Report for the CAA by Europe Economics

Regulating Finance for NATS CP3

Europe Economics
Chancery House
53-64 Chancery Lane
London WC2A 1QU
Tel: (+44) (0) 20 7831 4717
Fax: (+44) (0) 20 7831 4515
www.europe-economics.com

29 January 2010

TABLE OF CONTENTS

1 INTRODUCTION

1.1 This note summarises our emerging conclusions on the regulating finance issues on which we are advising the CAA.

1.2 By way of introduction, the underlying problem of concern to the CAA is that bondholders may not view any stated commitment by the CAA not to "bail out" NATS as credible. (Note that from here on, the phrase "bailout" is used as shorthand so as to include a decision by the CAA to adjust price limits in the event that NATS gets into financial distress, as well as the provision of direct financial support to NATS by the government in the event of financial distress.) This is for the following reasons:

(a) The cost structure of NATS – with opex forming a large component of it cost base – makes it unclear whether an administrator would keep the business running.

(b) NATS is an essential service which the UK is obliged to provide under its international legal obligations.

(c) The fact that the composite solution was implemented when NATS was last in financial difficulties may be taken by investors as indicating unwillingness on the part of government and the CAA to allow the company to go into administration.

(d) The Transport Act 2000 contains explicit provisions for government financial support of NATS in the event that it experiences financial distress.

1.3 Given the above, and in particular the experience of bailouts, across many sectors in recent years, wherein bondholders have been kept whole whilst equity-holders have lost out, NATS may have a sub-optimal incentive to over-gear on the basis of an expectation that its bonds will be "bailed out" in the event of financial distress. Effectively, by gearing up NATS would be benefiting from an increased likelihood of additional cash flows from bailout, as well as transferring risk to customers and thus benefiting from a lower asset beta. In addition, NATS would be gaining from the current tax advantages of debt.

1.4 Given the possible exposure of customers to any financial distress that NATS may face, the CAA wishes to consider whether it can improve the way in which it regulates the firm's financial arrangements. At a high level, there are two basic categories of approaches:

(a) Prescribing financial arrangements or imposing constraints – for instance, introducing a limit on gearing or specifying the minimum credit rating which NATS has to maintain.

(b) Providing financial incentives for NATS to maintain appropriate financial robustness.

1.5 We have explored the issue both qualitatively and quantitatively. In this note, we set out our emerging conclusions and present some initial modelling results.

1.6 In our view, it is helpful to distinguish between a first best policy approach (e.g. in a world free of political constraints) and a second best or complementary policy approach (in a

world in which the first best approach cannot be fully and credibly implemented). We make this distinction in the discussion which follows.

1.7 The structure of this report is as follows:

(a) Section 2 sets out background information on gearing and the cost of capital;

(b) Section 3 presents some modelling results;

(c) Section 4 discusses a number of policy options;

(d) Section 5 draws some conclusions;

(e) Appendix 1 summarises the current special administration regime for NATS;

(f) Appendix 2 summarises financial conditions in NATS' licence; and

(g) Appendix 3 outlines approaches to regulating finance used by other regulators.

2 BACKGROUND ON GEARING AND COST OF CAPITAL

2.1 In this section, we first summarise the standard approach to thinking about the effect of gearing on the cost of capital. We begin by introducing the Capital Asset Pricing Model (CAPM) and concepts of risk, and then discuss the Modigliani-Miller (MM) theorem. We go on to consider the risk transfer and tax issues which the CAA has asked us to analyse, which (particularly in the case of the risk transfer issue) move outside the framework of standard MM analysis.

The Capital Asset Pricing Model (CAPM)

2.2 The standard way regulators assess the cost of capital is through the Weighted Average Cost of Capital / Capital Asset Pricing Model (WACC-CAPM) approach. We shall return to WACC in a moment. First, we discuss CAPM.

2.3 CAPM was developed in the 1960s, building on the portfolio analysis work of Markowitz (1958), as a way to estimate the value of assets. The key feature of CAPM is that, given its important assumptions concerning the efficiency of financial markets and that investors care only about the mean and variance of returns, investment returns can be expressed as

$$r = r_f + MRP \times \beta \qquad [1]$$

Where

r is the expected return on the asset

r_f is the return that would be required for a perfectly risk-free asset

MRP is the "market risk premium", that is to say the excess return over the risk-free rate that would be delivered by a notional perfectly diversified portfolio equivalent consisting of all assets ("the whole market")

β is a measure of the correlation between movements in the value of the asset of interest and in the value of assets as a whole. It is also called "beta" (or sometimes the "asset beta").

Returning to WACC: capital structure

2.4 Now let us return to WACC. Utilities typically use a combination of debt and equity. Using the second Modligiani-Miller Theorem, we can show that

$$r = (E/V)r_e + (D/V)r_d = r_f + MRP \times ((E/V)\beta_e + (D/V)\beta_d) \qquad [2]$$

where

V is the total value of the assets of the company

E is the value of the equity

D is the value of the debt

so

$V \equiv D + E$

D/V, the proportion of the total value of the company accounted for by debt is often referred to as the company's "leverage". Clearly, $D/V + E/V = 1$

r_e is the (expected) return on equity

r_d is the (expected) return on debt (note that this is not identical to the coupon rate or yield on debt, since these do not embody probabilities of and losses on default).

2.5 Since the overall return on the asset is a weighted average of the returns on debt and equity, the overall figure is often referred to as the "weighted average cost of capital" (WACC).

2.6 β_e is a measure of the correlation between movements in the value of the company's equity and in the value of assets as a whole. Similarly, β_d is a measure of the correlation between movements in the value of the company's debt and in the value of assets as a whole. Since returns on equity and debt tend to move under different circumstances (e.g. when companies are not in default debt returns differ little but equity returns may differ considerably, whilst when companies are in default equity returns differ little (they are close to zero) whilst debt returns differ markedly (depending on the scale of the default)), equity and debt betas are typically not the same.

Systematic and specific risks

2.7 Under CAPM risks are divided into two major categories:

(a) Systematic risks; and

(b) Specific risks.

2.8 The risks associated with some events are partly systematic and partly specific.

Systematic risks

2.9 The CAPM approach measures a company's exposure to systematic risk.

2.10 Since systematic risks are determined to varying extents by economy-wide factors, they cannot be diversified away by investors. Therefore the company has to compensate its investors for bearing the risk through the cost of capital. Examples of systematic risks might include:

(a) Macroeconomic fluctuations, such as in the rate of growth of GDP — such fluctuations contribute to the willingness to pay for air travel being uncertain;

(b) Changes in interest rates;

(c) Catastrophic events, such as terrorist attack, war, or a global pandemic, undermining demand in so far as they affect the market as a whole.

2.11 Various aspects of a company could affect its exposure to such systematic risks.

Specific risks

2.12 The specific risks affecting an individual firm are those risks that can be offset by investors diversifying their investments. As already indicated, under CAPM it is assumed that in an efficient capital market investors can protect themselves against specific risks by holding a diversified portfolio — implying that specific risks do not affect the rate of return to investors that the company has to cover through its cost of capital.

2.13 To understand this point, consider an industry in which there is no systematic risk, but each of the companies in the industry faces company-specific risk. CAPM predicts that the rate of return in this industry would be the risk-free rate. Since there is no systematic risk, an investment company with equal shares in all the companies in the industry would be guaranteed to receive the risk-free rate every period — the company-specific risks taken that turned out badly in some companies would exactly balance those that turned out well in others (that is precisely what it means to say that there is no systematic risk).

2.14 Examples of specific risks for NATS might include:

(a) Cost over-runs caused by poor management of its IT programmes;

(b) Asset failures requiring unplanned investment in replacement assets.

2.15 Such specific risks do not influence the underlying cost of capital — since, as explained above, in an efficient capital market they can be diversified away by investors, the investors do not require a compensation for them. They should of course be assessed and taken into account in other parts of the regulatory review, for example in settling the projections for the cash flows relevant to regulation.[1]

Standard approach to impact of gearing on the cost of capital

Impact of capital structure

2.16 The most famous result in corporate finance is the Modigliani-Miller capital structure

irrelevance theorem (MM): that in a world without taxes, incentive or information issues, the way a project or firm is financed does not matter. Or, expressed another way, the market value of any firm is independent of its capital structure. Briefly, this is because the overall risk of the company's asset base (some combination of equity and debt), the asset beta, does not change with the capital structure. The company's value depends on the net present value of the expected cash flows of its project stream, not how those cash flows are distributed between equity and debt holders.

2.17 Put more formally, the value of a project (or a company) is equal to the present value of the future discounted cash flows it is expected to generate:

$$V = CF1 + \frac{CF2}{(1+r)} + \frac{CF3}{(1+r)^2} + \frac{CF4}{(1+r)^3} + ...$$

2.18 Hence, if a factor is to affect the value of the company, it has either to change the amount of expected cash flows, or the discount rate *r*, which is the cost of capital. The value of a project or company may change over time for a number of reasons. The expected cash flows of the company might change, for example due to new management taking over that is thought able to use the existing assets more efficiently, or for any of a wide range of other possible reasons.

2.19 Like the expected cash flows, the cost of capital may also change for a range of possible reasons (not necessarily related to a change in the level of gearing). A fall in the cost of capital increases the value of the company, compared to that which had been estimated previously, because the future income stream is discounted less heavily.

Asset beta, equity beta and debt beta

2.20 Recalling the CAPM analysis of the cost of capital, if an observed increase in the value of a company has arisen because of a fall in the cost of capital, that could be due to a fall in the asset beta of the company, a fall in the risk free rate, or a fall in the market risk premium. In the case of the last two, this should be reflected in the values of all companies in the economy.

2.21 The asset beta is a weighted average of the debt beta and equity beta, where the weights are the relative values of debt and equity the company has:

$$\beta_A = \beta_E . \frac{E}{D+E} + \beta_D \frac{D}{D+E}$$

2.22 This illustrates that the asset beta may fall, lowering the cost of capital and thus increasing the value of the company, if the equity beta and/or the debt beta fall. The above equation

---

[1] This has the advantage that specific risks can be more precisely described and managed than if they were to be treated as

is, however, slightly misleading in implying that equity and debt betas determine asset beta. In fact the causality runs the other way under the usual assumptions, from the asset beta (relative risk associated with the future cash flows) to the equity and debt betas, which are only an expression of the chosen level of gearing.

2.23 One should note that according to the theory *both* the cost of equity and debt adjust as gearing increases. In applications observers sometimes assume that the cost of debt is constant while gearing increases. This assumption is neither in line with the MM framework nor realistic. As gearing increases, the debt providers become more exposed to systematic risk due to a lower equity buffer to soak up the effects of shocks. Gearing is also one of the determinants of credit ratings of companies, which in turn have a large effect on the cost of debt for the company. Indeed, credit ratings of companies often fall concurrently with increased gearing, though in general the response in cost of debt might not be large until very high levels of gearing.

2.24 Taking into account the possibility that the cost of debt changes with significant increases in gearing reduces the impact of gearing on the equity beta and the cost of equity. This follows directly from the above equation. Both equity and debt betas rise as gearing increases, since this increases the exposure of both debt and equity holders to variations in income due to systematic risk. Subject to the qualifications discussed below, the implied increase in the cost of both equity and debt offsets savings that would otherwise result from the substitution of debt for equity.

Implications of gearing within the CAPM-WACC Framework

2.25 In order for the financiers of a project to be willing to provide the required capital, they must determine what level of risk they are taking on, and therefore, what level of return they require for their investment. To do this in a CAPM framework, they have to estimate the systematic risk on all of the company's cash flow, the asset beta.

2.26 The asset beta is relevant to the total WACC of the company, not just the cost of equity. If the firm uses no leverage, then the shareholders receive all the project revenues, and the asset beta equals the equity beta. However, when the firm uses debt as well as equity, the equity beta overstates the risk of the company, and the equity beta must be "unlevered" to measure the asset beta.

2.27 Equity beta estimation is routine to both financial markets and regulatory applications. The concept of debt beta might not be as familiar as the equity beta, as debt betas are not referred to as commonly. The return on debt in WACC formulae is most usually expressed as the risk free rate plus a company specific debt premium. This can be thought of as composed of the debt beta and the same general market risk premium as used in the CAPM for cost of equity.

---

requiring an addition to the cost of capital.

2.28 However, the debt premium observed in spreads is likely to include an element of insurance against default on the debt, regardless of whether the default occurs for systematic or idiosyncratic factors. Therefore it will not typically be appropriate to think of all of the debt premium, or spread, as an indicator of market covariant risk covered by the debt beta.

2.29 As mentioned above, it is sometimes incorrectly assumed that debt beta is zero when un-levering the equity beta. This approximation could be valid for companies with low gearing as debt is perhaps exposed to little risk and its share in the asset beta is small as well. However, at high levels of gearing ignoring the debt beta will lead to a higher than required adjustment in the equity beta, and hence in the cost of equity.

2.30 So, under WACC-CAPM, when a company gears up within a realistic range the costs of debt and equity adjust, leaving the asset beta, and therefore the company WACC, unaffected. The overall risk on the asset base is what matters, the cost of equity and debt only adjust to reflect this depending on their relative amounts and the specific terms of different classes of loan.

Impact of other factors recognised in the literature

2.31 Since capital structure is irrelevant according to the principles of MM, should we expect to see completely random capital structures of companies? Of course this is not the case — and one value of the MM theory is that it points us to the reasons why capital structures might matter for a company. The proposition abstracts from: [2]

(a) Taxes — differences in tax treatment of income to financiers from equity and debt finance may imply that increasing gearing will increase company value, depending on the value of the debt tax shield. One expression of this idea is that the value of a company is equal to its value if financed wholly by equity plus the value of any tax saved through the use of debt finance.

(b) Incentive issues — financial structure may affect incentives that, for example, the managers have to maximise the net present value of the company.

(c) Costs of financial distress — in the absence of other distortions, the expected costs of financial distress to all parties will rise with the level of gearing.

(d) Information issues — the information that different market participants have access to at different times might vary; and

(e) Transaction costs — for example, in changing the level of gearing.

[2] MM proposition 1 also assumes efficient well functioning capital markets.

2.32 These and other effects will trade off against each other such that an optimal level or range of gearing arises, specific for a particular company.

2.33 While the implications of the tax advantages of debt for capital structure have been widely discussed in the literature, the risk transfer issue identified by the CAA represents a new issue which to our knowledge has not received wide attention. The risk transfer issue moves outside the traditional MM framework since it means that a company's underlying cash flows become affected by gearing (since gearing up increases the likelihood of additional cash flows from a "bailout"). We note that in many markets the risk transfer issue would not be relevant as firms would not expect to receive external financial assistance from a regulator if they were in financial distress. However, given the recent history of government bailouts for firms considered too large to fail in particular sectors (e.g. banking bailouts around the world, support for the car industry in the US), the issues identified by the CAA have become potentially relevant for corporate finance theory not just in relation to utility sectors but also in relation to other strategic sectors of the economy.

The cost of debt and specific risk

2.34 There is an additional issue relating to the effect of gearing on regulatory assessments of the cost of capital.

2.35 In corporate finance theory, only systematic risks should affect the cost of capital. However, the way in which regulators have typically set the WACC means that specific risks may, in fact, be factored into regulatory assessments of the cost of capital through assumptions made on the cost of debt. Further, as discussed below, this has the effect that specific risks may bias regulatory assessments upwards by a greater amount for higher levels of gearing.

2.36 To explain this point, it is important to distinguish between *promised* returns (e.g. the observed yield on bonds or the rate of interest charged by banks) and *expected* returns to providers of debt once the possibility of default is taken into account. Since the risk of bankruptcy is higher for a more highly geared structure, *promised* returns will need to be higher in order for debt providers to have the same *expected* returns. This is true regardless of whether the possibility of default is caused by specific or systematic risks.

2.37 Under CAPM, it is the expected return which needs to be equal to or greater than the cost of capital in order to persuade investors to finance a project. Hence, if a regulator were to set the regulatory WACC at the true underlying cost of capital then it would set the cost of debt on the basis of evidence on expected returns to debt providers (i.e. adjusting promised returns downwards to take account of default risk). This would reduce the cost of debt assumption in the WACC calculation.

2.38 However, removing the default risk premium from observed yields on bonds would be controversial because regulators have not typically made such an adjustment in the past. There is an interesting and complex discussion to be had as to whether an adjustment of this nature is theoretically appropriate.

2.39 In the absence of such an adjustment, however, the cost of debt used by regulators typically includes a default risk premium which covers both specific and systematic risks. As this default premium is higher for more highly geared capital structures, the implication is that specific risks will bias regulatory assessments of the cost of capital upwards by a greater amount for more highly geared structures. This effect is explored in our modelling in the next section, where we show the impact on the overall WACC of estimating the cost of debt respectively on the basis of expected and promised returns.

3 MODELLING RESULTS

3.1 This section presents the results of high level modelling that we carried out in order to investigate the potential magnitude of the gearing effects described in the previous section. Our modelling looks at the following:

(a) The benefits from gearing up due to the tax debt shield;

(b) The benefits from gearing up due to the higher probability of a bailout occurring (due to the higher probability of financial distress).

3.2 The possibility of bailout gives rise to two types of benefit, both of which need to be considered. To understand these benefits, let us remember that the value of a company is equal to the future cash flows it is expected to generate, discounted at the cost of capital. Hence, the value of a company will change if either its projected cash flows change and/or there is a change in its cost of capital. Now, where there is a possibility of bailout this will increase the value of the firm through both mechanisms. In particular:

(a) Projected cash flows will increase, since in the event of financial distress there is a possibility that the firm will receive additional cash.

(b) The cost of capital will fall, since some of the systematic risk associated with the firm's operations will now be borne by customers and/or taxpayers (depending on the source of the bailout cash).

3.3 Hence, in the modelling in this section we separately calculate the bailout benefits from gearing up due to higher expected cash flows and a lower cost of capital.

Benefits of Tax Debt Shield

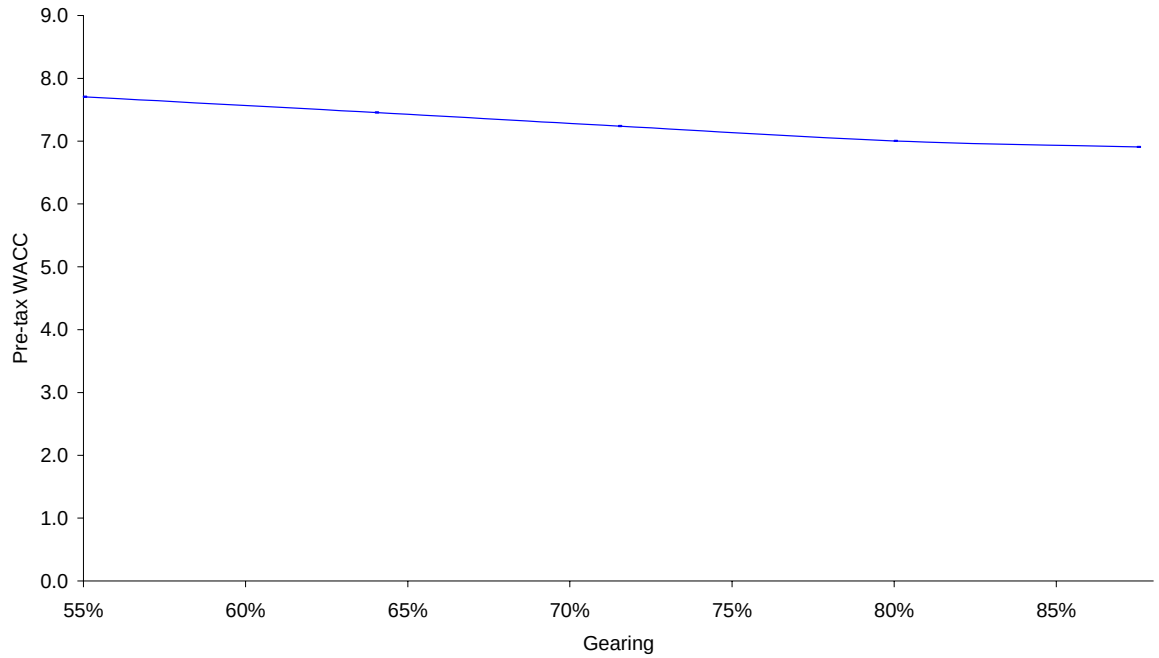
Modelling results

3.4 The benefit of the tax debt shield at different levels of gearing is straightforward to model, using the standard WACC formula and uplifting the cost of equity using an effective tax rate for NATS of 35 per cent.

3.5 The results of these calculations are shown in the chart below. The calculations have been calibrated to be consistent with the provisional cost of capital recommendations given separately in our paper on the cost of capital.[3]

[3] Europe Economics, "Cost of capital and regulating finance for CP3; Draft", 16 November 2009

Figure 3.1: Effect of gearing on pre-tax WACC



Source: Europe Economics calculations

3.6 The chart shows the value of the tax debt shield: NATS pre-tax WACC declines significantly due to this benefit as gearing increases.

Reduction in Systematic Risk from Possibility of Bailout

3.7 Next, we present some modelling which explores the possible magnitude of any reduction in the WACC resulting from greater transfer of risk to customers as gearing increases, through a higher probability of bailout.

3.8 We would emphasise that the calculations presented here do not capture the potential effect of a bailout possibility on the expected cashflows of the firm. This gives rise to a further benefit to the firm in addition to the reduction in the WACC, and is covered by separate modelling results later in this section.

Summary of modelling approach

3.9 Our model calculates the vanilla WACC across a range of gearing levels both with and without the possibility of bailout. The basic assumption used in the modelling is that the introduction of the possibility of bailout reduces the cost of debt at any gearing level (because of the greater protection afforded to bondholders), but does not affect the cost of equity at that gearing level (since it is assumed that shareholders would not be spared by any bailout). For completeness, we describe the steps in the modelling in more detail below, and then present and discuss the results of this modelling.

3.10 In both the case in which there is a possibility of bailout and in the case in which there is not, the vanilla WACC is calculated in two possible ways:

(a) With the cost of debt based on *promised* returns (i.e. the observed yield on corporate bonds);

(b) With the cost of debt based on *expected* returns (i.e. with the corporate bond yields adjusted downwards to remove the default premium).

3.11 The reason for distinguishing between promised and expected returns was discussed at the end of section 2, and its significance for the WACC becomes clearer when we present results.

3.12 Since the matter of interest is how the cost of capital is affected by changes in gearing, we consider that for these purposes it is essential to take full account of the debt beta. Further, given the range of gearing levels considered in our calculations, we consider that it would be inappropriate to assume that the debt beta is the same at all gearing levels. Hence, our approach not only factors in a debt beta but also assumes that the debt beta will rise with gearing.

3.13 The calculations begin by looking at the case in which there is no possibility of bailout. In particular, we:

(a) match credit ratings to gearing levels assuming no possibility of bailout (which means removing the one notch uplift currently given by at least one rating agency);

(b) decompose the debt premium for each credit rating to calculate the debt beta;

(c) estimate an equation for the relationship between gearing and debt beta to allow estimation of a debt beta for the notional level of gearing assumed in our cost of capital estimate;

(d) calculate an asset beta for NATS by unlevering the equity beta used in our cost of capital estimate, but taking the debt beta into account;

(e) use the asset beta to calculate equity betas and hence the vanilla WACC at different levels of gearing.

3.14 The calculations then extend to the case in which the market factors in the possibility of a bailout (which we take to be the *status quo* situation). The effect of the potential for bailout is estimated on the basis of a Standard and Poor's statement that NATS was

given a one-notch upgrade to reflect its assessment of "the potential for extraordinary government support".[4] In particular, we:

(a) estimate that a one notch uplift for NATS implies that rating agencies are implicitly assuming a probability of around 34 per cent that bondholders will be bailed out in the event of financial distress;[5]

(b) recalculate the debt beta at each gearing level taking account of the uplift to NATS' credit rating (and hence the reduction in its debt premium) and the changed probability of default on its bonds;

(c) for each gearing level, estimate the vanilla WACC with the possibility of bailout using the new debt beta but assuming the equity beta is unchanged by the possibility of bailout (since shareholders would not be spared).

3.15 We note that the assumption that the equity beta is unchanged by the possibility of bailout could be criticised from two directions. On the one hand, the lower cost of debt resulting from the possibility that bondholders may be bailed out will mean lower interest payments and hence a higher profit margin to absorb shocks, which will tend to reduce the equity beta. On the other hand, it can be argued that the possibility of bailout for bondholders may actually increase the cost of equity, since government intervention in the event of financial problems may wipe out any residual shareholder value (as has arguably happened in some historic instances of bailout). However, we consider that assuming the cost of equity remains unchanged represents a reasonable working assumption to allow estimation of the possible effect of the potential for bailout on the overall WACC.

3.16 In our calculations, we have used net debt / RAB as our definition of gearing, since this is the definition which rating agencies focus on and hence which can be used most readily to link gearing levels with credit ratings. We note that, as the firm takes on more debt, the possibility of bailout will drive an increasing wedge between this measure of gearing and net debt / enterprise value. This is because the possibility of bailout increases the enterprise value of the company, tending to reduce gearing on the latter definition.

Results

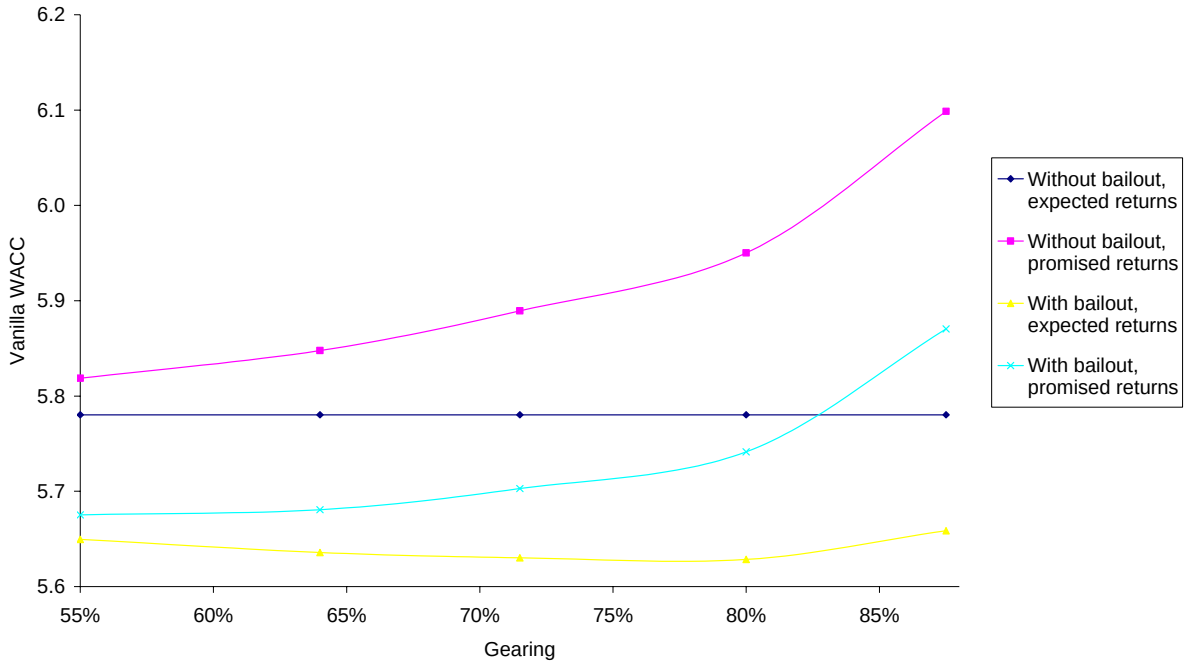
3.17 Our results are presented in the chart below. Note that the y-axis starts at 5.4 per cent to allow movements in the vanilla WACC to be observed more clearly. Further, note that the reference to "expected returns" means that the cost of debt has been estimated by adjusting bond yields to remove the default premium. It does *not* mean that higher expected returns from bailout cash flows have been factored in (since here we are

[4] Standard and Poor's, "Global Airports Face Challenges Not Seen in Decades", May 2009, p.8

[5] This was calculated using data on marginal default probabilities for bonds rated A2 and A3 derived from Moody's idealised default probability table. The reduction in the probability of default implied by a one-notch upgrade (from A3 to NATS' current rating of A2) can be used to infer the implicit probability of bailout that is being assumed.

presenting the WACC – i.e. the minimum expected return required by investors – and not an estimate of actual expected returns).

Figure 3.2: Effect of bailout possibility of vanilla WACC (with y-axis starting at 5.4 per cent)



Source: Europe Economics calculations

3.18 The results show that:

(a) In line with the Modigliani-Miller theorem, the vanilla WACC is constant for all gearing levels with no bailout and when the cost of debt is calculated on the basis of expected returns.

(b) When the cost of debt is calculated on the basis of promised returns (i.e. including the default premium), the WACC is higher as gearing increases. This is because the default premium in the cost of debt is larger at higher gearing levels, biasing the WACC upwards to a greater extent for higher levels of gearing.

(c) The possibility of bailout reduces the WACC, as one would expect.

(d) As shown by the yellow line, the reduction in the WACC is greater as gearing increases for most of the gearing range considered. However, the effect appears to be small – for instance, increasing gearing from 55 to 80 per cent reduces the vanilla WACC (based on expected returns) by only 0.02 per cent. Hence, our results suggest that, while the CAA's concerns may be right in theory, it is unclear how significant they are in practice with respect to effects on the cost of capital (as noted, below we model the much larger effects upon expected cash flows). We note that

uncertainty over estimation of the cost of capital is likely to be materially greater than this.

(e) The light blue line shows that, with a bailout possibility and when the WACC is calculated on the basis of promised (rather than expected) returns, the WACC first increases with gearing. This is because the effect of including the default premium in the cost of debt outweighs the reduction due to transferring risk to customers.

3.19 It might be asked, what exactly is the mechanism that causes the WACC to fall as gearing rises when there is the possibility of bailout?

3.20 First, is the MM theorem valid in this instance? The answer is that, when there is a possibility of bailout, the MM theorem no longer applies in its standard form because the company's expected cashflows depend on the capital structure of the firm. In other words, at higher gearing levels the expected cashflow from bailouts is higher because the firm is more likely to end up in financial distress.

3.21 Second, the possibility of bailout affects the asset beta of the firm as well as expected cashflows, with this effect being more pronounced at higher gearing levels. This is because at higher gearing levels it is more likely that systematic shocks will end up leading to a bailout, with the result that gearing up means that risk is transferred from providers of finance to customers and/or taxpayers.

3.22 Third, the way in which this feeds though in our calculation is through changes in the way in which the cost of debt changes with gearing. Under MM, as a firm increases leverage the greater weight placed on cheaper debt rather than expensive equity in the WACC calculation does not reduce the overall WACC because gearing up also increases both the cost of equity and the cost of debt. However, with a bailout possibility this no longer applies: as the firm gears up more weight is placed on cheaper debt but the cost of debt does not rise as much as it otherwise would because part of the increase in systematic risk borne by the debt is being passed through to customers and/or taxpayers (and increasingly so at higher gearing levels).

3.23 Putting the above in a slightly different way, it is worth emphasizing that the contention that the WACC actually falls is crucially connected to the assumption that the cost of equity is exactly as it would have been, at each gearing level, in the absence of the implicit bailout possibility. Next, note that in the absence of a bailout promise, the cost of debt would tend to rise slightly with gearing (at least above some threshold) since when gearing is higher the risk of default is higher and so the risk on debt is higher. But with the bailout possibility, the cost of debt rises more slowly than it would do otherwise. So, if the cost of equity is rising at the rate that would have kept the WACC invariant (as per MM) with the cost of debt rising more rapidly, when the cost of debt rises less rapidly the WACC must, mathematically, be falling.

3.24 It is also worth noting that the message of Figure 3.2 should not be taken at quite face value. There are factors that determine an optimal capital structure for firms — the

WACC is probably not invariant across the whole range, as indicated by MM, because the capital structure probably does affect cash-flows in a number of ways (e.g. by affecting the monitoring of firms and the incentives of managers). These factors would surely affect firms subject to bailout possibilities, also, and hence the (privately) optimal capital structure would probably not involve 100 per cent debt, as the figure appears to imply. But it *is* likely that the (privately, though not socially) optimal capital structure for firms with bailout possibilities involves more debt than that for a firm without such possibilities.

3.25 Drawing the above thoughts together, the tentative conclusion appears to be that, in addition to clawing back the benefits of the tax shield on debt, the CAA would only need to introduce a fairly modest penalty for high levels of leverage in order to ensure that the firm did not benefit from a lower WACC by passing risk through to its customers. However, there is a further benefit to the firm from gearing up in the form of higher expected cash flows from bailout, which is conceptually distinct from and additional to, the reduction in the WACC. The adjustment mechanism would also need to claw back this increase in expected cashflows in order to act as a deterrent to excessive gearing. We turn to this below.

Increase in Projected Cash Flows from Possibility of Bailout

3.26 This last benefit from gearing up (in a context where bailouts are possible) relates simply to the fact that the value of the firm will increase because of the possibility that it will be provided with additional cash, with this cash injection becoming more likely the higher the level of gearing.

3.27 We have carried out stylised calculations to model the potential size of this benefit. These calculations make the following simplifying assumptions:

(a) There is a constant marginal probability of NATS entering a default situation each year. (By "default situation", we include situations in which default would have occurred without a bailout, as well as situations in which default actually occurs.)

(b) If a default situation occurs, there is a 34 per cent probability of bailout (based on our calculations of the probability implicit in a one-notch mark-up to NATS' credit rating, as discussed above).

(c) If the firm is permitted to default (i.e. there is no bailout), the loss given default (LGD) suffered by bondholders is 58 per cent (in line with typical LGD figures for bonds with a rating of A and BBB).

(d) If a bailout is provided, shareholders lose all of their capital but bondholders are completely protected. This means the financial cost of a bailout can be estimated as the LGD that would otherwise occur multiplied by NATS' net debt (which can in turn be computed by multiplying NATS' RAB by the assumed level of gearing). (We note that in certain recent bailouts, although bondholders were almost certainly assisted by the bailouts, there were *some* losses – either in the form of suspected coupons or directly through writedowns.)

(e) For simplicity, NATS' RAB is assumed to stay constant through time. (We use a RAB figure taken from NATS' Regulatory Accounts for 2008/2009.)

(f) If a default situation occurs, it is assumed that the firm is then subject to complete financial restructuring such that the possibility of any further bailouts in later years is irrelevant to investors who provide finance to NATS today. In other words, we do not factor in the possibility of multiple bailouts in different years.

3.28 Under these assumptions, we calculate the present value of expected future cash flows from bailout, discounted using the pre-tax WACC applicable at the assumed level of gearing.

3.29 Our results are presented in the table below.

Table 3.1: Expected cash flows from bailout

Gearing (%)	PV of expected future cash flows (£m)
55	2
64	3
72	5
80	8
88	15

Note: The choice of gearing levels was determined by certain aspects of the data.

Source: Europe Economics calculations

3.30 The table shows the very significant effect of expected bailout cash. Further, it can be seen how the size of the impact increases sharply with gearing. It is also, perhaps, worth noting that the effect accelerates dramatically after about 80 per cent gearing.

3.31 In practice, making an adjustment to price limits to remove the benefits of expected bailout cash flows would have feedback effects which are not taken into account in our calculations. In particular:

(a) The reduction in price limits to claw back this benefit would make a default situation more likely. This is because NATS' revenues would be reduced in the non-default situation as part of the claw back mechanism, whereas the additional cash flow would only actually materialise in a default situation.

(b) For any given shock leading to a default situation, the required size of bailout (or conversely, the LGD if the firm is permitted to default) would increase. This is because the reduction in NATS' price limits resulting from the adjustment would reduce the amount available to pay bondholders if a default situation occurs.

4 OPTIONS FOR REGULATING FINANCE

4.1 In this section, we discuss a number of discrete policy options for regulating NATS' finance. Many permutations are possible on the precise options we present, and the CAA should not necessarily limit itself to the precise permutation we have used for the purpose of discussion.

4.2 The options we consider are as follows:

(a) "Do nothing";

(b) Strengthened special administration regime;

(c) Clawback of tax benefits;

(d) Prohibition on high gearing;

(e) Punitive incentive mechanism to deter high gearing; and

(f) Strengthened licence conditions.

4.3 Not all of the policy options are mutually exclusive. Clearly, the first option ("do nothing") is by definition incompatible with all of the other options. The options of prohibiting high gearing or using an incentive mechanism could be seen as stylised alternatives (although we argue later that the CAA might opt for a hybrid of the two, involving an incentive mechanism for a certain gearing range combined with a prohibition on gearing above a specified level). Other than that, however, the various options could be implemented alongside each other.

4.4 We discuss each of the options in turn below, and then set out our suggested approach.

"Do Nothing" Option

4.5 One option is to leave the current arrangements as they are. We include this option for completeness.

4.6 The analysis in section 3 illustrates the incentives for gearing up that potentially exist under the current regime, both due to the tax shield on debt interest and due to the possibility that NATS might receive extraordinary financial support in the event of financial distress.

4.7 NATS licence contains a number of conditions relating to its financial arrangements (summarised in appendix 2) that may provide some protection for customers. However, it is not obvious that these would prevent NATS from over-gearing. For instance, while NATS is required to maintain an investment grade credit rating, it may be able to do this at higher gearing levels than would otherwise be possible if rating agencies are factoring the possibility of a bailout into their assessments of NATS' creditworthiness.

Strengthened Special Administration Regime

4.8 Our view is that the first best solution is for the private sector to bear and manage the economic risks associated with owning and managing air traffic control services. We believe that it would be possible to design and manage a regulatory framework implementing something very close to this first best.

4.9 We should distinguish between two consequences of insolvency:[6]

(a) *Liquidation* ("winding up" and "dissolution") is a process by which a company is brought to an end and its assets redistributed.

(b) *Administration* is a process by which the company is (i) run in the interests of the creditors (as a whole); and (ii) an attempt is made to rescue the company as a going concern. (If it proves impossible to salvage the company as a going concern, it can then be liquidated in the interests of the creditors as a whole and also potentially to maximise the recovery of the creditor(s) that called in the administrator.)

4.10 From the point of view of a key service such as NATS, liquidation would be highly problematic, as it would presumably mean a period of interruption in air traffic control services, causing huge disruption. Insofar as administration might imply the withdrawal of certain services (say, the least profitable elements of NATS) or might lead to liquidation, this would be equally problematic.

4.11 Consequently, NATS is subject to a special administration regime, set out in Section 26ff of the Transport Act 2000.[7] Key features of this regime are summarised in an appendix to this note.

4.12 This regime includes provisions (set out in Section 31 of the Act) for the government to provide various kinds of financial support in the event of administration.

4.13 We believe that the key features of a no-bailouts first best policy would be:

---

[6] In the UK, under the Insolvency Act 1986 (in Section 123, http://www.insolvencyhelpline.co.uk/insolvency-act/p04c6_2.php#123), a company is defined as insolvent (unable to pay its debts as they become due) thus:
(1) A company is deemed unable to pay its debts -
(a) if a creditor (by assignment or otherwise) to whom the company is indebted in a sum exceeding […] then due has served on the company, by leaving it at the company's registered office, a written demand (in the prescribed form) requiring the company to pay the sum so due and the company has for 3 weeks there-after neglected to pay the sum or to secure or compound for it to the reasonable satisfaction of the creditor, or
(b) if, in England and Wales, execution or other process issued on a judgment, decree or order of any court in favour of a creditor of the company is returned unsatisfied in whole or in part, or
(c) if, in Scotland, the induciae of a charge for payment on an extract decree, or an extract registered bond, or an extract registered protest, have expired without payment being made, or
(d) if, in Northern Ireland, a certificate of unenforceability has been granted in respect of a judgment against the company, or
(e) if it is proved to the satisfaction of the court that the company is unable to pay its debts as they fall due.
(2) A company is also deemed unable to pay its debts if it is proved to the satisfaction of the court that the value of the company's assets is less than the amount of its liabilities, taking into account its contingent and prospective liabilities.

[7] http://www.uk-legislation.hmso.gov.uk/acts/acts2000/pdf/ukpga_20000038_en.pdf

(a) That at the point of administration the administrator is indemnified for losses (cf Section 31.b of the Act).

(b) That in administration the administrator's duty is to continue the operation of all key strategic services, in the broad public interest rather than the interest of any group of stakeholders.

(c) That if additional financial support is provided to the entity, either in the form of loans or in the form of re-calculating its price limits, to maintain its operation in administration or to facilitate its sale to a new buyer, a determination be made of the value added to the company by this additional financial support. Let us call this value Z.

(d) That if the company is sold after or with additional financial support, value Z be deducted from the sale value of the company, before compensating bondholders.

(e) That if the company is not sold, but instead nationalised, under administration, that a estimate be produced of the liquidation value of the company's assets, under the price caps applicable at the point of administration. This liquidation value should form the basis of compensating bondholders (and, if there is residual value, shareholders).

4.14 We are not convinced that it should be impossible to maintain the operation of all strategic services of the company whilst at the same time creating the possibility that bondholders lose out.

4.15 It is important, however, to stress that the ambition of the above is not that bondholders should *always* suffer loss. Fairly often, administration leaves bondholders whole. There may also, in principle, be scenarios in which financial distress is the *result* of government policies against which the government might wish to protect bondholders (or even equity holders). We seek only to spell out a mechanism in which, in principle, there could be loss to bondholders, not to make the holding of bonds less attractive than would be natural in an efficient market environment. Such a mechanism has value, we believe, because without it there could be difficulty in enforcing bondholder losses under any scenario at all.

4.16 The role of the Government and the natural uncertainty that surrounds its approach to financial difficulties at NATS shapes the environment in which the CAA sets policy. For example, it is the DfT that appoints a special administrator, and it is the Government which has, by international agreement, an obligation to provide air traffic services. Further, our understanding is that changes to the special administration regime would require legislative change, and would therefore require action on the part of the government.

4.17 These factors may limit the scope for the CAA to deliver our first best policy approach (strengthening the special administration regime), even were it to be persuaded by our arguments.

4.18 In addition, even if special administration is regarded as a credible threat, the CAA may consider that the disruption and cost involved in special administration makes it something to avoid if possible.

4.19 So, either as a complement or alternative to strengthening of the special administration regime, it could be useful to implement a mechanism to deter NATS from increasing gearing to an excessive level and to protect customers from the effects of financial distress. Possible mechanisms are discussed in the following sub-sections.

Clawback of Tax Benefits

4.20 One policy option would be to claw back the tax benefits of gearing up above the notional level of gearing (or above some other specified level of gearing, which might be higher than the notional level).

4.21 A clawback could be applied in at least two ways:

(a) Automatically within CP3, through a term in the price control formula; or

(b) *Ex post* at the next price review i.e. so that any tax benefits from gearing up during CP3 are passed back to customers in CP4.

4.22 Given that the CAA uses a pre-tax cost of capital to allow for tax liabilities, the most straightforward way to implement this policy through a term in the price control formula (if this were the CAA's preferred approach) would be to adjust the WACC figure to reflect actual gearing, if NATS were to gear up above the specified level. The cost of debt and post-tax cost of equity would need to be increased to reflect the higher gearing level (reflecting the fact that higher financial leverage increases the risks borne by both equity and debt), but overall the pre-tax cost of capital would be expected to fall due to the tax shield on debt. The WACC figure that would apply at different gearing levels would be specified by the CAA in advance — this would ensure that the mechanism was predictable and would avoid any need for the CAA to carry out WACC recalculations partway through CP3.

4.23 We presented modelling results in section 3 which illustrated how the pre-tax WACC changes with gearing.

4.24 Below, we provide further analysis of a tax clawback mechanism, in turn discussing regulatory precedents, possible future changes in the tax regime and regulatory mechanisms for addressing this tax uncertainty.

Regulatory precedents

4.25 There are regulatory precedents for adjusting price controls to claw back the tax benefits of gearing up. Below, we set out the approach that has been adopted by Ofwat and Ofgem, in order to illustrate how an adjustment for tax benefits might be implemented in practice.

Ofwat

4.26 Unlike the CAA, Ofwat does not use a pre-tax cost of capital to allow for tax liabilities faced by the water industry. Instead, Ofwat uses a post-tax cost of capital and includes a separate allowance for tax liabilities within price limits.

4.27 In calculating allowances for tax liabilities, Ofwat uses the notional level of gearing for companies with gearing below the notional level, but actual gearing for companies with higher gearing (thus passing the tax savings of higher gearing through to customers).

4.28 Further, in its methodology paper for PR09 Ofwat also explained that it would claw back the tax benefits from any refinancing during the price control period at the next review:[8]

> "For the 2014 review, we will claw back on a net present value (NPV) netural basis the tax benefits resulting from a company gearing up during the 2010-15 price review period where:
>
> — there is a one-off step change in gearing resulting from a financial restructuring; and
>
> — subject to passing the above test, interest costs in any subsequent year within the price review period exceed those assumed in setting price limits.
>
> The trigger will capture increases in gearing that result from refinancing or a return of capital to shareholders."

Ofgem

4.29 Like Ofwat, Ofgem also uses a post-tax cost of capital and allows for tax liabilities separately within price controls.

4.30 Ofgem's general policy is to claw back the tax benefits from gearing above the notional level. In other words, it sets tax allowances *ex ante* but adjusts the price control *ex post* if actual gearing and actual interest payments exceed the assumed amount.[9]

4.31 An open letter to the electricity distribution licensees, gas transporter licensees, electricity transmission licensees and other interested parties outlines the procedure for assessing these benefits in more detail:[10]

(a) Compare the actual gearing to the notional gearing, defined as the year end net debt or year end RAV. If the former is higher than the latter, then:

---

8 Ofwat (March 2008), "Setting price limits for 2010-15: Framework and approach"
9 Ofgem, Electricity Distribution Price Control Review, 5th December 2008, p.97
10 Ofgem, Fletcher, Rachel, Letter "Clawback of tax benefit due to excess gearing" July 31st 2009, Ofgem. http://www.ofgem.gov.uk/Networks/Documents1/Tax_Clawback_Open_Letter%20July09.pdf

(b) Compare the actual interest to the modelled interest. If the former is higher than the latter, then:

(c) The excess relief is calculated as actual interest – modelled interest. This is multiplied by the corporation tax rate (30 per cent until 31st March 2008 and 28 per cent from the 1st April 2008). This determines the clawback adjustment.

(d) If this adjustment is lower than the modelled tax allowance, then it is deducted from the revenue allowance in subsequent price controls in an NPV-neutral manner. If it exceeds the tax allowance then the excess is added to the tax loss assumed by the regulator and carried forward to be taken into account in the period in which Ofgem's modelling suggests the firm will have to start paying corporation tax.

Possible changes in tax regime

4.32 A general election will be held in the UK no later than 3 June 2010.[11] Hence, in thinking about the tax benefits of gearing it is important to consider relevant changes to the tax regime that may be implemented following the election.

4.33 Important potential tax changes include changes in the corporation tax rate, changes in capital allowances and various reliefs, and changes in the tax deductibility of interest. All of these changes could affect the tax liabilities of NATS

4.34 More generally, future changes in the corporation tax and debt interest tax regimes cannot be ruled out regardless of whether or not there is a change in government, especially given the UK government's large budget deficit.

4.35 It is important to note that changes in the corporate tax regime would not just affect a gearing adjustment mechanism – the pre-tax WACC would also be affected.

Taking account of uncertainty in tax regime

4.36 Given the uncertainty over the tax regime which will apply over CP3, the question arises as to how the CAA should "future proof" its determination on the cost of capital along with any gearing adjustment mechanism which it introduces.

4.37 This question should be seen as relating to the wider issue of the regulatory mechanisms that are available for dealing with uncertainty, rather than being seen specifically as a cost of capital issue. In other words, the same regulatory tools that can be used to address uncertainty in other areas are just as relevant when the uncertainty relates to the tax regime.

[11] http://www.electoralcommission.org.uk/faq/elections/what-is-the-last-possible-date-for-a-general-election

4.38 While a full treatment of approaches to taking account of uncertainty is outside the scope of this paper, some of the key options available to the CAA are as follows:

(a) *Leave the risk of changes on the tax regime on shareholders*. Under this option, no adjustment would be made to take account of changes in the tax regime during CP3. This has the advantage of simplicity, and is consistent with how most sources of uncertainty are treated within the framework of incentive regulation. However, in this instance there is little (if any) benefit in terms of incentives, given that changes to the tax regime are outside the control of NATS management. Further, this approach might be considered undesirable if there are concerns about the possibility of NATS suffering financial distress, since it would leave NATS fully exposed to any adverse changes in the corporate tax regime. Conversely, customers would not receive any benefit from exogenous changes in the tax regime which reduced NATS' tax liabilities during CP3.

(b) *Make a commitment to re-open the price control to adjust the tax allowance, in the event of material changes to the tax regime during CP3*. This would allow changes in the tax regime to be taken fully into account. However, it would have the disadvantage of requiring regulatory intervention to adjust price limits partway through a price control period.

(c) *Include an automatic adjustment within the price control formula to take account of changes in the tax regime*. Such an adjustment mechanism would be most easy to design and implement for changes in the basic parameters of the tax regime, such as changes in the headline rate of corporation tax. However, it would be hard to design a formula which captured (for example) the effect of detailed changes in the rules for capital allowances on NATS' effective tax rate.

(d) *Commit to making an ex post adjustment for tax changes during CP3 at the next price review*. The CAA could commit to making any such adjustment NPV-neutral, as compared with adjusting price limits at the time of the tax reform. However, this could leave NATS exposed to financeability problems in the meantime in the event of adverse changes in the tax regime.

(e) *Some combination of the above*. For instance, the CAA could define a materiality threshold, with changes in tax liabilities caused by tax reforms taken into account at the next review if they fall below this threshold, but with provisions for a price-control re-opener to adjust tax allowances if they rise above this threshold.

Prohibition on High Gearing

4.39 Another policy option would be to prohibit high gearing, with the prohibited level set somewhere above the notional level of gearing used in calculating the WACC.

4.40 The idea of setting the prohibited level above the notional level would be threefold. First, it would allow for the uncertainty surrounding estimation of a reasonably efficient gearing level when setting the allowed WACC. Second, it would allow for the possibility that the

efficient gearing level might increase during the course of CP3. Third, it would provide some leeway to NATS in the event that unexpected shocks increased its gearing (possibly only temporarily) above the level intended.

4.41 Clearly, an important design issue for such a mechanism is what level of gearing should be prohibited. Our recommended cost of capital is based on notional gearing of 60 per cent (see our separate paper).[12] The CAA tentatively suggested that the prohibited level might be set at 65 per cent, allowing a 5 per cent margin for error. In our view, such a narrow range would be unduly restrictive, and if a probative approach were adopted we consider that it would probably be appropriate for the prohibition to kick in at a somewhat higher level than this.

4.42 We consider that there are a number of disadvantages to a blanket prohibition which kicks in at too low a level of gearing, including:

(a) It is arguably not consistent with the principle of incentive regulation, in which the regulator sets price limits and permits the company to find the most efficient way of doing business (including the most efficient financial structure). A prohibition could prevent NATS from adopting the most efficient financial structure, since it is possible that this could involve high gearing (even after the perverse effects of bailout have been removed from decision-making).

(b) There may be problems in defining gearing. While defining gearing as net debt / RAB (rather than net debt / enterprise value) avoids problems associated with fluctuations in market value, there may nonetheless be some circumstances in which it is unclear whether a particular form of financial should be regarded as debt or equity. For instance, a highly gearing company might use tranches of debt in which default on the most risky debt does not necessarily lead to a default for the company as a whole. In this case, the risky debt would have equity characteristics. (We note that the same definitional problems would apply to the incentive mechanism discussed later, since this would involve adjustments kicking in at defined levels of gearing.)

(c) There are a whole of reasons why gearing might fluctuate in the short term and put NATS in breach of the prohibition, even if such a breach were temporary, not deliberate, and did not pose any material risk to the financial robustness of the company. For instance, one could envisage a firm taking out a large, but temporary, bank overdraft to ride out short-term cash flow problems.

(d) The prohibition would need to be enforceable for the mechanism to work. The ultimate sanction of revoking NATS' licence could well be seen as too draconian for such a threat to be plausible. One possible sanction would be cash-lock conditions if gearing rises above the prohibited level.

---

[12] Europe Economics, "Cost of capital and regulating finance for CP3; Draft", 16 November 2009.

4.43 Hence, our view is that there would be merit in using a punitive incentive scheme (of the kind discussed below) to deter excessive gearing up when leverage is moderately high, but with a prohibition on very high gearing levels acting as a backstop. We discuss this further in setting out our suggested approach at the end of this section.

More subtle variant — Prohibition based on average gearing with monthly tolerance

4.44 Though a straightforward prohibition would be subject to the critique above, a more subtle variant might be more attractive. This could be made up of the following five key elements:

(a) A prohibition on average leverage exceeding the chosen threshold, set a little above the notional gearing level as per the original variant of the prohibition — say, if the notional gearing were 60 per cent, then the average level prohibition would be 65 per cent. This "average" would be calculated on a rolling twelve-month basis.

(b) A requirement for the company to report to the CAA if the gearing level at any point were to exceed the average annual prohibition; and account of why the figure had risen; and a description of any measures taken to get the average gearing back down.

(c) A prohibition on gearing over any one month (on the "point gearing") exceeding the average gearing threshold by some tolerance margin. Thus, if the maximum average rolling twelve-month gearing were 65 per cent, perhaps the maximum point gearing would be 68 per cent.

(d) Gearing to be defined accounting to standard accounting definitions of debt vs equity, but with the understanding that the measures are to be interpreted in discretionary/principles terms, rather than offering the opportunity for regulatory gaming by playing upon definitions of debt.

4.45 In our view the above concept is much more practicable than a straightforward prohibition, and could be made to work.

Punitive Incentive Mechanism to Deter High Gearing

4.46 An alternative to a blanket prohibition on high gearing would be to introduce financial disincentives to gearing up, over and above clawback of the tax benefits.

4.47 The rationale for such a mechanism, and the principles on which it should be based, might be as follows:

(a) It is unattractive for there to be a simple cap on gearing, because gearing naturally fluctuates and might temporarily and inadvertently rise materially above its efficient level. It would be unattractive for such natural fluctuations to trigger a regulatory crisis. A better solution would be a mechanism that did not forbid gearing from rising "too high" but, rather, made it financial unattractive *deliberately* to raise it so high.

(b) It is attractive to allow firms to set their own efficient financing levels. Thus, any cap or penalty regime should not apply immediately above what the regulator regards as the optimal level of gearing but, rather, should begin to apply only at some margin above this point — leaving the firms some measure of optimising discretion.

(c) The losses from making a penalty regime too strict are relatively mild. The result would merely be that gearing would be lower than optimal, and a natural expectation arising from the Modigliani-Miller theorem is that that there will be a fairly flat zone for the cost of capital. So if there are inefficiencies from gearing being reduced, we should expect such inefficiencies to be relatively small.

(d) The above points suggest it would be useful to have some tapering mechanism whereby if NATS increases gearing above some threshold defined according to principle (b) it would experience a penalty for doing so. We should distinguish between two elements here. First, there is (under current UK tax rules) a tax benefit from increasing gearing. Second, if bonds are thought by the market more likely to be bailed out than equity, then as gearing rises such that the risk of default (and hence the risk of calling on bailout promises) rises, there is a rise in the value of the enterprise. The penalty regime needs to take account of both of these effects. It is thus useful to calculate the tax benefit from increasing gearing and estimate the enterprise value gain from over-gearing in the presence of bailout promises.

4.48 Section 3 provided modelling results illustrating the potential size of adjustments that might be needed to remove the benefits from gearing up resulting from the tax shield on debt and the possibility of bailout. More detail on the tax issues was provided earlier in this section (see discussion on “Clawback of tax benefits”).

4.49 If the CAA introduces a mechanism along the lines we recommend above, it would be important not to present it in a way which implied that a bailout was likely in the event of financial distress, since this would exacerbate the very problem that the mechanism would be aiming to address.

Other Financial Licence Conditions

4.50 Other regulators have used a range of mechanisms to regulate finance, as summarised in appendix 3. These include:

(a) Financial ring-fencing;

(b) A requirement to maintain an investment-grade credit rating with a cash-lock up condition where the company fails to do so;

(c) Adjustments within price controls to claw back the tax benefits from high levels of gearing;

(d) A requirement to maintain a cash reserve to act as an equity buffer;

(e) Transparency requirements.

4.51 These approaches are not mutually exclusive.

4.52 We consider that financial ring-fencing, requiring an investment grade credit rating with cash-lock up provisions, and appropriate transparency requirements are all sensible regulatory precautions to seek to protect customers' interests.

4.53 In appendix 2, we have summarised some of the main conditions in NATS' licence relating to financial issues. While a detailed review of the provisions in NATS' licence conditions is outside the scope of this project, we note that:

(a) NATS is already required to use all reasonable endeavours to maintain an investment grade credit rating.

(b) NATS already has a number of obligations relating to transparency, such as the requirement to produce regulatory accounts.

(c) Although there are some restrictions on the circumstances in which NATS can pay out dividends, the CAA might wish to review whether stronger cash-lock up provisions could be used to address circumstances in which there are indications that NATS financial position has deteriorated (e.g. its credit rating has fallen below investment grade).

5 CONCLUSIONS

5.1 This paper has explored options for regulating NATS finances for CP3, given the perception that the CAA cannot credibly commit not to "bail out" NATS in the event that it gets into financial distress.

5.2 There are three factors that may give NATS an incentive to over-gear, namely:

(a) The tax advantages of debt finance;

(b) A reduction in systematic risk and hence the asset beta from gearing up, because of the greater likelihood that downside shocks will be borne by customers and/or taxpayers through a bailout;

(c) The increase in expected cashflows from gearing up, due to the higher probability of financial distress occurring and a bailout being provided.

5.3 In this paper, we have presented modelling results which illustrate the possible magnitude of these effects. While the benefits of the tax shield on debt and expected cashflows from bailout are both substantial, the asset beta effect was found to be negligible in practice.

5.4 There are several different approaches which could be used to address these issues. In this paper we have considered a number of these policy options.

5.5 To the extent possible, we would advise that the special administration regime is strengthened to make it more credible and robust. However, we recognise that such changes would require the involvement of government.

5.6 Within the price control and licence framework, we would suggest that both the concepts of a prohibition on average gearing exceeding a threshold (with point gearing not permitted to exceed a slightly higher threshold) and the concept of using a punitive mechanism to deter gearing could be made to work to achieve the CAA's objectives.

APPENDIX 1: CURRENT SPECIAL ADMINISTRATION REGIME

A1.1 The special administration regime for air traffic services is detailed in the Transport Act 2000.[13] Key features of the regime are summarised below.

A1.2 If an application is made to any court for the winding up of a licence company and the court is satisfied that it would be appropriate to make a winding up order if the company were not a licence company, it must instead make an air traffic administration order.

A1.3 The court may make an air traffic administration order in relation to a licence company if:

(a) an application by petition is made by the Secretary of State or by the CAA with his consent, and

(b) the court is satisfied that one or more certain conditions is satisfied, which include that the company is or is likely to be unable to pay its debts or there has been or is likely to be a contravention by the company of a duty.

A1.4 An air traffic administration order is an order directing that in the period while the order is in force the company's affairs, business and property are to be managed by a person appointed by the court. The person's purposes are detailed below, but these must be pursued in a manner which protects the interests of the company's members and creditors.

A1.5 The first purpose specified is as follows:

> (a) the transfer to another company, as a going concern, of so much of the licence company's undertaking as it is necessary to transfer to ensure that its licensed activities may be properly carried out, or
>
> (b) the transfer to different companies of different parts of the licence company's undertaking, as going concerns, where the parts together constitute so much of its undertaking as is described in paragraph (a).

A1.6 The second purpose is:

> the carrying on, pending the transfer, of the licence company's licensed activities.

Financial Assistance

A1.7 If an air traffic administration order is in force in relation to a company the Secretary of State may:

[13] http://www.uk-legislation.hmso.gov.uk/acts/acts2000/pdf/ukpga_20000038_en.pdf

> (a) make grants or loans to the company of such sums as he thinks appropriate to facilitate the achievement of the order's purposes;
>
> (b) agree to indemnify the air traffic administrator in respect of liabilities incurred and loss or damage sustained by him in connection with carrying out his functions under the order.

A1.8 The Secretary of State may guarantee the repayment of the principal amount, the interest and the discharge of any other financial obligation borrowed by a company relating to an air traffic administration order.

A1.9 The terms of such a grant may require all or part of it to be repaid to the Secretary of State if there is a contravention of the other terms on which it is made.

A1.10 A grant, loan, agreement to indemnify, guarantee or direction requires the Treasury's consent. There are also requirements for informing each House of Parliament.

APPENDIX 2: FINANCIAL CONDITIONS IN NATS LICENCE

A2.1 This appendix summarises key aspects of condition 5 in NATS' licence, which relates to availability of resources and financial ring-fencing.

A2.2 In addition, condition 6 (not discussed below) imposes regulatory accounting requirements on NATS.

Availability of resources

5.7 NATS must at all times act in a manner that should secure the availability of resources for the purposes of fulfilling its obligations under the Licence and the Transport Act 2000.[14] NATS must submit a certificate to the CAA, no latter than three months from the end of each financial year, using one of three formulas (summarised) to state:[15]

(a) That the directors reasonably expect that NATS will have sufficient resources to complete its obligations;

(b) That the directors reasonably expect that NATS will have sufficient resources to complete its obligations, but some issues, which must be presented in the certificate, may cast doubt on this; or

(c) That the directors reasonably expect that NATS will not have sufficient resources to complete its obligations.

A2.3 NATS must include a report by its auditors.[16] If any information arises that would cast doubt on this reasonable expectation, then the directors must immediately inform the CAA.[17]

A2.4 Any dividend distribution must be preceded by submission of a certificate to the CAA that such a distribution would not, either by itself or with other circumstances, cause NATS to be in breach of certain conditions in its licence.[18]

Restriction on activity and financial ring-fencing

A2.5 Neither NATS nor any related undertaking should undertake any other business activities than those permitted by the licence.[19]

A2.6 NATS cannot acquire shares in another company without the express consent of the CAA, unless:[20]

[14] Condition 5, Clause 2.
[15] Condition 5, Clause 3.
[16] Condition 5, Clause 6.
[17] Condition 5, Clause 5.
[18] Condition 5 , Clause 8.
[19] Condition 5, Clause 9.

(a) It is a company in which it already owned shares prior to the licence;

(b) The shares are acquired to avoid dilution of NATS' shareholding; or

(c) The shares are bought in a body corporate that conducts En Route (UK) or En Route (Oceanic) business or other permitted purposes.

A2.7 The licence states that these provisions shall not prevent NATS from conducting business that complies with, among other conditions, a maximum limit of 3 per cent on the aggregate of NATS' other business and related companies' business with respect to the turnover of the En Route businesses in any financial year.[21]

A2.8 Furthermore, the aggregate described above should not exceed 1 per cent of its share of capital in issue, share premium or reserves with respect to NATS' latest financial accounts.[22]

Disposal of relevant assets and indebtedness

Disposal of Assets

A2.9 When either disposing of an interest or relinquishing operational control of an asset, NATS must give the CAA written notice 3 months prior to the disposal and any other information reasonably expected or requested by the CAA.[23] NATS may proceed with the disposal once the CAA has granted written consent or alternatively, not objected within a specified timeframe.[24] The CAA may however grant general consent to a class of items for which NATS would no longer have to comply with this requirement.[25]

Indebtedness

A2.10 NATS may not take any mortgage, security or debt other than:[26]

(a) At arm's length (where both party is operating subject only to their own self-interest);

(b) On normal commercial terms; or

(c) For any permitted business activities;

that create a material increase in risk, taken alone or with any other circumstances.

---

[20] Condition 5, Clause 10.
[21] Condition 5, Clause 12(a)(v).
[22] Condition 5, Clause 13.
[23] Condition 5, Clause 16.
[24] Condition 5, Clause 18.
[25] Condition 5, Clause 17(a).
[26] Condition 5, Clause 19(a).

A2.11 NATS may not lend anything to an affiliate or related business other than by:[27]

(a) Distribution of dividend(s);

(b) Repayment of capital;

(c) Payment due on standard commercial terms or arm's length basis for goods and services;

(d) Any transfer, loan, lease or licence on standard commercial terms;

(e) Repayment of interest on loan;

(f) Payment of group corporation tax relief; or

(g) An acquisition of shares compliant with the aforementioned provisions;

that create a material increase in risk, taken alone or with any other prevailing circumstances.

A2.12 Any agreement between NATS and an affiliate must be made either at arm's length or on standard commercial terms.

A2.13 NATS is prohibited from entering any credit-default obligations (obligations that are accelerated or increased with an increased risk of default) unless with prior consent from the CAA which need not be renewed for any extension.

Ultimate holding company

A2.14 NATS must receive a legally enforceable promise from its ultimate holding company that it will:[28]

(a) Refrain itself and any subsidiary from any action which would be likely to cause NATS to breach its obligations under the licence. (The word 'likely' means the court will assess the issue objectively given the information available at the time.)

(b) Provide any information to the CAA upon request.

A2.15 A copy of the legally enforceable promise should be sent to the CAA within a specified timeframe and inform the CAA of any changes in this legal relationship.[29]

[27] Condition 5, Clause 19(b).
[28] Condition 5, Clause 21.
[29] Condition 5, Clause 21.

NATS' credit rating

A2.16 NATS must at all times maintain an investment grade credit rating.

Upon default or other events

A2.17 Upon default, NATS shall notify the CAA in writing, unless the default is of a technical, administrative of minor nature and capable of immediate remedy.[30] NATS must provide any information as requested by the CAA in the event of default.[31]

A2.18 NATS must notify the CAA on any trigger event as stipulated in the Finance Documents[32] (these documents determine how NATS' senior debt is managed[33]).

A2.19 NATS must notify CAA of any likely increase in the ratio of net debt to regulatory asset based ratio contained in the Financial Documents, which is:

(a) Material;

(b) Likely to continue or have an effect lasting more than 6 months; and

(c) Forecasted to occur in the next 5 years.

A2.20 NATS must notify the CAA if the credit rating agency is considering lowering NATS' credit rating.[34]

[30] Condition 5, Clause 14(c).
[31] Condition 5, Clause 14(f)(ii).
[32] Condition 5, Clause 14(d).
[33] Condition 5, Interpretation under Clause 4.
[34] Condition 5, Clause 14(i).

APPENDIX 3: APPROACHES TO REGULATING FINANCE USED BY OTHER REGULATORS

Introduction

A3.1 This appendix considers some of the approaches to regulating finance that have been used by other utility regulators.

A3.2 Many regulated entities chose to increase their leveraging during the 1980s and 1990s. Ofwat and Ofgem have been particularly active in addressing the issues surrounding leveraging in regulated entities. Ofgem has not needed to be as active, as the telecoms market has chosen to deleverage since the early 2000s due to market developments.

Ring-fencing

A3.3 Licence conditions are used to create a regulatory barrier between the regulated entity and its holding company.

A3.4 Such arrangements can include:

(d) separate financial assessments;

(e) requirements for the regulated entity to have sufficient resources to carry out its activities;

(f) restrictions on the transfer of assets;

(g) the provision of additional information from associated companies;

(h) prohibition on loans between companies (unless authorised); and

(i) prohibition on cross default arrangements (unless authorised).

A3.5 The purpose of such ring-fencing is to diminish, if not eliminate, the transfer of risk from the holding company and/or associate companies to the regulated entity.

A3.6 An example of where such ring-fencing arrangements have worked well is the collapse of Enron, the ultimate holdings company for Wessex Water and Aquila Energy Partners Holdings. These latter firms were sold as going concerns and were able to gain access to capital markets and thus remained fully financed, despite the collapse of their parent company.

Credit ratings and cash lock-up clauses

A3.7 A regulator can also insert a clause that states either an absolute obligation to maintain a regulated entity's issued debt rating above a certain investment grade credit rating or alternatively a weaker obligation to use all reasonable endeavours to maintain the issued debt rating above the investment grade credit rating.

A3.8 Cash lock-up clauses are activated when a regulating firm's debt rating falls below the prescribed rating or is threatened by a downgrade (conditions may vary by licence). Once activated, a prohibition is placed on the transfer of cash or other assets to any associated company. This serves to stop a sudden flight of capital due to a downgrade, or the threat of one, leading to the default of a regulated entity.

A3.9 A caveat to this approach is that ratings agencies are given substantial power in the regulatory framework, becoming quasi-regulators.

A3.10 Ofwat and Ofgem have both applied these approaches but to differing degrees. In the energy sector, all companies must retain an investment grade credit rating and are prevented from engaging in non-core activities. In the water industry, although firms must all retain an investment grade credit rating, only one is prohibited from engaging in non-core activities.[35]

Reassess cost of capital in price controls

A3.11 Debt and equity are treated differently for tax purposes. Interests payments on debt are deductible expenditures while dividends paid to shareholders are not. As such, two firms of the same value but differing only in the financing (i.e. one at 100 per cent equity and the other at 100 per cent debt) will have different tax liabilities. The firm financed wholly by debt will be the most tax efficient.

A3.12 Some regulators have addressed the tax incentives to gear up by clawing back tax savings from gearing up above the notional gearing level assumed in setting the WACC.

A3.13 For instance, in calculating allowances for tax liabilities, Ofwat uses the notional level of gearing for companies with gearing below the notional level, but actual gearing for companies with higher gearing (thus passing the tax savings of higher gearing through to customers).

A3.14 Further, in its methodology paper for PR09 Ofwat also explained that it would claw back the tax benefits from any refinancing during the price control period at the next review:[36]

> "For the 2014 review, we will claw back on a net present value (NPV) netural basis the tax benefits resulting from a company gearing up during the 2010-15 price review period where:
>
> — there is a one-off step change in gearing resulting from a financial restructuring; and
>
> — subject to passing the above test, interest costs in any subsequent year within the price review period exceed those assumed in setting price limits.

[35] OFWAT & OFGEM (February 2006) "Financing Networks: a discussion paper" p.20
[36] Ofwat (March 2008), "Setting price limits for 2010-15: Framework and approach"

> The trigger will capture increases in gearing that result from refinancing or a return of capital to shareholders."

Reserve requirements

A3.15 Reserve requirements are used in case financial problems are encountered and are set by the regulator on either a market wide or ad hoc basis. Ofwat permitted Glas to acquire Dwr Cymru at a reduced price so that it could use the additional funds as an equity buffer in turbulent financial times.[37]

Increased transparency

A3.16 Many smaller measures fall under this category, such as:

(a) A regulator may impose the requirement that a firm comply with publishing requirements of the London Stock Exchange, as Ofwat did with Dwr Cymru;

(b) A regulator may impose further conduct rules such as abiding by the UK Listing Authority's rules on principles of good governance, again as Ofwat did with Dwr Cymru; and

(c) A regulator may make public statements about how it believes an entity in that market should structure its finance. The markets may use this as a useful barometer against which to assess the entity's chosen financial structure.

A3.17 Increased transparency permits financial markets to evaluate better the entity's assets. Aware of this, directors are arguably under greater pressure not to take on excessive levels of debt.

Do nothing: self-regulation

A3.18 Alternatively, a regulator can choose to do nothing, especially if the market seems to choose modest levels of gearing. Ofcom has not needed to impose any of the above restrictions on financing in the telecom industry, since in the early 2000s many telecom providers began deleveraging out of fear of the effects of overleveraging. Ofcom considers that it only needs to monitor the situation as it believes that companies have responded to movements in the financial markets and, as such, have dealt with the overleveraging problem themselves.

[37] Department of Trade and Industry (October 2004) 'The Drivers and Public Policy Consequences of Increased Gearing" p.35