

# Ofcom's approach to risk in the assessment of the cost of capital

Second consultation in relation to BT's equity beta

BT's response to the Ofcom consultation document published 23rd June 2005

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BT would welcome comments on this response. Comments should be addressed by e-mail to Michael Doodson at michael.doodson@bt.com

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#### A. Executive Summary

BT believes that the evidence Ofcom has presented does not support a significant reduction to BT's overall equity beta compared with the rate used by Ofcom in September 2004. Any suggestion that the fundamentals that drive BT's equity beta could have changed materially in such a short space of time appears to be implausible. In addition, the evidence presented in support of Ofcom's belief that copper access is less risky, and that it should therefore have a lower cost of capital, is in our view somewhat weak and inconclusive. Notwithstanding the weakness of the evidence, we believe that disaggregation into two parts is preferable to the three-way split previously suggested by Ofcom. The evidence presented by Ofcom does not support any particular rate for the equity beta for copper access, and so any difference imposed by Ofcom should be small.

This response sets out BT's views on these issues in more detail, and explains BT's belief that the appropriate values for betas and consequently cost of capital rates are as follows:

- BT's overall equity beta: at least 1.25.
- BT's overall cost of capital: in the range 11.6% to 12.2%
- Copper access equity beta: at least 1.1
- Copper access cost of capital: in the range 10.9% to 11.4%
- Cost of capital for the rest of BT: in the range 12.1% to 13.3%

#### B. General response to Ofcom's proposals

#### Summary of Ofcom's proposals

It is useful to put our responses into context by summarising the key proposals that Ofcom makes in this consultation are:

- BT's overall equity beta has declined from the 1.3 used by Ofcom in September 2004<sup>1</sup> to between 1.0 to 1.2 based on a range of evidence.
- Ofcom remains of the view that a limited "beta disaggregation" is appropriate, with a copper access beta between 0.1 and 0.3 below the group beta.

<sup>&</sup>lt;sup>1</sup> Ofcom assessed BT's overall cost of capital as part of their review of Partial Private Circuits price controls. The final statement was published in September 2004 - see

http://www.ofcom.org.uk/consult/condocs/ppc\_charge\_control/statement/ppc\_stmnt.pdf. Annex D of that document sets out Ofcom's conclusions on BT's overall cost of capital.

- Taking midpoints of these ranges, Ofcom suggests the equity beta<sup>2</sup> for the copper access network should be set at 0.9, reflecting what Ofcom considers to be lower risk in those activities that use the copper access network.
- The equity beta for the rest of BT's activities should be set at 1.23, being the balancing figure using the mean capital employed of the relevant parts of BT to weight their contribution to BT's weighted cost of capital.
- The forward-looking nominal risk free rate should be set at 4.7%.
- The forward-looking equity risk premium should be set at 4.5%.

Combining the effects of the individual estimates, Ofcom is now suggesting that BT Group's overall cost of capital should be 11.0%<sup>3</sup> on a pre-tax nominal basis<sup>4</sup>. This rate is considerably lower than the rate used in the last Network Charge Control (13.5% - determined in 2001) and the Partial Private Circuit control (13.0% - determined as recently as September 2004). The effect of the "beta disaggregation" is then that Ofcom suggests that the cost of capital for the copper access network should be set at 10.1%, and for the rest of BT at 11.5%.

#### **BT's views**

The following sections set out BT's views, and the logic of BT's arguments in support of its conclusions.

This consultation proposes to re-set the allowed rate of return on capital employed. This allowed rate is used in both formal price controls (such as the Network Charge Control and Partial Private Circuits price control) and in determining the appropriate return on capital employed that should be recovered in prices for regulated products either determined by Ofcom or proposed by BT. The allowed rate of return is also used as a benchmark in investigations by Ofcom under the Competition Act into pricing of non-regulated products.

Any mis-judgement in determining the cost of capital for either BT as a whole or for parts of the group could have significant adverse impacts on BT's incentive to invest and on the returns reasonably expected by BT's shareholders. It is therefore critical that Ofcom acts in an objective manner, basing its conclusions on factual evidence, where available. In the absence of objective evidence Ofcom must exercise its judgement in a way that properly reflects its responsibilities to investors as well as customers. In addition, where there are a range of values that could be adopted for parameters used in the calculation of BT's cost of capital, it would be preferable for Ofcom to recognise the uncertainty, and to err on the upside - the consequences of setting the cost of capital too low have potentially wide-reaching impacts on the development of telecommunications services in the UK.

It is also important that any conclusions reached are implemented by Ofcom in a way that increases certainty for investors, competitors and BT itself, and aids stability in the development of the UK telecommunications market. Frequent revision of key inputs to the regulatory regime such as cost of capital should be avoided, and since the fundamentals of BT do not change rapidly it would be appropriate to review the cost of capital only infrequently - perhaps only once every four or five years.

<sup>&</sup>lt;sup>2</sup> Note that as only BT Group issues equity shares any reference to "equity beta" for anything other than BT as a whole is notional only. For simplicity we refer to this notional concept as if it was actual equity beta.

 <sup>&</sup>lt;sup>3</sup> This figure is not quoted in the consultation document, but can be calculated from the data given.
<sup>4</sup> All subsequent references to the cost of capital are given on a pre-tax nominal basis, except where explicitly identified as being on a different basis.

#### The appropriate value for BT's overall equity beta is at least 1.25

The evidence relating to BT's overall equity beta does not justify a material reduction from the 1.3 determined by Ofcom as recently as September 2004. The data presented by the Brattle Group in their Figure 2 clearly indicates a continuous period of stability in the beta estimates calculated using two years of daily data.

There is no explanation given either by Ofcom or the Brattle Group as to why, in the period since February 2005, the two year estimate of BT's equity beta has fallen so dramatically from its previous stable level. We show in this response that this is likely to be due to peculiarities of the data, which means that estimation techniques used by the Brattle Group have severe shortcomings. The apparent changes appear not to be due to a sudden shift in BT's underlying business risk. Without any rationale to explain why there has been a fundamental alteration to the relevant risk for BT, we believe that Ofcom should not put emphasis on a single measure for estimating beta derived using the abnormal data for few months since February 2005 onwards. An illustration of the hazard in using this data is given by the fact that estimates using this very recent data also show a significant *increase* in beta on another measure (six months of daily data).

We have re-presented Figure 2 from the Brattle Group paper on page 7 of this response, with a horizontal line added at a beta of 1.25. Whilst this might not be a wholly "scientific" approach, it could reasonably be argued that, using two year daily data, there is a stable value that persists over several years, and that this value is around 1.25. The large body of further statistical analysis is useful background to this conclusion, but it is easy to get caught up with the mechanical results, and what really matters here is whether Ofcom's judgement matches what common sense tells us. Common sense strongly supports our conclusion that BT's underlying beta cannot have materially changed since Ofcom determined it at 1.3 only in September 2004, and that the appropriate value to use for BT's forward-looking equity beta is at least 1.25.

### The beta for the copper access business should be at least as high as the stock market as a whole

We welcome Ofcom's judgement that it would be inappropriate to attempt to disaggregate BT's cost of capital into three or more risk categories (para 4.55), but we remain concerned at the extent of the differentiation that Ofcom suggests.

BT accepts that there are some *a priori* grounds for suggesting that copper access may have lower risk than the riskiest parts of BT. However, the direct evidence for this, and the evidence on which to base a numerical estimate, is not convincing. For example, the paper by PwC regarding different beta values for different parts of BT gives little more than general directional support for a higher beta for BT's ICT (information and communication technology) activities, and even this conclusion is based on limited and uncertain evidence. In addition, PwC's analysis is based on ICT accounting for about 10% of BT's turnover. It is not valid to infer anything about the beta either for copper access or for the rest of BT from such a small portion of the whole group.

Going forward we do not believe that the copper access business will necessarily be lower risk than either the stock market as a whole or the rest of BT. In addition to the impact of relatively high fixed costs, a number of factors that may not be fully diversifiable by the copper access business (and therefore will be influences on its beta) are likely to increase risk over the foreseeable future, and these cannot be ignored. The impact of new access technologies (e.g. wireless local access, 3G mobile telephony) and, perhaps significantly, constraints imposed by regulation, will all have impacts on the exposure the copper access business has to market-driven risk, especially the risk of copper-based assets becoming stranded. Although this latter risk may not be directly related to beta, we believe that the regulatory regime should take this into account and allowing an upside in the cost of capital

would be a reasonable approach. In summary, there is some doubt that the equity beta for the copper access business should be lower than the market as a whole, and we believe the evidence does not support a significant difference between the equity betas for copper access and for the rest of BT.

We suggest that in the absence of substantive supporting evidence, Ofcom should assume that BT's copper access business has an underlying asset beta at least as high as the stock market as a whole. We believe that BT's gearing is higher than the stock market as a whole - using the market average asset beta (around 0.7 using a market gearing of 30% - which we believe to be at the upper end of estimates) for copper access would, at BT's current gearing of 35% result in an equity beta of around 1.1 or more.

#### Implications for cost of capital

We consider that a balanced and conservative interpretation of the wide range of evidence, suggests a group equity beta of at least 1.25 which, combined with even a "widespread disaggregation", indicates a copper access beta fairly close to that of the rest of BT, and a little higher than the market as a whole. Using a copper access beta of 1.08 this would give an overall cost of capital of between 10.9% and 11.4% for the copper access business, and between 11.6% and 12.2% for the whole of the Group.<sup>5</sup> (Our detailed calculations of these figures are given in answer to Question 12 below.)

#### C. Responses to specific questions

**Note:** For the avoidance of doubt, Questions 1 to 8 were raised by Ofcom in the first consultation on cost of capital, and BT's responses to those questions were submitted on April 5th 2005.<sup>6</sup>

Question 9: Do stakeholders agree that Ofcom should revise its central estimate of BT's equity beta downwards from 1.3 to 1.0, 1.1, or 1.2? Which of these figures is the most appropriate?

BT believes that there is insufficient evidence to justify reducing BT's equity beta from the level of 1.3 used by Ofcom as recently as September last year to anything lower than 1.25. The evidence of any larger change to BT's business risk only comes from an abnormal period for the capital markets, during which the lack of volatility is likely to deliver spurious and statistically uninformative results. The data gives conflicting (and unexplained) signals as it shows BT's beta rapidly decreasing on one measure, but rapidly *increasing* on two other measures at the end of the period. Given the uncertainty surrounding the data, and the trends which it shows elsewhere (see below), we believe data from the most recent part of 2005 should not be used as the basis for a medium- to long-term central estimate for the group beta, and hence the business risk of BT. Setting too low a cost of capital based on such imprecise and inconsistent evidence could result in a potentially serious regulatory failure.

The evidence relating to recent periods does not directly support any particular value for a forward-looking equity beta for BT as a whole, because of the uncertainty relating to

<sup>6</sup> See

<sup>&</sup>lt;sup>5</sup> Note that BT remains of the view, expressed in our response to the previous consultation on cost of capital, that the appropriate value for Equity Risk Premium is 5.0. Nothing in this response should be taken to mean that BT agrees with Ofcom's conclusions that the appropriate value is 4.5.

http://www.btplc.com/Thegroup/Regulatoryinformation/Consultativeresponses/Ofcom/2005/Costofcapit al/index.htm

apparent trends in the beta estimates and whether or not the data indicate a genuine material downward trend in BT's relative riskiness. The key objective for Ofcom should be to set a forward-looking cost of capital value that is likely to reflect BT's actual weighted average cost of capital in the next few years, so that there are sensible incentives on BT and other access network operators to both improve efficiency and invest in appropriate assets and technologies.

We have attached at Annex 1 a detailed critique of the analysis by the Brattle Group, and the underlying data, by Professor Ian Cooper of the London Business School. Professor Cooper has published extensively in this area and is one of the UK's experts in the field. His paper makes it clear that recent data is unlikely to be appropriate for drawing statistically meaningful conclusions. The lack of volatility in the stock market as a whole and problems with outliers in the data has resulted in beta estimates that are uninformative about underlying trends or relative risk levels.

Professor Cooper also points out many technical flaws in the new Brattle Group analysis and major inconsistencies with its previous (2004) analysis on the subject for Ofcom. Previously, the Brattle Group used daily data from the last calendar year, but now it advocates two years. A "Dimson adjustment" was rejected in 2004, but is now applied to the data. The statistical problems that the Brattle Group considered invalidated betas measured against a World stock index are now downplayed and the Group suggest that a World measure should be given some weight. Put simply, one of the two documents supplied by the Brattle Group must have serious shortcomings.

Perhaps of most concern in the 2005 Report is the Brattle Group's new preference for a twoyear data window, which is largely based on the stability of this measure (Brattle, page 10). But this stability does not apply to the most recent data and it is *only* calculations based on this recent data that give a beta estimate of about 1. Until January 2005, the two-year window indicated a beta of around 1.25 (roughly consistent with their 2004 estimate of 1.29) but in just two months this has fallen to around 1.0. As Professor Cooper says,

"The lowering of the estimate can be justified only by the recent period of instability. It is difficult to see how a change in beta arising entirely from a short period of high instability is justified on the basis of a period of stability that has ended."

A summary of the evidence on BT's beta on alternative bases is given in the Summary of Annex 1, and is reproduced below:

| Summary of the evidence on B1's beta |                  |       |         |          |  |  |  |  |  |
|--------------------------------------|------------------|-------|---------|----------|--|--|--|--|--|
| Estimated by                         | Data frequency   | Index | Period  | Estimate |  |  |  |  |  |
|                                      |                  | 1.3   |         |          |  |  |  |  |  |
| Updating evidence                    |                  |       |         |          |  |  |  |  |  |
| Cooper                               | Daily (One year) | UK    | 2004-05 | 1.1      |  |  |  |  |  |
| Cooper                               | Daily (Two       | UK    | 2003-05 | 0.9      |  |  |  |  |  |
|                                      | years)           |       |         |          |  |  |  |  |  |
| Brattle                              | Daily (Six       | UK    | 2004-05 | 1.4      |  |  |  |  |  |
|                                      | months)          |       |         |          |  |  |  |  |  |
| LBS                                  | Monthly          | UK    | 2000-05 | 1.4      |  |  |  |  |  |
| Cooper                               | Daily            | World | 2004-05 | 0.9-1.2  |  |  |  |  |  |

#### Summary of the evidence on BT's beta

Clearly, there are a large number of alternative estimates of BT's beta but the central issue is whether the further evidence from the Brattle Group justifies a reduction of a central view from 1.3 to 1.0. For this, virtually all the weight is, in effect, being put on data since February

2005, but no explanation is given anywhere as to why there has been such a rapid change when BT has not undergone any such change in the range of its activities or its financial structure. Professor Cooper shows that this period was abnormal by historical standards and that the most likely explanations are in shortcomings in the statistical techniques employed. These include the non-normality of the regression residuals and severe heteroscedasticity<sup>7</sup>. These statistical problems mean that the estimates are likely to be significantly biased and unreliable. In view of this, Professor Cooper considers that estimates based on recent data should not be given a high weighting and that, "there is no strong evidence to base a significant revision of the earlier beta estimate of 1.3".

There are many aspects of recent trends and variability in the calculated beta estimates that are not explained. For example, there is no explanation given for the rapid fall-off in the twoyear beta estimate from mid-February 2005 in Figure 2 of the Brattle Group paper, or the rapid upswing in the one-year beta estimate in the same figure from the same period and an even bigger upswing in the 6-month estimate. As the Brattle Group indicate (para 5.2 of their document) it is hard to believe that BT's equity beta could genuinely have fallen as rapidly as the analysis indicates. There have been no fundamental changes in the capital structure, commercial mix, operating environment or regulatory regime in the past couple of years that would explain a rapid reduction in relative risk.

Ofcom itself indicates, in relation to the risk-free rate (para 2.43), that it would be inappropriate to give too much weight to recent evidence, if there is doubt about its relevant for a forward-looking determination. We believe this same cautious approach should be taken in relation to estimates of BT's equity beta, but the weight given to the data should be adjusted to take account of the weakness of any statistical inference.

We therefore strongly believe that Ofcom, as an evidence-based regulator, should give little weight to the most recent data. The evidence is clear from a couple of graphs presented in the Brattle Group paper. Figures 2 and 7 (which replicates the data in Figure 2 but focuses on a narrower range of dates) give clear evidence of an underlying and consistent beta for BT of around 1.25. Figure 2 is re-presented below, with a horizontal line added at a beta of 1.25. Whilst this might not be a wholly "scientific" approach, any reasonable observer would conclude the same as we do, namely that, using the two year daily data points, there is a stable value that persists over an extended period, and that this value is around 1.25. The large body of detailed statistical analysis is useful background to this conclusion, but what really matters here is whether Ofcom's judgement matches what common sense tells us. Common sense strongly supports our conclusion that BT's underlying beta cannot have materially changed since Ofcom determined it at 1.3 only in September 2004, and that the **appropriate value to use for BT's forward-looking equity beta is at least 1.25**.

<sup>&</sup>lt;sup>7</sup> Both non-normality of the residuals and heteroscedasticity mean that standard beta estimation techniques like those employed by the Brattle Group are unreliable in terms of proving point estimates and that measure of the accuracy of the estimates are inaccurate.



## Question 10: What is the view of respondents of the standard of evidence used by Ofcom in this second consultation, when added to that outlined in the first consultation?

We welcome the clear desire on Ofcom's part to support their decisions with robust analytical evidence. However, we did not consider that the evidence included in the initial consultation provided a sound basis for a far-reaching change in the assessment of BT's business risk, and the additional analysis included by Ofcom in the second consultation also fails to provide robust support for the changes now being proposed. We briefly discuss both of these submissions below, with further, more detailed comments, made by Prof. Ian Cooper being provided in Annexes 1 and 2.

Ofcom's overall approach to the questions it has raised is to consider a wide variety of evidence, and then use judgement to determine a potential range for the parameters in question, before then choosing point estimates. BT agrees that, given uncertainty about any single data set, Ofcom needs to carefully consider a wide range of evidence in coming to a view for the range of BT's equity beta and to judge whether there should be any (and, if so, how much) disaggregation of the beta.

However, spreading the net widely should not mean that data of questionable value is given weight i.e. that the standard of evidence is allowed to fall. In this respect, we note for example that PwC claims, on page iii of their document, that *"conducting such analysis on less than perfect comparators is generally preferred to not conducting the analysis at all"*. This is, in our view, an inadvisable approach for an evidence-based regulator to embark on, as much depends on the extent to which comparators and other estimates used are *"less than perfect"*.

We consider that it would be wrong to place significant weight on results that are inconsistent or incomplete, or which have considerable statistical and economic uncertainty. We believe that a regulator, if faced with the quality of evidence presented in these two consultations, should conclude that it would, on the basis of the evidence presented by Ofcom and their consultants, be wrong to either change the equity beta or to disaggregate the beta by any significant amount.

#### Comments on the work done by the Brattle Group

As referred to above, we have provided in Annex 1 detailed comments on the Brattle Group paper by Professor Cooper of the LBS. He writes, *"I cannot understand the logic of the Brattle position"*. Using the Brattle Group's preferred two-year estimate, a change in less than 10% of the data changes the estimate by 20%, but this particular data window is preferred by the Brattle Group precisely because, they assert, it displays stability. In Professor Cooper's view, the level of instability indicates severe estimation problems caused by a period of abnormally low market volatility. A closer inspection of the data was made by Professor Cooper who asserted that it did not provide strong evidence on which to make a significant revision to the earlier beta estimate of 1.3. This is explained fully in the Annex.

We strongly believe that the Brattle Group, in taking a point calculation at a specific date without considering whether that data reflects an underlying or persistent characteristic, have been too quick to reach conclusions that do not reflect what the data is or is not able to reveal about BT.

#### Comments on the work done by PwC

The paper prepared by PwC on Ofcom's behalf is reviewed by Professor Cooper in Annex 2, where he concludes that there are a number of non-trivial problems with the quality of the analysis and the conclusions reached.

Professor Cooper considers that the time-series analysis should be ignored because of the extent of the econometric shortcomings including selection bias, omitted variable bias, measurement error bias, serial correlation, heteroscedasticity and a number of other data and estimation problems. He asserts that the cross-sectional analysis contains only one robust result, which is that the ICT beta is higher than other parts of the business but even here the extent of this is unclear from the evidence in the PwC paper, as the betas used are known to be overestimates of future betas. For example, as pointed out in Annex 2, there is not a single industrial or commercial company in the UK market with an *equity* beta estimated by LBS based on monthly data higher than 1.82, whereas PwC estimates the average *asset* beta based on monthly data for ICT businesses as 2.32.<sup>8</sup>

PwC also accepts that its analysis excludes considerations that may be of importance in estimating the true beta of copper access. For instance, in the first bullet point on page ii of the PwC document, it accepts that the copper access business may have higher operating gearing. However, this observation, which would increase the copper access beta, is then disregarded.

Although PwC highlight a small number of regulators that have attempted to disaggregate betas (section 3.4), it is clear from the evidence that the majority of regulators have *not* pursued this option. The few examples cited indicate that these regulators were unable to be anything other than general - phrases such as "likely to be" or "one could also argue" are not hard evidence. The "limited precedent" PwC refer to could be interpreted as evidence

<sup>&</sup>lt;sup>8</sup> Equity betas are affected by the extent of a company's gearing. The underlying asset beta is a measure of the "unlevered" risk of the company, and is lower than the equity beta. The asset beta is calculated using the relationship: equity beta = (asset beta)  $\times$  (1 + debt/equity)

that most other regulators have decided not to pursue disaggregation, either because there is insufficient evidence to support such a move, or because the adverse consequences of making an error of judgement are too significant.

Even PwC are tentative about the conclusions that can be drawn from the data as to whether copper access activities are less risky than the rest of BT, and their conclusions are not informative about the extent of any such difference in risk levels. While clear objective evidence from data analysis would have been welcome, it is dangerous and misleading to place significance on results that are subject to so many statistical shortcomings.

#### Inconsistency of approach

In addition, it is evident that there are inconsistencies between the data and the statistical analysis done by the Brattle Group and PwC and parts of Ofcom's consultation document. For example, PwC use revenues to weight different parts of BT, whereas Ofcom use Mean Capital Employed; the Brattle Group focus on daily data for calculating beta, and do not use weekly data, whereas PwC use weekly as well as daily data; the Brattle Group focus on relatively short periods for their analysis, whereas PwC have attempted to draw conclusions from data far older than two years. Whilst a multiplicity of data sources may be useful, it is important that they are used in consistent ways, to ensure that inconsistent conclusions are not drawn.

Question 11: Based on the available evidence, what do respondents think would be an appropriate level of disaggregation for the equity beta of BT's copper access network? Which of the following levels would be most appropriate: (a) 0.3 points below the group average; (b) 0.2 points below the group average; (c) 0.1 points below the group average; (d) 0 points below the group average?

It is highly likely that, in practice, respondents will find it difficult to express anything more than an opinion on this question – and Ofcom must expect others' views to be motivated to some extent by potential commercial advantage.

We have already commented in our answer to Question 10 above concerning the lack of evidence for a different equity beta for copper access activities compared with the rest of BT. There is only what one might characterise as generalised "intuitive" support for a lower equity beta for the copper access network (what Ofcom refer to as its *a priori* reasoning - in layman's terms this is ultimately little better than "gut feel"). However, this is not supported definitively by the factual evidence or by statistical inference. Ofcom's range of a differential in the beta values of between 0.1 and 0.3 is also entirely arbitrary.

We do not agree with Ofcom's assertion in paragraph 4.90 that the evidence for a lower equity beta for the copper access business is "compelling". If this were true there would have been consistency in the analysis done by PwC, and it would have been possible for PwC to be far more conclusive regarding the disaggregation of beta. In the event PwC were, despite the considerable amount of analysis and 58 pages of description of their work, unable to produce much more than further general conclusions that are no more than indicative, and even then Professor Cooper considers that the evidence is sometimes interpreted much more strongly than it warrants.

#### **Comparison with ICT companies**

The only substantive conclusion PwC reach is that BT's ICT activities are likely to have a materially higher beta than the rest of BT. Neither a specific value nor relative difference from the beta for the rest of BT can be supported by the evidence they present, and we remain doubtful that the range of possible betas is relevant. The sample chosen was small (only five comparators as per Table 1 on page 15 of the PwC paper), and although these companies operate in what is broadly described as ICT, it is by no means clear that they are

comparable either with each other or with BT's ICT activities. In addition, betas as high as those in Table 1 of the PwC Report are known to be overestimates of future beta which, as set out in Annex 2, commercial beta services such as Bloomberg and others adjust such rates downwards significantly<sup>9</sup>. Far more analysis would be needed before any useful conclusions could be drawn in this area. Furthermore one must question whether it is valid to use revenues to weight the ICT betas (para 3.1.6), bearing in mind that Ofcom has used Mean Capital Employed in its disaggregation calculations. Mixing the weightings is likely to result in confusion and inappropriate conclusions.

#### Role of fixed costs

Ofcom has reported that there is no consensus about whether it should estimate and apply a distinct equity beta for BT's copper access network. A number of reasons were suggested by respondents other than BT as to why this business might not be materially less risky than that for BT overall. One of these is that the access business might have a high operational leverage due to the prevalence of fixed costs. This would mean that volume changes might be expected to have larger profit impacts in the access business and hence be a source of systematic risk. Our understanding of this is that Ofcom is suggesting that these are the "wrong kind" of fixed costs - costs that are sunk as opposed to fixed with respect to volumes.

In fact, sunk costs are widely recognised to be a source of risk. Consumers can relinquish lines, including second lines, and in this case the sunk nature of many of the relevant costs will mean that the access business is prone to a material level of risk that is hard to avoid. It is, as Ofcom says, future cash flows that are relevant, but this does not mean that the irreversible nature of many access costs is irrelevant. Indeed, with almost universal uptake of mobile services providing voice connectivity, it is possible that for many consumers fixed lines may become a discretionary item - one that can be ceased in certain circumstances much like pay-TV. Telecommunications is increasingly a convergent industry, and past assessments of demand elasticities are unlikely to be a good guide to the future. Such an effect only needs to occur at the margin for it to have an impact; there does not need to be a mass cancellation of fixed lines, whether first or second, as the irreversible nature of costs ("fixed with respect to time") will then multiply the profit impact of a marginal reduction of lines. This contrasts with, for example, a retail business where lower sales can be offset by lower wholesale purchases after a short lag (that is, a lag much shorter than the 20-year economic life that Ofcom is considering using for copper access assets). Indeed, even an ICT-based business can react to a downturn more quickly than an infrastructure-based business.

#### Comparison with US telecommunications companies and UK utilities

We continue to believe that giving much weight to evidence relating to US telecommunications companies and UK utilities would be a mistake. Whilst we accept that there are some similarities between these companies and some parts of BT, the differences (e.g. scope/mix of activities, impact of non-regulated businesses, differences in regulatory regime) are significant, and the impact of these differences on relative or absolute beta values cannot be dismissed. In any case, there is sufficient uncertainty regarding the validity of any such inference to conclude that little or no weight should be placed on this source of evidence.

#### Comparison with the stock market as a whole

We recognise a degree of intuitive feasibility of Ofcom's *a priori* reasoning, notwithstanding the absence of definitive proof of that reasoning. However, any variation from a notional equity beta of unity for the copper access network (i.e. of its riskiness relative to the stock market as a whole, normalised for average gearing levels) should be small, taking account of

<sup>&</sup>lt;sup>9</sup> For example, the asset beta based on the LBS estimate of Logica's beta is 1.27 rather than the 2.14 reported by PwC in Table 1.

the weakness of the empirical and statistical evidence, and the need to be cautious as to potential adverse impacts of making a Type 1 error which Ofcom refers to in its second consultation.

In general technological advances will not result in systematic (non-diversifiable) risk. However, it is important to recognise that some risks associated with technology *are* likely to be non-diversifiable. For example, it seems likely that in the foreseeable future wireless (or perhaps powerline) local access will render some parts of BT's copper-based local access network redundant. It is even possible that investing in fibre access or extensions of existing cable networks may become economic. Although this may not directly be an issue relating to beta risk, the regulatory regime has so far not had to recognise stranding risks, and as a consequence regulated prices have not been set at levels that ensure BT is able to recover the cost of such assets. It is clear that no access technology, including copper, is a truly "natural" (i.e. permanent) monopoly, and allowing an additional element in the allowed return on capital employed, via the regulatory cost of capital, is the logical regulatory tool to use.

#### Normalisation of financial gearing

It is important to ensure betas are being properly compared. The equity beta of the stock market as a whole is, by definition, 1.0. The average gearing of listed companies is around 30% (or less<sup>10</sup>), whereas BT's gearing is currently around 35%. The underlying asset beta of the market as a whole is therefore around 0.7. Assuming BT's copper access activities share a similar asset beta, at the current gearing level of 35% the beta would be around 1.1 (our calculations derive a value of 1.08, which we have used in our calculations - for simplicity we have rounded this up in our narrative). Therefore, even if one accepted that BT's copper access business was as risky as the stock market as a whole, the appropriate equity beta to use would be around 1.1.

We believe that this is the proper reference point, and the minimum beta that should be applied to the copper access business.

The implied beta for the rest of BT is 1.36 at 35% gearing. This is consistent with Ofcom's views of what might be a reasonable range for beta for the rest of BT (per para 4.52).

## Question 12: What is the view of respondents on Ofcom's proposed estimates of the WACC for BT's copper access business and the rest of BT?

BT's view on the key parameters under consideration at this stage is set out above. Whilst this consultation does not request comment on the other parameters, we continue to believe that the Equity Risk Premium should be set at 5.0% - the evidence does not support a reduction from the rate used by Ofcom in September 2004. However, it appears that Ofcom has determined that a rate of 4.5% is to be used.

We have set out our views in summary below, comparing our position with that presented by Ofcom in the consultation document. The table uses a range of values for ERP between 4.5% and 5.0%, but our position remains that a value at the upper end of this range is appropriate.

<sup>&</sup>lt;sup>10</sup> Morgan Stanley reported an estimated 33% gearing in 2005 (down from 40% in 2002) - see http://business.telegraph.co.uk/money/main.jhtml?xml=/money/2005/07/03/ccbreak03.xml&menuld=2 42&sSheet=/money/2005/07/03/ixcoms.html This data used book values of debt. Using an average book-to-market ratio for debt of around 2 (per Florackis and Ozkan "Agency costs and Internal Governance Mechanisms: Evidence from UK firms", working paper, University of York (2004)) this allows us to estimate a gearing on market values of around 20%. Our conclusion is that BT's current gearing is higher than the market as a whole, although this data is indicative only.

|                                   | Copper access<br>business |                | "Rest of BT"    |                | Whole of BT     |                |
|-----------------------------------|---------------------------|----------------|-----------------|----------------|-----------------|----------------|
|                                   | High<br>gearing           | Low<br>gearing | High<br>gearing | Low<br>gearing | High<br>gearing | Low<br>Gearing |
| Risk-free rate                    | 4.7                       | 4.7            | 4.7             | 4.7            | 4.7             | 4.7            |
| ERP                               | 4.5 - 5.0                 | 4.5 - 5.0      | 4.5 - 5.0       | 4.5 - 5.0      | 4.5 - 5.0       | 4.5 - 5.0      |
| Equity beta                       | 1.08                      | 1.00           | 1.36            | 1.26           | 1.25            | 1.16           |
| Cost of equity<br>(post tax)      | 9.6 - 10.1                | 9.2 - 9.7      | 10.8 - 11.5     | 10.4 - 11.0    | 10.3 - 11.0     | 9.9 - 10.5     |
| Debt premium                      | 1.0                       | 1.0            | 1.0             | 1.0            | 1.0             | 1.0            |
| Cost of debt<br>(pre tax)         | 5.7                       | 5.7            | 5.7             | 5.7            | 5.7             | 5.7            |
| Corporate tax rate                | 30%                       | 30%            | 30%             | 30%            | 30%             | 30%            |
| Cost of debt (post tax)           | 4.0                       | 4.0            | 4.0             | 4.0            | 4.0             | 4.0            |
| Gearing                           | 35%                       | 30%            | 35%             | 30%            | 35%             | 30%            |
| WACC (post tax)                   | 7.6 - 8.0                 | 7.6 - 8.0      | 8.4 - 8.9       | 8.5 - 8.9      | 8.1 - 8.5       | 8.1 - 8.5      |
| WACC (pre tax)                    | 10.9 - 11.4               | 10.9 - 11.4    | 12.0 - 12.7     | 12.1 - 12.7    | 11.6 - 12.2     | 11.6 - 12.2    |
| BT's view of<br>WACC (pre-tax)    | 10.9% to 11.4%            |                | 12.0% to 12.7%  |                | 11.6% to 12.2%  |                |
| Ofcom's view of<br>WACC (pre-tax) | 10.1%                     |                | 11.5%           |                | 11.0%           |                |

#### Summary of BT's views:

If Ofcom was to set the cost of capital for copper access at their mid-point of 10.1% this would, given our view of BT's overall cost of capital, result in a range for the rest of BT of between 12.6% (with ERP at 4.5%) and 13.3% (with ERP at 5.0%). In summary we therefore conclude that BT's overall cost of capital should be set at the upper end of the range 11.6% and 12.2%, with the rate for copper access at the upper end of the range 10.9% and 11.4%.

#### Consequences of error

In view of all the unresolved issues which this consultation has generated, BT understands why Ofcom considers the effects of its making a Type I or Type II error, and we cautiously welcome such an approach. However, the assessment does not consider the impact on *all* stakeholders, not least the effect on shareholders of copper access providers including but not restricted to those of BT. Any bias towards consumers should not be a bias against those who have invested in the UK telecommunications market, even if their investments are now sunk and they cannot exit the market. There are a range of values that could be adopted for several parameters in the calculation of BT's cost of capital, and little certainty as to where the "right" place is on these ranges. It would be preferable for Ofcom to err on the upside, as the consequences of setting the cost of capital too low have potentially wide-reaching impacts on the development of telecommunications services in the UK.

Please note that the annexes, written on behalf of BT by Professor Ian Cooper, London Business School, are in a separate portable document format (PDF) file.

## Annex 1: Comments on the Brattle Group document "Beta analysis of British Telecommunications: Update" by Ian Cooper

Annex 2: Comments on the PwC document "Disaggregating BT's Beta" by Ian Cooper