also deal with issues of financeability in setting price controls by:
- taking a more flexible approach to financial indicators;
 - a revenue uplift;
 - accelerating depreciation; and
 - using a nominal cost of capital to reduce pressure on cash flow.

Each of these approaches is discussed below in Section 7b. Illustrative modelling has been carried out for the revenue uplift and accelerated depreciation options.

145. Each of the options discussed in sections 7a and 7b would have differing impacts on consumers' bills and investors' returns. All need to be considered in relation to the objectives of not unnecessarily increasing perceptions of regulatory risk and ensuring that risks are allocated to parties best able to manage the risk in a cost effective manner.

Section 7a: Market mechanisms

Issuing index-linked debt

146. The issuing of index-linked debt by a regulated company (given the current regulatory approach to setting price controls) would provide a better match between cash inflow received from consumers and cash outflow to investors. This is because index-linked debt has an interest cost that reflects a real rather than a nominal coupon. The same effect can be produced through adopting financial swaps that convert the company's liability to pay from nominal interest to real interest (with the inflation added to the principal sum borrowed) or by manufacturing synthetic index-linked debt instruments with the help of financial intermediaries.
147. The analysis set out in Table C uses the same underlying assumptions as the 'base case' (see figure 2 and table B in Section 6) but includes a proportion of index-linked debt. Index-linked debt has little impact on debt based ratios as net debt is essentially unchanged compared to the base case (see table B). However because the index-linked debt attracts interest payments based on real rather than nominal interest rates, cash interest covers improve materially. In this illustration 25 per cent of its opening debt finance (about 13 per cent of its opening RAV) is assumed to be index-linked (or arrangements to achieve a similar effect have been entered into). An immediate and significant improvement is seen in the cash based interest cover ratios in year 1. Subsequently, the cash based interest cover ratios decline as the proportion of the total debt that is index-linked declines (the scenario assumes that new debt is raised on a nominal basis). However a trend of financial ratios is achieved that should prevent the deterioration in credit quality implied in the base case. If the company faces capital expenditure requirements beyond the period illustrated in table C then it would need to be able to access additional index-linked debt sufficient to maintain the proportion of its capital base financed in this way and retain any beneficial impact on cash based ratios.

Table C Financial projections and ratios for the "Base Case" assuming a proportion of index-linked debt

| <i>out-turn prices £m</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|----------------------------------|------|--------|--------|--------|--------|--------|
| Opening RAV | | 1096.8 | 1197.7 | 1303.0 | 1412.9 | 1527.4 |
| Gross new capex | | 126.8 | 133.8 | 141.0 | 148.6 | 156.4 |
| - Current cost depreciation | | 41.9 | 45.9 | 50.0 | 54.3 | 58.8 |
| - Infrastructure renewals charge | | 13.1 | 14.3 | 15.6 | 17.0 | 18.4 |
| Net new capex | | 71.8 | 73.5 | 75.4 | 77.3 | 79.2 |
| Closing RAV | 1000 | 1096.8 | 1197.7 | 1303.0 | 1412.9 | 1527.4 |
| Average RAV | | 1048.4 | 1147.2 | 1250.4 | 1358.0 | 1470.1 |
| Return on Capital | | 61.1 | 66.9 | 72.9 | 79.2 | 85.7 |
| Interest payable | | 34.0 | 39.0 | 44.2 | 49.5 | 55.1 |

| out-turn prices £m | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Index-linked charge | | 3.4 | 3.5 | 3.6 | 3.7 | 3.8 |
| Return on Capital after debt servicing | | 23.7 | 24.4 | 25.1 | 25.9 | 26.9 |
| Dividends | 26.1 | 27.3 | 28.5 | 29.7 | 31.1 | 32.4 |
| Return on Capital after dividends | | -3.5 | -4.1 | -4.6 | -5.1 | -5.6 |

| | | | | | | |
|-------------------|-------|-------|-------|-------|-------|-------|
| Debt Nominal | 412.5 | 484.4 | 558.5 | 634.9 | 713.6 | 794.6 |
| Debt index-linked | 137.5 | 140.9 | 144.5 | 148.1 | 151.8 | 155.6 |
| Equity | 450.0 | 471.5 | 494.8 | 520.1 | 547.5 | 577.3 |
| Debt/RAV | 55.0% | 57.0% | 58.7% | 60.1% | 61.2% | 62.2% |

| | | | | | |
|--|-------|-------|-------|-------|-------|
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | 3.4 | 3.3 | 3.1 | 3.0 | 3.0 |
| Adjusted FFO interest cover = return on capital/interest payable | 1.8 | 1.7 | 1.6 | 1.6 | 1.6 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/ debt | 13.1% | 12.5% | 12.1% | 11.7% | 11.3% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | 8.8% | 8.5% | 8.3% | 8.1% | 7.9% |

| | Assumption |
|--|-------------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% |
| Real cost of debt | 4.3% |
| Real cost of equity | 7.7% |
| Dividend yield | 5.8% |
| Dividend growth | 1.9% |
| Initial gearing | 55% |
| Annual Inflation | 2.5% |
| Average asset life remaining for depreciation | 25 years |
| Level of infrastructure renewals expenditure | 1.25% of RAV |

148. In the past there may have been limited appetite for direct issuance of corporate index-linked debt due to a limited number of investors and constraints on their portfolios. Index-linked debt may be more expensive because investors factor in uncertainty arising from the fact that they have to wait longer to realise their overall return. However, recent evidence suggests convergence in the pricing spread between nominal and index-linked corporate debt. In recent years the demand for long-term government index-linked securities has grown substantially reflecting in part a shift in the portfolios of pension funds in favour of index-linked debt. Currently demand is so great relative to supply that yields are at an all time low. Whether this pattern of demand is also evident in the corporate index-linked market is something regulators will need to understand going forward.
149. In seeking to achieve the same effect, some companies have issued nominal coupon debt accompanied by an inflation swap. But this may be increasingly unattractive in particular to the listed companies because it does not qualify for treatment as hedge accounting under International Accounting Standards (specifically IAS39) and therefore can introduce earnings volatility.
150. In addition there have been developments in the financial markets involving intermediaries that appear to match the pension funds' demand for very low risk inflation linked revenue streams with the potential suppliers of such instruments. This could increase the capacity of the index-linked market. The intermediaries repackage the debt and enhance credit quality so as to make the repackaged debt attractive to a wider range of investors. Monoline insurers take the issuer's credit risk, leaving investors and swap counter parties only exposed to the very high credit ratings of the monoline. The total market may be limited by monoline capacity. In addition the monolines are restricted by insurance regulations in the US as to how much they can invest in particular asset classes. It would appear that they have a much greater capacity to be involved in insuring (or wrapping) debt that has been issued out of the so called securitised structures (e.g. in water Anglian, Glas, Southern and Artesian) because of the additional creditor protections within these structures. Nevertheless, there are examples of the monolines insuring non securitised debt (for example Scotia Gas Distribution) but the market may be much more constrained.

Key issue for consideration (4). Should regulators assume that a proportion of debt is index-linked when setting price controls? Is access to the index-linked debt markets (or related instruments) available to all companies regardless of their specific financial/corporate structure? Are there longer term implications for the companies' financial stability of adopting a significant proportion of index-linked debt? What is the demand for corporate index-linked debt and are there constraints on investors portfolios? Would it be more expensive?

Equity injection and retained earnings

i) Equity Injection

151. Another approach to relieving the pressure on gearing would be to assume that the industry is able to raise new equity (e.g. through a rights issue, issuing additional share capital as required or an injection of cash from a parent company). This could reduce gearing, increase interest coverage and will relieve financeability constraints.
152. Table D illustrates this for our stylised water company. In this example in year 2 there is an equity injection of £60million equating to around 10 per cent of existing equity. This £60m is used to reduce the level of debt and so reduce interest payments but obviously payments of dividends increase. Consequently the cash based financial ratios improve. To the extent that the capital programme extends beyond the five year period shown in the table the company would need to consider whether further equity injections were desirable.

Table D Financial projections and ratios for the "Base Case" assuming a £60m equity injection in year 2

| <i>out-turn prices £m</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|------|--------|--------|--------|--------|--------|
| Opening RAV | | 1000.0 | 1096.8 | 1197.7 | 1303.0 | 1412.9 |
| Gross new capex | | 126.8 | 133.8 | 141.0 | 148.6 | 156.4 |
| - Current cost depreciation | | 41.9 | 45.9 | 50.0 | 54.3 | 58.8 |
| - Infrastructure renewals charge | | 13.1 | 14.3 | 15.6 | 17.0 | 18.4 |
| Net new capex | | 71.8 | 73.5 | 75.4 | 77.3 | 79.2 |
| Closing RAV | 1000 | 1096.8 | 1197.7 | 1303.0 | 1412.9 | 1527.4 |
| Average RAV | | 1048.4 | 1147.2 | 1250.4 | 1358.0 | 1470.1 |
| Return on Capital | | 61.1 | 66.9 | 72.9 | 79.2 | 85.7 |
| Interest payable | | 37.4 | 42.5 | 43.7 | 49.3 | 55.0 |
| Return on Capital after debt servicing | | 23.7 | 24.4 | 29.2 | 29.9 | 30.7 |
| Dividend on existing equity | 26.1 | 27.3 | 28.5 | 29.7 | 31.1 | 32.4 |
| Dividend on new equity | | | | 5.8 | 6.1 | 6.3 |
| Return on Capital after dividends | | -3.5 | -4.1 | -6.4 | -7.2 | -8.1 |

| | | | | | | |
|---|-------|-------|-------|-------|-------|-------|
| Debt | 550.0 | 625.3 | 642.9 | 724.7 | 809.2 | 896.5 |
| Equity (including £60m of new equity in year 2) | 450.0 | 471.5 | 554.8 | 578.3 | 603.7 | 630.9 |
| Debt/RAV | 55.0% | 57.0% | 53.7% | 55.6% | 57.3% | 58.7% |

| | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------|-------|-------|-------|-------|
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | 3.1 | 3.0 | 3.2 | 3.1 | 3.0 |
| Adj FFO int cover = return on capital /interest payable | 1.6 | 1.6 | 1.7 | 1.6 | 1.6 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/ debt | 12.6% | 13.2% | 13.1% | 12.5% | 12.0% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | 8.2% | 8.7% | 9.0% | 8.7% | 8.4% |

| | Assumption |
|--|--------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% |
| Real cost of debt | 4.3% |
| Real cost of equity | 7.7% |
| Dividend yield | 5.8% |
| Dividend growth | 1.9% |
| Initial gearing | 55% |
| Annual Inflation | 2.5% |
| Average asset life remaining for depreciation | 25 years |
| Level infrastructure renewals expenditure | 1.25% of RAV |

153. Since privatisation, only United Utilities has raised fresh equity through a rights issue for a regulated business. It raised £1bn in two tranches in 2003 and 2005. Other transactions in the sector have involved equity issuance but have resulted in an overall more highly geared capital structure. For example the purchase by Aquavit Ltd of Northumbrian Water in 2003 involved a listing of its parent originally on AIM followed by a full listing on the London Stock Exchange. All private equity deals involving regulated businesses have had an equity component.
154. A company's ability to maintain the required equity formation to stabilise gearing will be limited by the appetite for new equity. Regulators would have to consider, therefore, whether the existing assumption on the cost of equity is sufficient to sustain wide-scale injection of new equity into regulated businesses. It is possible that other changes to the regulatory framework might be required to promote investor confidence.
155. A consequence of this approach would be that the regulator might have to allow for the tax implications of an increased proportion of equity in companies' balance sheets.

156. There might also be implications for a number of regulated businesses that carry much higher levels of debt finance. Companies with such financing structures may have more limited access to new equity. However regulators have been clear that capital structures and the associated risks and costs are a matter for the companies and their shareholders, not consumers.

ii) Retained earnings (including lower dividend yields but higher dividend growth)

157. If a company is not fully distributing its allowed equity return through dividends, then the absolute level of shareholders' equity in the regulatory asset value would be higher as companies would have to borrow less to finance the growing capital base. This would reduce the need for debt finance and ameliorate any financeability constraints. Both Ofwat and Ofgem in their modelling at the most recent price reviews assumed dividend yields less than the allowed cost of equity.
158. Table E shows for the stylised company the maximum level of dividends that can be paid if sufficient equity is to be retained in the business to stabilise gearing. This shows that dividend payments would have to fall (or share prices rise) to a yield of around 3 per cent to stabilise gearing. Clearly there would be growth of 4.7 per cent in dividends to achieve the total cost of equity of 7.7 per cent. This is significantly below the yields observed in water prior to the 2004 review of price limits (albeit yields have fallen more recently, largely due to the market valuation premium to the RAV). For equity premium investors to accept a significantly lower dividend yield, they would have to change their perception of utility shares. They would have to be content to realise the majority of their return by either holding the equity over a long period of time or by selling their shares rather than in the form of income. The company may be in a position to re-evaluate its dividend payments if the capital programme is smaller in future years.

Table E Financial projections and ratios for the "Base Case" assuming dividend constrained for the required equity formation

| <i>out-turn prices</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------|--------|--------|--------|--------|--------|
| Opening RAV | | 1000.0 | 1096.8 | 1197.7 | 1303.0 | 1412.9 |
| Gross new capex | | 126.8 | 133.8 | 141.0 | 148.6 | 156.4 |
| - Current cost depreciation | | 41.9 | 45.9 | 50.0 | 54.3 | 58.8 |
| - Infrastructure renewals charge | | 13.1 | 14.3 | 15.6 | 17.0 | 18.4 |
| Net new capex | | 71.8 | 73.5 | 75.4 | 77.3 | 79.2 |
| Closing RAV | 1000 | 1096.8 | 1197.7 | 1303.0 | 1412.9 | 1527.4 |
| Average RAV | | 1048.4 | 1147.2 | 1250.4 | 1358.0 | 1470.1 |
| Return on Capital | | 61.1 | 66.9 | 72.9 | 79.2 | 85.7 |
| Interest payable | | 37.4 | 41.7 | 46.0 | 50.4 | 54.9 |
| Return on Capital after debt servicing | | 23.7 | 25.2 | 26.9 | 28.7 | 30.8 |
| Dividends | | 14.5 | 15.5 | 16.7 | 17.9 | 19.2 |
| Return on Capital after dividends | | 9.2 | 9.7 | 10.2 | 10.8 | 11.6 |
| Debt | 550.0 | 612.5 | 676.4 | 741.5 | 808.0 | 875.6 |
| Equity | 450.0 | 484.2 | 521.3 | 561.5 | 604.9 | 651.8 |
| Debt/RAV | 55.0% | 55.8% | 56.5% | 56.9% | 57.2% | 57.3% |

| | | | | | |
|--|-------|-------|-------|-------|-------|
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | 3.1 | 3.1 | 3.0 | 3.0 | 3.0 |
| Adj FFO int cover = return on capital/interest payable | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/ debt | 12.9% | 12.6% | 12.5% | 12.4% | 12.3% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | 10.5% | 10.3% | 10.2% | 10.2% | 10.1% |

| | Assumption | Calculated |
|--|-------------------|-------------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% | |
| Real cost of debt | 4.3% | |
| Real cost of equity | 7.7% | |
| Dividend yield | | 3.0% |
| Dividend growth | | 4.7% |
| Initial gearing | 55% | |
| Annual Inflation | 2.5% | |
| Average asset life remaining for depreciation | 25 years | |
| Level infrastructure renewals expenditure | 1.25% of RAV | |

Regulatory commitment and investor confidence

159. Regulators could consider measures to increase regulatory commitment and investor confidence to make this change or the possibility of wide-scale rights issues more palatable to investors. These include ideas put forward by Helm and Mayer and others that are discussed in Section 5.
160. It is possible that reducing uncertainty about future cash flow in itself might result in credit rating agencies and investors being more relaxed about pressure on ratios in the short-term. If that were the case then the pressure to constrain dividends may be reduced because credit ratings could be maintained at lower ratio thresholds. Reducing uncertainty could also be beneficial to rights issues and facilitate adoption of more flexible dividend policies.
161. There is already some evidence that the risk around review outcomes may have reduced as a result of the more transparent approach adopted by regulators. There was evidence at Ofwat's 2004 review that investors were prepared to undertake quite significant transactions shortly before the final determinations of prices. Similarly there is evidence that the gas distribution businesses were sold at substantial premia to RAVs with only a limited period to go before the next price control review. On this basis it may be that assumptions used by regulators relating to dividend yields and equity injections could be more flexible without significant changes to the regulatory regime.

162. Indeed some equity analysts are already building in an assumption in their valuation models that the revenue uplift for financeability may not be used beyond 2010. For example a report produced by UBS in August 2005 states²⁹

“Ofwat has made it clear that companies need to manage dividend policy to ensure a continuing high level of capex can be funded. In our view we see no reason why companies cannot access the equity markets or retain dividends during periods of high capex. Provided the base allowed return is high enough”

Key Issue for discussion (5). Are there any changes that would be required to the regulatory regime in order to facilitate equity injections? What would be the implications for the highly geared companies?

Key Issue for discussion (6). Would it be reasonable for regulators to be more flexible in their approach to modelling dividends as a method for stabilising gearing and easing any financing constraints? Would such an approach require changes to the regulatory regime in order to increase certainty and if so what sort of changes would be most appropriate?

Section 7b: Options requiring regulators to modify their approach to setting price controls

Taking a more flexible approach to the interpretation of key financial ratios

163. If regulated utility companies want cost effective access to debt from the bond markets they need an investment grade issuer credit rating. Ofwat and Ofgem developed a package of financial indicators to use at price reviews to assess financeability. These were based on the indicators commonly used by market analysts, including the credit rating agencies and have been calibrated so that financial projections of the company are consistent with a solid/comfortable investment grade credit rating.
164. Regulators have stressed that it is the overall trend of the package of indicators, rather than the level of any particular indicator, that is most important. Furthermore there is no single ratio that captures the approach of all the market analysts. Most analysts use a number of ratios, and different analysts put different emphasis on different ratios. The credit rating agencies emphasise that their ratings are based on a broader assessment of the business, and not just on quantitative analysis.
165. Regulated utilities have specific characteristics that particularly distinguish them from other industries. The businesses are very long-term in nature, are to a large degree monopolistic and have supportive regulatory frameworks. It is not

²⁹ UBS Investment Research – Focus on UK Water Utilities – 8 August 2005.

easy to assess the weight in quantitative terms to put on these characteristics in comparison with other industrial companies in competitive markets. If these characteristics are not fully reflected in the levels of financial indicators expected for a particular level of credit quality, then one option for regulators is to explore with market analysts, credit rating agencies and other stakeholders how best to take account of these factors.

166. Regulators have used packages of ratios³⁰ that emerge from the different approaches taken by the different credit rating agencies. For example in considering water and sewerage companies MIS states³¹ that in consideration of the economic fundamentals of the water companies and the regulatory framework, EBITDA- or FFO-based debt service cover ratios are not particularly effective indicators of a company's financial risk. However it is precisely the FFO-based debt service and interest cover ratios that S&P focuses on.
167. For the water companies, MIS puts emphasis on the adjusted interest coverage ratio over FFO or EBITDA based ratios. This is based on a view that all capital expenditure undertaken by the water and sewerage companies is non-discretionary. In its view the most appropriate single measure of default risk is the ability of a company to service debt payments assuming that all the capital investment funded by accounting charges (i.e. depreciation and infrastructure renewals) is reinvested in maintaining the value of the RAV and on which the ability to refinance existing debt depends. S&P has concluded it is not practicable to calculate a meaningful adjusted interest cover ratio for electricity distribution companies because regulatory depreciation is accelerated and statutory depreciation is unrelated to the capital base. FitchRatings has developed an adjusted interest cover ratio for water which adjusts for cash maintenance expenditure rather than the accounting charges approach adopted by MIS. All the rating agencies focus on the level of debt to RAV as a key ratio.
168. The dynamics of a company's capital base and regulatory depreciation profile which is underpinned by different asset life assumptions can result in a divergence in the relative levels of individual financial indicators. For instance a situation could arise where the level of FFO to debt was indicative of one rating level but the level of adjusted interest cover was indicative of another rating.
169. It is possible that the credit rating agencies may be persuaded to adjust their approach to credit risk assessment (both the definition of key ratios and their threshold values for a given rating) to take account of new information or increased transparency and certainty in the regulatory process.

³⁰ Ofwat (2004) Future water and sewerage charges 2005-10 – Final determinations

³¹ MIS, The UK Water Sector: Financial Parameters and Structural Enhancements for Leveraged Financing – July 2002

170. Particular questions that would be worth exploring more widely are:
- In calculating adjusted FFO interest coverage is it appropriate to subtract an estimate of the long-term average level of capital expenditure rather than regulatory depreciation? (Where depreciation is accelerated this would tend to provide a higher level of coverage.)
 - In setting target (threshold) levels of FFO interest coverage should account be taken of asset lives? Is it appropriate to accept lower levels of FFO interest coverage where asset lives are relatively long?
171. As well as considering how best to calculate key ratios a more flexible approach could also be adopted by regulators to the interpretation of key ratios, including:
- revisiting projections of revenue only if financial ratios dropped below the thresholds associated with minimum investment grade rather than a threshold well within investment grade;
 - putting more emphasis on long-term trends in financial ratios and less on particular target levels.
172. In adopting any of these approaches a regulator would need to be satisfied that reasonably efficient companies are in a position to 'finance their functions'. For instance, consideration could be given to soften the approach to targeting solid/comfortable investment grade credit rating and instead focus on lower investment grade credit ratings. This would require regulators to look again at the capacity of the debt markets for lower investment grade credit rated companies and to assess whether this is a sustainable option for the industries that they regulate. At present relatively few regulated businesses have credit ratings as low as flat BBB/Baa2. Ofwat's stated position when it consulted on the Northumbrian acquisition in 2003 is that it has concerns over whether credit quality of BBB is a sustainable position for the industry as a whole.
173. Nevertheless, given that the regulatory framework has been in place for in excess of 15 years and is now relatively stable and well understood it might be that a more flexible approach focusing on the longer term could be adopted without unduly jeopardising the credit ratings of reasonably efficient businesses.

Key Issue for discussion (7). Should regulators adopt pragmatic definitions of ratios used by the credit rating agencies? Is the specific level of any particular ratios critical to credit worthiness? Is it the overall level and trend of ratios that is important? Would there be significant difficulties for companies if the majority of ratings were BBB?

Revenue uplift

174. This has been the approach adopted by Ofwat in 1999 and 2004 for the water industry and involves increasing price control revenue such that key financial ratios are no longer a constraint.
175. Table F below shows for the stylised water company the additional revenue that is required to remedy the deterioration in financial ratios.

Table F Financial projections and ratios for the "Base Case" with revenue uplift

| <i>out-turn prices £m</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|----------------------------------|------|--------|--------|--------|--------|--------|
| Opening RAV | | 1000.0 | 1096.8 | 1197.7 | 1303.0 | 1412.9 |
| Gross new capex | | 126.8 | 133.8 | 141.0 | 148.6 | 156.4 |
| - Current cost depreciation | | 41.9 | 45.9 | 50.0 | 54.3 | 58.8 |
| - Infrastructure renewals charge | | 13.1 | 14.3 | 15.6 | 17.0 | 18.4 |
| Net new capex | | 71.8 | 73.5 | 75.4 | 77.3 | 79.2 |
| Closing RAV | 1000 | 1096.8 | 1197.7 | 1303.0 | 1412.9 | 1527.4 |
| Average RAV | | 1048.4 | 1147.2 | 1250.4 | 1358.0 | 1470.1 |
| Return on Capital | | 61.1 | 66.9 | 72.9 | 79.2 | 85.7 |
| Revenue uplift | | 0.0 | 0.0 | 3.0 | 6.0 | 9.0 |
| Total Return on Capital | | 61.1 | 66.9 | 75.9 | 85.2 | 94.7 |
| Interest costs | | 37.4 | 42.5 | 47.8 | 53.0 | 58.2 |

| | | | | | | |
|--|------|------|------|------|------|------|
| Return on Capital after debt servicing | | 23.7 | 24.4 | 28.1 | 32.1 | 36.5 |
| Dividends | 26.1 | 27.3 | 28.5 | 29.7 | 31.1 | 32.4 |
| Return on Capital after dividends | | -3.5 | -4.1 | -1.6 | 1.1 | 4.0 |

| | | | | | | |
|----------|-------|-------|-------|-------|-------|-------|
| Debt | 550.0 | 625.3 | 702.9 | 780.0 | 856.2 | 931.3 |
| Equity | 450.0 | 471.5 | 494.8 | 523.1 | 556.7 | 596.1 |
| debt/RAV | 55.0% | 57.0% | 58.7% | 59.9% | 60.6% | 61.0% |

| | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------|-------|-------|-------|-------|
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | 3.1 | 3.0 | 3.0 | 3.0 | 3.0 |
| Adj FFO int cover = return on capital/interest payable | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/ debt | 12.6% | 12.0% | 12.0% | 12.1% | 12.2% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | 8.2% | 8.0% | 8.2% | 8.5% | 8.7% |

| | Assumption |
|--|--------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% |
| Real cost of debt | 4.3% |
| Real cost of equity | 7.7% |
| Dividend yield | 5.8% |
| Dividend growth | 1.9% |
| Initial gearing | 55% |
| Annual Inflation | 2.5% |
| Average asset life remaining for depreciation | 25 years |
| Level infrastructure renewals expenditure | 1.25% of RAV |

176. In the above illustration overall returns increase from the 5.8 per cent (the assumed WACC) to 6.4 per cent by year 5. A criticism of the revenue uplift approach is that it raises questions of intergenerational equity and it has not been implemented in a way that is value neutral. Companies have not been required to commit to paying back the additional revenues (i.e. the revenues above the cost of capital that have been allowed for in consumers' bills) when the cash flow position of the companies improves. A difficulty with trying to require companies to pay back is that unless it is clear that these payments will be affordable in the future and not create new issues of financeability then this may increase uncertainty and perceptions of risk.
177. Value neutrality could be achieved, for example, by capitalising the revenue uplift and if at a future price control review the financial constraints had eased subtracting some or all of these capitalised amounts from companies' RAVs. If this or other mechanisms were to be adopted it would be important for regulators to explain these to the markets, when they would come into effect and to consider how they could be introduced without having an unduly adverse

impact on perceptions of regulatory risk and the future financeability of the companies.

178. The future size of capital programmes is and the associated size of any financeability constraints will be important in assessing the practicality of such an approach.

Accelerated depreciation

179. One way of increasing cash flow is to accelerate depreciation payments by shortening the period over which an asset is depreciated. An asset that has a 40 year life that is depreciated on a straight-line basis has an annual depreciation charge of 2½ per cent of its gross asset value. If this asset is depreciated over 20 years then the annual depreciation charge increases to 5 per cent of its gross asset value. This approach is present value neutral – in that consumers pay more in the short-term but in the longer term prices are lower as the average level of the RAV is lower. However it can divorce the depreciation used in setting price limits from the economic life of the assets being funded. It also raises questions over intergenerational equity.
180. Table G shows the effect of accelerating depreciation in order to bring forward cash flow to early years and remedy the deterioration in financial indicators. In this illustration the average asset life remaining has to be reduced from 25 years to 20 years.

Table G Financial projections and ratios for the "Base Case" with accelerated depreciation

| <i>out-turn prices £m</i> | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|------|--------|--------|--------|--------|--------|
| Opening RAV | | 1000.0 | 1090.5 | 1184.8 | 1283.2 | 1385.8 |
| Gross new capex | | 126.8 | 133.8 | 141.0 | 148.6 | 156.4 |
| - Current cost depreciation | | 48.2 | 52.8 | 57.5 | 62.5 | 67.6 |
| - Infrastructure renewals charge | | 13.1 | 14.3 | 15.6 | 17.0 | 18.4 |
| Net new capex | | 65.5 | 67.1 | 68.8 | 70.5 | 72.3 |
| Net new capex | | 65.5 | 67.1 | 68.8 | 70.5 | 72.3 |
| Closing RAV | 1000 | 1090.5 | 1184.8 | 1283.2 | 1385.8 | 1492.7 |
| Average RAV | | 1045.2 | 1137.6 | 1234.0 | 1334.5 | 1439.2 |
| Return on Capital | | 60.9 | 66.3 | 71.9 | 77.8 | 83.9 |
| Interest costs | | 37.4 | 42.1 | 47.0 | 52.0 | 57.1 |
| Return on Capital available for dividend | | 23.5 | 24.2 | 25.0 | 25.8 | 26.8 |
| Dividends | | 27.3 | 28.5 | 29.7 | 31.1 | 32.4 |
| Return on Capital after dividends | | -3.7 | -4.3 | -4.8 | -5.2 | -5.6 |

| out-turn prices £m | Yr 0 | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Debt | 550.0 | 619.2 | 690.5 | 764.1 | 839.8 | 917.7 |
| Equity | 450.0 | 471.3 | 494.3 | 519.2 | 546.0 | 575.0 |
| debt/RAV | 55.0% | 56.8% | 58.3% | 59.5% | 60.6% | 61.5% |
| FFO interest cover = (return on capital + CCD and IRC)/interest payable | | 3.3 | 3.2 | 3.1 | 3.0 | 3.0 |
| Adj FFO int cover = return on capital/interest payable | | 1.6 | 1.6 | 1.5 | 1.5 | 1.5 |
| FFO/Debt = (return on capital + CCD and IRC less interest payable)/debt | | 13.7% | 13.2% | 12.8% | 12.5% | 12.3% |
| RCF/Debt = (return on capital + CCD and IRC less interest payable less dividends)/debt | | 9.3% | 9.1% | 8.9% | 8.8% | 8.7% |

| | Assumption | Calculated |
|--|-------------------|-------------------|
| Real vanilla WACC (pre tax cost of debt and post tax cost of equity) | 5.8% | |
| Real cost of debt | 4.3% | |
| Real cost of equity | 7.7% | |
| Dividend yield | 5.8% | |
| Dividend growth | 1.9% | |
| Initial gearing | 55% | |
| Annual Inflation | 2.5% | |
| Average asset life remaining for depreciation | | 20 years |
| Level infrastructure renewals expenditure | 1.25% of RAV | |

181. In the past regulators have adopted different approaches to depreciation and asset lives. Ofgem has adopted 20 year asset lives in electricity distribution to deal with financing constraints but has used a 40 year life in transmission and gas distribution. The decision to adopt a 20 year asset life in electricity distribution reflected the particular circumstances of these companies and the decisions made at earlier price control reviews to depreciate privatisation assets on a straight line basis over 10 to 15 years. Ofwat has not accelerated depreciation in setting price limits.
182. While accelerated depreciation improves cash flow there remains some questions as to whether it would improve some of the key ratios used by analysts and credit rating agencies, for example the adjusted FFO interest coverage.

183. Annex A explores in more detail the relationship between asset life assumptions underpinning the regulatory depreciation charge and the circumstances where the key financial ratios may be a constraint.

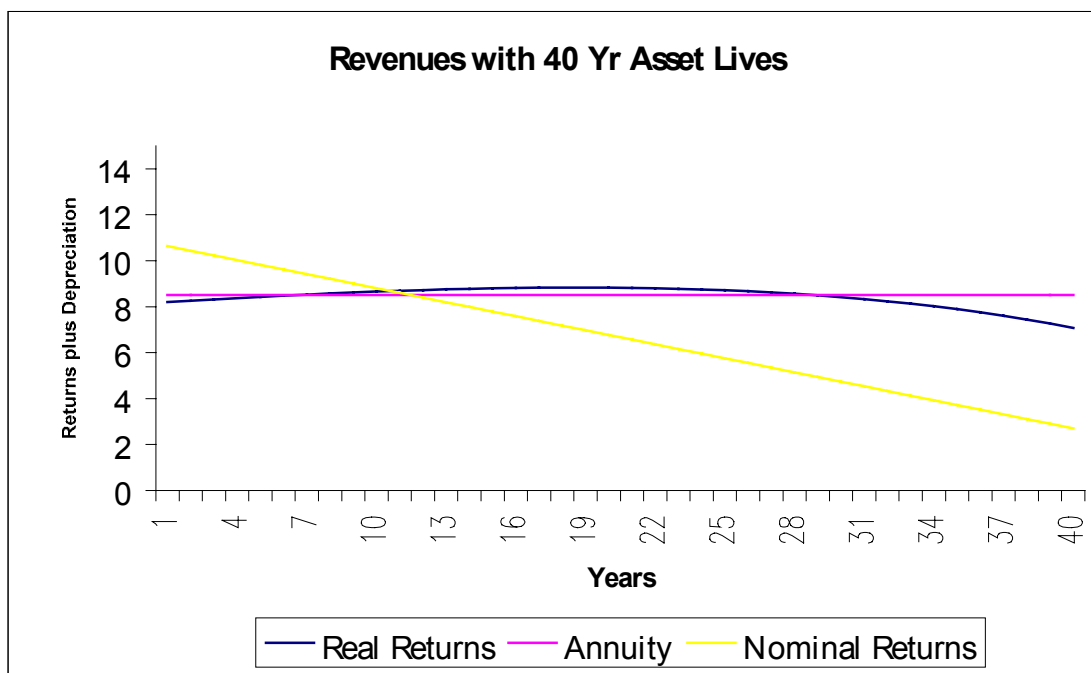
Use a nominal cost of capital in setting price limits

184. There are a number of approaches that could be taken to calculating depreciation and/or returns consistent with the overall cost of capital. While these are equivalent in present value terms to the current approach they have different cash flow profiles over time and so different implications for cash flow financial ratios.

185. An alternative to the current approach would be to apply a nominal cost of capital to an asset base calculated in constant prices. In order for this to be equivalent to the current approach in present value terms for individual assets the depreciation charge would need to remain in constant prices with no further adjustments for inflation. A further approach would be to calculate the allowances for depreciation and returns as an annuity using the nominal cost of capital as the discount rate.

186. These should be considered as examples of the options available and the profile of returns plus depreciation for a forty year asset life are illustrated in the chart below. There are other present value neutral profiles of returns and/or depreciation that could also be considered.

Figure 3



187. While the front loading of returns will tend to address immediate issues associated with financeability there are two disadvantages associated with the front loading of returns by adopting a nominal cost of capital:

- the impact of discounting over a relatively long time means that advancing revenue to the start of the period will tend to have a significant downward effect on both revenues later in the period and on the overall average level of revenue. In simple terms adding £1 to revenue in year 1 (worth 92.5p in PV terms) would require an offsetting reduction in revenue of £4.42 in year 20 or £21.38 in year 40 to leave PVs in the base year unchanged. Given that regulated businesses tend to operate networks that require investment on an ongoing basis then any significant reduction in average revenues available for investors (relative to debt levels) will tend to increase overall pressure on financial ratios in the longer term;
- for assets with long lives annual depreciation charges will be relatively low. This will tend to make measures of FFO interest coverage particularly sensitive to the changes identified above.

These issues are similar to those raised in the discussion of retained earnings (in relation to assuming lower yields in the short-term and higher dividend growth in the longer-term) and in relation to making the revenue uplift present value neutral. These are all approaches to fixing the financeability problem in the short-term but it is not clear whether they provide a robust longer-term solution.

Key Issue for discussion (8). If there are remaining issues of financeability what are the advantages and disadvantages of (a) revenue uplift (and should this be PV neutral (b) accelerated depreciation (c) profiling returns on a nominal basis?

Summary

188. The issue of financeability appears to have the following dimensions:

- what assumptions should regulators make about equity financing when RAVs are increasing;
- how should the cash flow timing differences associated with the regulators use of a real cost of capital be dealt with;
- do the financial ratios used by credit rating agencies over emphasise short term cash flow and if so what approach should regulators adopt to these ratios;
- what steps could reasonably be taken by regulators to minimise the uncertainty around future cash flows from RAVs;
- should regulators be prepared to accelerate depreciation or reprofile cash flows in other ways to deal with issues of financeability.

189. This section has set out options that may be available to the companies to manage the financing constraint and seeks views on whether regulators should make similar assumptions in constructing the financial modelling that is undertaken as part of the price control review process. There have been particular developments in the index-linked debt markets since the last reviews and some equity analysts are suggesting equity injections and/or a more flexible approach to dividend policy may not be unreasonable assumptions.
190. The paper also seeks views on a range of regulatory approaches for dealing with financeability at future price reviews including the current regulatory approaches. In considering the approach to these issues in future it will be important to take account of any costs to consumers as well as the desirability of avoiding a situation where a regulated business might be subject to unnecessary financial constraints.

Section 8: Issues for discussion

191. Views are invited on any aspect of the issues raised in this document and in particular on:

Key issue for discussion (1). Should financial ring fencing arrangements be extended to cover all monopoly businesses and modified so that they all include cash lock-up provisions? How might the introduction of cash lock-up provisions affect existing financial structures including holding company debt? Are the current ring fencing provisions sufficient to allow the activities of the licensed undertaker to be fully separated from other group entities? If not, what additional ring fencing provisions might be appropriate and what might be the costs and benefits of these?

Key issue for discussion (2). Would the separation of past and future capital investment improve the incentives for investment, lower the overall risk of regulated businesses and reduce the cost of finance? Are there any practical implications if such an approach was adopted?

Key issue for discussion (3). Is there any evidence of a lack of regulatory commitment to regulatory asset values or equity funding and if so how might this be best rectified?

Key issue for consideration (4). Should regulators assume that a proportion of debt is index-linked when setting price controls? Is access to the index-linked debt markets (or related instruments) available to all companies regardless of their specific financial/corporate structure? Are there longer term implications for the companies' financial stability of adopting a significant proportion of index-linked debt? What is the demand for corporate index-linked debt and are there constraints on investors portfolios? Would it be more expensive?

Key Issue for discussion (5). Are there any changes that would be required to the regulatory regime in order to facilitate equity injections? What would be the implications for the highly geared companies?

Key Issue for discussion (6). Would it be reasonable for regulators to be more flexible in their approach to modelling dividends as a method for stabilising gearing and easing any financing constraints? Would such an approach require changes to the regulatory regime in order to increase certainty and if so what sort of changes would be most appropriate?

Key Issue for discussion (7). Should regulators adopt pragmatic definitions of ratios used by the credit rating agencies? Is the specific level of any particular ratios critical to credit worthiness? Is it the overall level and trend of ratios that is important? Would there be significant difficulties for companies if the majority of ratings were BBB?

Key Issue for discussion (8). If there are remaining issues of financeability what are the advantages and disadvantages of (a) revenue uplift (and should this be PV neutral (b) accelerated depreciation (c) profiling returns on a nominal basis?

Annex A: The constraints created by financial ratios

Financing constraints on regulated businesses might arise because of high levels of gearing, increasing capital expenditure and/or the approach that regulators adopt in setting price controls. This annex attempts to assess the likely extent of financial constraints for a reasonably efficient business subject to price control regulation. It takes the financial ratios used by regulators (particularly those focussed on by Ofgem in its 2004 Electricity Distribution Price Control Review) and credit rating agencies to assess financial viability and examines the circumstances where these may form binding constraints in the financial modelling underlying a price control review.

The following three assumptions underpin this analysis:

- regulators are able to accurately estimate the cost of capital for a regulated business;
- each regulated business will be able to meet regulatory targets for operating and capital efficiencies; and
- regulators use consistent assumptions in setting the costs of capital and in the financial projections and modelling carried out at price control reviews.

This analysis encompasses four financial ratios – FFO interest coverage, RCF to debt, adjusted FFO interest coverage and debt to RAV.

Ratio 1: (FFO / interest payments on debt) > 3

FFO is cash flow from operating activities minus tax. Assuming that the regulatory allowances for operating costs and infrastructure renewals are consistent with outturn expenditures and that the regulator adopts a building block approach to setting price controls then FFO is equivalent to $(WACC \cdot RAV) + \text{regulatory depreciation}$.

Regulatory depreciation can be approximated as $(1/\text{average asset life remaining}) \cdot RAV$. Average asset life remaining = AALR.

Interest payments on debt are equivalent to $(\text{real cost of debt} \cdot \text{inflation} \cdot \text{gearing}) \cdot RAV$.

In the 2004 EDPCR the WACC was estimated at 5.5% and the real cost of debt at 4.1%. Assuming inflation of 2.5% gives a nominal interest rate of 6.7%.

Bring the above together gives the following.

$$\text{FFO}/(\text{interest payments on debt}) = \frac{(0.055 \cdot RAV) + [(1/\text{AALR}) \cdot RAV]}{0.067 \cdot RAV \cdot \text{Gearing}} \quad (1)$$

$$= \frac{0.055 + (1/\text{AALR})}{0.067 \cdot \text{Gearing}} \quad (2)$$

Reinstating the inequality and assuming the 57.5% gearing used in the EDPCR allows

for the following analysis.

$$\frac{0.055+(1/\text{AALR})}{0.038525} > 3 \quad (3)$$

$$(1/\text{AALR}) > 0.060575 \quad (4)$$

$$\text{AALR} < 16.5 \text{ years} \quad (5)$$

This suggests at relatively low levels of inflation FFO interest coverage will not generally be a constraint provided that regulatory assets are depreciated over less than 32 years (32 years gives a typical AALR of 16 years).

This ratio will tend to deteriorate (a) with higher levels of inflation (b) if the average life remaining of regulatory assets increases (c) with higher levels of gearing. In these industries new assets tend to have relatively long asset lives which increase the AALR of the total asset base.

Many assets used by utility companies will have relatively long service and economic lives. For instance the PE pipes used to distribute water and gas may have economic lives in excess of 40 years. In electricity low voltage distribution cables and transformers may also have lives in excess of 40 years.

In electricity distribution new capital expenditure has been depreciated over 20 years in the calculations underlying the price controls and so it is unlikely that FFO / interest coverage would by itself create a binding constraint. The position is more difficult in water and sewerage where regulatory assets have relatively long lives and in electricity and gas transmission where new assets have been depreciated over 40 years.

Ratio 2: (RCF / debt) > 0.09

Retained cash flow is cash flow from operating activities minus interest, tax and dividends. This is a proxy for regulatory depreciation.

Therefore

$$\text{RCF / debt} = \frac{(1/\text{AALR}) * \text{RAV}}{\text{RAV} * \text{Gearing}} \quad (6)$$

$$= \frac{(1/\text{AALR})}{\text{Gearing}} \quad (7)$$

Gearing

Reinstating the inequality and assuming the 57.5% gearing used in the EDPCR allows for the following analysis.

$$\frac{(1/\text{AALR})}{0.575} > 0.09 \quad (8)$$

$$(1/\text{AALR}) > 0.05175 \quad (9)$$

$$\text{AALR} < 19.3 \text{ years} \quad (10)$$

Equations (1) to (5) and (6) to (10) show the importance of the AALR of regulatory assets in determining whether financial ratios form a binding constraint. Generally ratio 2 will be a less onerous constraint than ratio 1, unless inflation drops below 2%. Ratio 2 also deteriorates as gearing increases.

Ratio 3: (Adj FFO / interest payments on debt) > 1.6

While not cited in the 2004 EDPCR the certain credit rating agencies also use measures of adjusted FFO interest coverage in assessing gas and water/sewerage businesses. In Ofwat's 2004 Periodic Review it based its starting point for its financeability assessment on a package of indicators. This included adjusted cash interest cover (funds from operations less capital charges/gross interest) of 1.6x

Adjusted FFO excludes regulatory depreciation and infrastructure renewals charges. Therefore

$$\begin{aligned} \text{Adj FFO}/(\text{interest payments on debt}) &= \frac{(0.055 \cdot \text{RAV})}{0.067 \cdot \text{RAV} \cdot \text{Gearing}} \quad (11) \\ &= \frac{0.055}{0.38525} \\ &= 1.43 \end{aligned}$$

This shows that at a gearing level of 57.5% this ratio would only be above 1.6x, and therefore not be a constraint, if inflation fell below about 1.8%. Adjusted FFO can be increased by allowing a higher return or by assuming a lower level of gearing. This will tend to increase revenue as debt is tax efficient and so lower levels of gearing require higher tax allowances.

Ratio 4: (Debt/RAV) < 0.65

If the regulator assumes that the opening (or average) level of gearing for the regulated firm is consistent with the assumption underlying the costs of capital set by regulators at price reviews then this will typically be lower than 65%. In the case of the EDPCR 2004 the level of gearing assumed in setting the cost of capital was 57.5%.

Three factors determine whether gearing will increase – the level of dividends compared to the $RAV \cdot (1 - \text{gearing}) \cdot \text{Cost of Equity Finance}$, whether any new equity finance is injected into the regulated business and the real growth in RAV over the period.

Assuming that the opening (rather than average) level of gearing in the financial modelling is consistent with the assumption used in setting the cost of capital will produce a more onerous constraint where gearing is rising.

On either basis, for businesses where the RAV is growing consistently for a period of 10 or more years, then it is likely that Debt / RAV ratios would become a constraint unless additional equity was injected into the business.