

## PRIVATE HEALTHCARE MARKET INVESTIGATION

### Cost of Capital: planned methodology

#### Introduction and summary

##### *Purpose of the working paper*

1. The purpose of this working paper is to set out the Competition Commission's (CC's) proposed approach, together with our reasoning, to calculating the cost of capital for the seven largest private hospital operators (the "Private Hospital operators").<sup>1</sup> Comments on this paper should be submitted no later than 5 pm on 26 November 2012.
2. This working paper should be read in conjunction with the private hospital profitability methodology working paper published by the CC on 7 November 2012.

##### *Structure of the working paper*

3. The table below sets out the structure of this working paper and provides a brief description of the content of each section.

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<sup>1</sup> These are: BMI, BUPA Cromwell, HCA, Nuffield, Ramsay, Spire and The London Clinic. We note that there may be private hospital groups in the UK that are larger in revenue terms than those listed here but which have a focus on mental health, cosmetic surgery, fertility, maternity or other areas of healthcare.

TABLE 1 **Structure of the paper**

<i>Title</i>	<i>Purpose</i>	<i>Paragraphs</i>
Introduction and summary	To state the purpose of this paper. To summarize our planned treatment of certain inputs to the cost of capital calculation.	1 to 4
Background	To explain how the cost of capital fits into a profitability analysis.	5 to 7
Framework for estimating the cost of capital	To provide a brief overview of the capital asset pricing model framework used to estimate the cost of capital.	8 to 11
Specification of parameters of the weighted average cost of capital/capital asset pricing model	To state the: <ul style="list-style-type: none"> <li>• relevant geographic market;</li> <li>• relevant time period; and</li> <li>• basis of the financial information used in the analysis.</li> </ul>	12 to 15
Principles of our analysis	To set out the principles that we propose to apply in carrying out our analysis.	16 to 21
Specification of the components of the weighted average cost of capital	To define for the purposes of the weighted average cost of capital calculation the following inputs: <ul style="list-style-type: none"> <li>• risk-free rate;</li> <li>• equity risk premium;</li> <li>• beta values;</li> <li>• gearing;</li> <li>• cost of debt;</li> <li>• tax rate; and</li> <li>• size premium.</li> </ul>	22 to 40

### ***Summary of planned treatments***

4. The table below summarizes our proposed approach to estimating the main parameters of the weighted average cost of capital (WACC).

TABLE 2 **Summary of planned treatments**

<i>Parameter</i>	<i>Proposed treatment</i>	<i>Paragraphs</i>
Risk-free rate	To use the average redemption yield on index-linked UK gilts adjusted for actual inflation over the period.	23 to 24
Equity risk premium	To estimate the long-term average UK equity risk premium over the period.	25 to 26
Equity beta values	To estimate equity betas on the basis of the equity betas of listed comparable companies.	27 to 30
Debt beta values	To calculate the WACC using an assumption of a zero debt beta.	31
Gearing	To apply a typical or average level of gearing for the industry.	32 to 36
Cost of debt	To use the nominal redemption yield on corporate bonds of an appropriate credit rating, consistent with the assumed gearing.	37 to 38
Effective tax rate	To use the UK corporate tax rate for the period.	39
Size premium	To apply no size premium to the cost of equity.	1 to 40

## Background

5. This working paper takes as its starting point the references to profitability assessment in the Draft Guidelines for Market Investigations published for consultation on 15 June 2012 (the Draft Guidelines<sup>2</sup>).<sup>3</sup>

6. The Draft Guidelines note that:

Profitability can be a useful indicator of competitive conditions in a market. An efficient firm in a competitive market would generally be able to earn no more than a ‘normal’ rate of profit—the minimum level of profits required to keep the factors of production in their current use in the long run, ie its rate of return on invested capital for a particular business activity would be equal to its **cost of capital** for that activity.<sup>4</sup>

7. The profitability methodology paper sets out our proposed approach to estimating the return on capital achieved by the Private Hospital operators. In order to determine

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<sup>2</sup> [www.competition-commission.org.uk/publications/consultations-open/cc-review-of-market-investigation-references-guidelines](http://www.competition-commission.org.uk/publications/consultations-open/cc-review-of-market-investigation-references-guidelines).

<sup>3</sup> [www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep\\_pub/rules\\_and\\_guide/pdf/cc3.pdf](http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/rules_and_guide/pdf/cc3.pdf).

We note that there is no material difference between the current Guidelines and the Draft Guidelines as regards the stated purposes of and approach to profitability analysis.

<sup>4</sup> Draft Guidelines, paragraph 118. Emphasis added.

whether the levels of profitability are excessive, however, the rates of return need to be compared with an appropriate cost of capital for the industry.

### **Framework for estimating the cost of capital**

8. The Draft Guidelines state that: 'The CC will generally look to the capital asset pricing model (CAPM) when considering the cost of capital, since this is a widely understood technique with strong theoretical foundations.'<sup>5</sup>

9. The CAPM can be used to calculate the cost of equity. It relates the cost of equity  $E[R_i]$  to the risk free rate ( $R_{rf}$ ), the expected return on the market portfolio ( $R_m$ ), and a firm-specific measure of investors' exposure to systematic risk (beta or  $\beta$ ) as follows:

$$E[R_i] = R_{rf} + \beta(R_m - R_{rf})$$

10. If a business were entirely funded by equity, the expected return on equity could be considered to be its 'cost of capital'. However, most firms are funded by a combination of both debt and equity, such that the appropriate cost of capital to consider is the weighted average cost of debt and equity. The WACC is given by the following expression:

$$WACC = E[R_i] \times E/(D+E) + K_d \times D/(D+E)^6$$

11. Finally, the cost of capital must take into account the effects of tax on returns to capital providers. The returns to debt holders take the form of interest payments which are usually tax-deductible. The returns to equity holders (dividends), on the other hand, are taxed. Hence, where the cost of capital is expressed 'pre-tax', the cost of equity used must reflect the fact that the actual return to shareholders will be reduced by the rate of tax.

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<sup>5</sup> Draft Guidelines, Annex A, paragraph 15. See Brealey & Myers, 'Principles of Corporate Finance', chapters 8 & 9 for a detailed exposition of the CAPM.

<sup>6</sup> Where D is debt, E is equity and  $K_d$  is the cost of debt.

## **Specification of the parameters of the WACC**

12. There are a number of issues that we need to consider prior to undertaking the WACC calculation in order to ensure that it is an appropriate benchmark for the return on capital calculations carried out on the Private Hospital operators. These include:

- the relevant geographic market;<sup>7</sup>
- the relevant time period; and
- the basis of the financial information, ie whether real or nominal.

### ***The relevant geographic market***

13. A business' cost of capital is determined by the financial and economic conditions of the market(s) in which it operates. In order to reflect the geographic scope of the OFT's reference in the profitability analysis, the CC will look to estimate the cost of capital of a stand-alone<sup>8</sup> private hospital operator that is only active in the UK (see paragraph 17).

### ***The relevant time period***

14. As set out in the profitability methodology working paper, we plan to analyse the Private Hospital operators' profitability for the five financial years ending between 1 January 2007 and 30 June 2012. Hence, the WACC should also be estimated for the period between 1 January 2007 and 30 June 2012 to ensure consistency.

### ***The basis of the financial information***

15. We propose to estimate the cost of capital on a nominal pre-tax basis. This avoids the need to adjust nominal financial information to remove the effects of inflation.

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<sup>7</sup> Note that "relevant market" as used in this paper does not refer to the economic relevant market for market definition purposes.

<sup>8</sup> ie a private hospital operator with no other lines of business.

## **Principles for cost of capital analysis**

16. As set out in paragraph 7, we are calculating the cost of capital for the Private Hospital operators in order to have a benchmark against which to compare the returns made in the industry. This section sets out the basic principles guiding our analysis.

### ***Stand-alone UK acute private hospital business***

17. Whilst some of the Private Hospital operators are only active in the provision of acute private healthcare services, a number of them are part of larger groups that operate private hospitals in other countries and/or are active in different product markets in the UK. For example, Nuffield operates a number of fitness centres. Since the profitability analysis is focused only on the UK acute private hospital activities of these businesses, the cost of capital should reflect the costs and risks associated with these same activities and may differ from the cost of capital of the groups as a whole. We use the term 'stand-alone UK acute private hospital business' to reflect this focus.

### ***Average for the period***

18. The profitability analysis is being carried out over the five financial years ending between 1 January 2007 and 30 June 2012. Given this time frame for the analysis, we plan to estimate a single or average cost of capital for the whole period rather than a number of annual estimates. We recognize that the recent financial crisis and the response of authorities, such as the Bank of England, may have caused volatility in the inputs used to estimate the cost of capital over time and we will take this into account in interpreting the results of our analysis. A single capital structure and cost of capital for the industry.

19. The choice of capital structure (ie the level of debt and equity) for a firm does not affect the overall returns it generates for its debt and equity holders but only the distribution of the returns to those parties. Overall returns are determined by the financial performance of the business, that is, by how successful the business is in using its assets to generate profits.
20. On the other hand, the weighted average cost of capital may be affected by choices over the capital structure.<sup>9</sup> The information provided to us in response to the financial questionnaire (FQ) indicates that the firms active in the UK private hospital sector have chosen a range of capital structures. Whilst this variation will produce different costs of capital for each firm, we require a benchmark against which to assess the profitability of the industry as a whole. Therefore, we plan to estimate a 'typical' capital structure for the industry and use this as the basis of our WACC calculation.<sup>10</sup> Similarly, we believe that the firms in the industry will face the same systematic risks, such that a single beta estimate (or narrow range of estimates) will be appropriate for all the Private Hospital operators.

### **Specification of the components of the WACC**

21. As set out in paragraph 10, the formula for the WACC is composed of a number of elements which need to be specified. In this section, we set out the approach that we plan to take in estimating each of these components.

#### ***Risk-free rate***

22. The risk-free rate provides a measure of the return that can be expected by an investor without accepting any risk on an investment. It is usually proxied by the redemption yield on index-linked government bonds (government bonds are also

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<sup>9</sup> See Principles of Corporate Finance, Brealey and Myers.

<sup>10</sup> See paragraphs 32 to 36 on gearing for a discussion of how this normalized capital structure will be estimated.

referred to as gilts) as these are regarded as having negligible default and inflation risk. We propose to use the return on index-linked UK gilts with maturities of between 5 and 20 years, adjusted for actual inflation in each year over the period<sup>11</sup>, as a measure of the (nominal) risk-free rate.

23. We believe that it is appropriate to average the return on these gilts over the relevant period in light of the significant movements that have taken place in interest rates over the period due to the financial crisis.

### ***Equity risk premium***

24. The equity risk premium (ERP) is the difference between the return provided by the market as a whole and the risk-free rate. There are two main approaches to estimating the market return and the ERP: historical data reflecting actual returns over time; and forward looking data relating to investors' expectations of returns.
25. We will estimate the ERP based on both approaches and including estimates from Dimson, Marsh and Staunton<sup>12</sup> (DMS). DMS have measured the ERPs achieved by a number of stock markets worldwide over extensive periods of time.

### ***Beta values***

26. The beta value used in calculating the cost of equity measures the riskiness of the returns on the stock being analysed relative to the rest of the market. For a listed entity, this is equal to the covariance between the stock's returns and the market's returns, divided by the variance of market returns.

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<sup>11</sup> We propose to use expected yields on index-linked gilts rather than conventional gilts as the yields on the latter include inflation risk and so cannot be said to be risk-free. However, since we are using nominal profits in all our analysis, these yields will need to be adjusted for actual inflation.

<sup>12</sup> Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2012.



27. When a firm is not listed, however, its beta value cannot be measured directly but can be estimated based on the betas of comparable companies.
28. In estimating an appropriate beta value (or range of beta values) for the Private Hospital operators, we will have reference to:
- the actual beta values of the listed parent companies of the Private Hospital operators, where available, notably those of BMI, HCA and Ramsay; and
  - the beta values of listed comparable companies in the UK and overseas.
29. In response to the FQ, some of the hospital groups have provided us with details of firms they consider to be comparable for these purposes. We will review and refine this list in order to come to a view on an appropriate set of comparable companies.
30. We propose to apply a debt beta of zero in calculating the cost of capital. This reflects our assumption that under a typical capital structure, there is no variability in the returns to debt-holders.

### ***Gearing***

31. As set out in paragraphs 20 and 21, we wish to estimate a single cost of capital for the period, which should reflect a typical level of gearing for a stand-alone private hospital operator in the UK. In response to the FQ, the private hospital operators have provided information on their actual capital structures over the relevant period. However, we do not believe that these values—or an average thereof—are appropriate for our analysis for three main reasons.
32. First, these capital structures show the debt and equity held by the businesses at their book values rather than their market values. Although for debt these two values

are unlikely to diverge significantly, except in the case of financial distress, there can be significant differences between the two for equity.

33. The second issue is that a number of the private hospitals are subsidiaries of or business units within larger groups, which are funded at the aggregate level. This capital structure may not, therefore, reflect a typical structure for a stand-alone private hospital business in the UK.
34. The third issue is that a number of the private hospital operators raised debt finance shortly prior to the financial crisis, achieving gearing ratios significantly in excess of those that could have been achieved since 2008. Hence, these levels of gearing are not representative of the period as a whole.
35. Therefore, we plan to estimate a typical capital structure for the industry on the basis of the capital structures of comparable listed companies, where the equity is traded and hence a market value is available.<sup>13</sup> We will have regard to the average gearing ratios of these companies over the relevant time period.

### ***Cost of debt***

36. In estimating a cost of capital for the industry, it is important to maintain consistency between the capital structure and the cost of debt used. In light of our proposed approach to estimating a 'typical' capital structure, we plan to estimate the cost of debt for the Private Hospital operators on the basis of UK corporate bond yields over the relevant period.
37. In determining the relevant group of corporate bonds for our analysis, ie the appropriate credit rating, we will take into account both the gearing ratio to be used in

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<sup>13</sup> The same comparable companies will be used to estimate both the beta values and the normalized capital structure to be used in the WACC calculation.

the WACC calculation and the credit ratings of any publicly-traded debt of the set of comparable companies. We will compare these corporate bond yields with the interest rates paid by the Private Hospital operators over the same period as a cross-check to our analysis.

### ***Tax rate***

38. As discussed in paragraph 15, we plan to calculate the cost of capital on a nominal, pre-tax basis. The tax rate used for this calculation will be the (average) prevailing rate of corporation tax in the UK over the relevant period.

### ***Size premium***

39. In response to the FQ some of the Private Hospital operators suggested that it would be appropriate to include a size premium in their cost of capital in order to reflect the higher returns required by investors for holding smaller stocks. Following an initial review of some of the academic literature, our current view is that both the theoretical underpinnings and the empirical evidence for a size premium on smaller firms is inconclusive. Therefore, we do not propose to include a size premium in our cost of capital calculations.