

# Critique of BT's response to Ofcom's LLU and WLR price control consultation

## DUCT VALUATION

*In its response to the consultation, "Charge control review for LLU and WLR services"<sup>1</sup>, BT argued for an alternative approach to the regulatory valuation of duct that would result in prices being set above the level indicated by Ofcom's proposed methodology. In this paper, we critique BT's arguments and conclude that its suggested approach would not increase efficiency as argued by BT and that the arguments put forward by BT are not based on robust evidence.*

## Summary

For the purpose of determining the LLU and WLR price controls, Ofcom has proposed to value BT's ducts on the basis Current Cost Accounting ("CCA") with the so-called RAV<sup>2</sup> adjustment applied whereby:

- Pre-1997 assets are valued by indexing forwards historic costs ("Indexed HCA<sup>3</sup>"); and
- Post-1997 assets are valued on the basis of CCA.

BT makes a number of arguments as to why Ofcom's duct valuation is understated and that instead all assets should be based on a CCA valuation:

1. An immediate move to CCA will lead to greater economic efficiency

However, we conclude that given the high fixed costs in access networks there would be no benefit in terms of providing the correct build-buy signals to potential competitors and that, instead, Ofcom's objectives should be weighted towards predictability and cost recovery which are not met by CCA.

2. Investors since privatization have under-recovered duct costs<sup>4</sup>

BT has not set out why ensuring investors at privatization make a reasonable return compared to their expectations should be one of the objectives of a costing methodology. We find that BT has not provided a reliable estimate of investors' implied duct valuation at privatization (and, hence, the forward looking cash flows expected by investors). As BT itself indicates price

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<sup>1</sup> Charge control review for LLU and WLR services. Publication date: 31 March 2011

<sup>2</sup> Regulatory Asset Valuation

<sup>3</sup> Historic Cost Accounting

<sup>4</sup> Even before application of RAV adjustment

regulation prior to 1997 was based upon HCA, it is likely that this is the valuation methodology used for duct by investors purchasing shares, rather than the valuation retrospectively calculated by BT.

3. Even if calculating CCA estimates using an indexation approach were appropriate, the correct index to use would be the General Building Cost Index (“GBCI”)

In our view, GBCI does not appear to be a good proxy for the costs of duct installation. A better approach would be based upon specific duct cost information and, where this is not available, to use an index of unit labour cost inputs, adjusted by an efficiency assumption in line with the overall efficiency assumed for Openreach.

4. It would be inappropriate for post-1997 assets valued on an Indexed CCA basis to include a ‘national discount’

BT continues to apply a national discount to its direct CCA valuation in its Regulatory Financial Statements (“RFS”). In theory, the direct and indexation approaches should produce identical results prior to the application of the discount and, as such, it is inconsistent to apply the discount in one approach but not in the other. Moreover, applying the discount has resulted in accelerated first year depreciation of those assets that were purchased during the period that the discount was applied. Future valuations should reflect this accelerated depreciation in past years, in order to prevent BT over recovering its costs.

## CCA valuation

### The benefits of CCA valuation are limited for duct

CCA based costing approaches have been widely adopted for telecommunications price controls because, in certain circumstances, they can lead to more efficient outcomes. However, in this particular case, Ofcom may assess whether there are better alternatives, such as the RAV approach currently applied for pre-97 assets, for meeting the regulatory objectives of the price control. Below we analyse how CCA can enhance efficiency, in particular productive efficiency, in some contexts and how this is balanced against other considerations<sup>5</sup>. We then demonstrate that productive efficiency arising from

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<sup>5</sup> BT has not carried out such an analysis but simply asserts in paragraph 72 of its response that CCA provides the best solution for contestable markets and that duct may become contestable in the future.

potential market entry is not a material consideration that should be given significant weight here. Finally, we show that the costs and potentially loss of efficiency under a CCA approach are significant which, given the immaterial benefits it provides, suggests that it may not be the optimal approach for duct valuation.

### CCA can enhance productive efficiency in contestable markets

The main mechanism by which CCA approaches can enhance efficiency compared to other approaches is by sending the correct ‘build or buy’ signals to competitors or potential entrants in contestable markets.

If a competitor or entrant can deliver an increment of demand at a lower cost than the incremental cost to the regulated operator, then overall productive efficiency will be enhanced by the competitor/entrant delivering this increment. If the competitor’s costs are greater than the regulated operator’s incremental costs, then the competitor delivering this increment of demand would increase costs and diminish overall productive efficiency. Setting regulated prices at long run incremental costs (“LRIC”) should result in the competitor/entrant only choosing to deliver the increment of service if their costs are lower, hence, leading to a productively efficient outcome.

CCA approaches ensure that this fundamental ‘build or buy’ decision is not distorted by changes in asset prices over time, as could be the case with HCA approaches. For example, if prices of assets were falling over time, setting prices at HCA LRIC could result in competitors “building” rather than “buying” simply because current asset prices were lower than the historic prices used to set regulated prices, even if the competitor was less efficient in providing the increment than the incumbent. By setting regulated prices at CCA LRIC, the build-buy decision will not be distorted by changes in the price of assets over time and, hence, productive efficiency is enhanced.

### Taking account of other considerations

In practice, regulated prices are not set at a LRIC level, as to do so would mean that the regulated operator could not recover fixed and common costs which, given the scale of these costs in telecommunications networks, would discourage continued investment. Instead, regulated prices are generally set at LRIC plus a mark-up to recover certain fixed and common costs (LRIC+).

Applying LRIC+ prices in contestable markets could lead to competitors delivering some increments of demand even though their costs are above the incremental costs of the incumbent. This potential reduction in productive efficiency would be offset to a degree by the benefits in terms of dynamic efficiency through increased competition and providing the regulated operator with incentives for continued investment (which would be discouraged if they

were unable to recover fixed and common costs). Thus, a LRIC+ methodology may be efficiency enhancing overall compared to a LRIC approach.

In the case where fixed and common costs are a relatively small proportion of costs and, hence, the mark up is relatively small, productive efficiency will not be significantly affected by using LRIC+ (rather than LRIC). In the case where fixed and common costs are low and prices are based on LRIC+, using CCA rather than HCA will ensure that build and buy decisions reflect changes in asset prices over time. This may have a significant impact on overall efficiency - thus, it may be reasonable to base prices on CCA costing methodologies. Alternatively, where fixed and common costs are high (as is the case with duct), a move to CCA valuation (from HCA) is unlikely to deliver significant productive efficiency benefits as even competitors whose costs are significantly above LRIC would 'build' rather than 'buy', if their incremental cost was below LRIC+.

### Application to duct costing

When deciding whether CCA LRIC+ prices will enhance overall efficiency in the case of duct, we need to consider two factors:

- The degree to which the market is contestable; and
- The degree to which a CCA LRIC+ approach could result in an outcome which risks diminishing productive efficiency if the market were contestable.

This second factor will depend to a large extent on the relative size of the mark up, which in turn depends on the level of fixed and common costs in the network.

The document 'LRIC: Relationships & Parameters' which forms part of the documentation to BT's RFS provides an estimate of the incremental costs in the BT's local access duct network<sup>6</sup>. BT estimate the increment cost of the network is 3% of the total cost<sup>7</sup>. As LRIC+ estimates are set with respect to the total cost of the network, this indicates that the LRIC+ based prices set by Ofcom are approximately 30 times higher than LRIC. This very high level of fixed costs indicate that it might not be feasible for a potential entrant to compete with BT by replicating BT's network as they could not expect to be able to fully recover these fixed costs with an lower market share. Such entry would also increase the overall level of costs across the industry which would not enhance productive efficiency.

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<sup>6</sup> BT Group plc Long Run Incremental Cost Model Relationships and Parameters 2011. Appendix 2, CV label CV003, CV name Duct: local access

<sup>7</sup> The value of the CVR at 0% of demand is estimated at 97% indicating that only 3% of costs are variable with respect to demand.

Given this very large difference between LRIC and LRIC+, competitors using other technologies whose incremental costs are significantly above those of BT's, but below the LRIC+ level, could still profitably compete with BT. Such competition will reduce overall productive efficiency as BT's avoidable costs due to the reduction on demand on its network will be much smaller than the corresponding incremental cost for the competitor, even in the long run. If Ofcom were to set prices in order to ensure any competition was efficient in terms of minimising the overall costs of delivering service across the market, they would have set prices close to LRIC, rather than the much higher LRIC+ level. From this we can see that when setting prices at a LRIC+ level Ofcom must have attached less weight to the need to send the correct productive efficiency maximising 'build or buy signals' and greater weight to the need to ensure BT makes a reasonable return. This has allowed Ofcom to depart from a CCA approach with the reason given being the limited prospect of competition in fixed access markets in the medium term.

BT argue that the market may be contestable in the medium term and that Ofcom should place greater weight on setting prices that send the appropriate build or buy decision to competitors. As shown above, placing greater weight on appropriate build or buy decisions would require prices moving towards a CCA LRIC level rather than the CCA LRIC+ level which BT advocates. According to BT's own data CCA LRIC for duct is approximately 3% of the CCA LRIC+ level. The current RAV adjusted LRIC+<sup>8</sup> prices are still considerably above prices that would be set based upon CCA-LRIC without any mark up for fixed and common costs. Thus, if Ofcom were to give greater weight to productive efficiency, this would suggest a **reduction** in regulated prices rather than an increase as BT is arguing.

### Other potential benefits of CCA

Under a HCA approach, prices will tend to be higher in real terms when assets are relatively recently purchased but then decline as the assets' age increases as the costs of assets will not be adjusted for the change in the purchasing power of money. This could lead to demand being relatively lower when assets are relatively new. A CCA approach, in implicitly taking account of general inflation, could enhance allocative efficiency by ensuring that end user prices remain broadly stable in real terms, compared to an HCA approach.

However, an indexed HCA approach, as used in the RAV calculation, can meet this objective more reliably and predictably than a CCA approach based on replacement cost.

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<sup>8</sup> RAV is a mix of HCA and CCA.

## Costs of a CCA approach

Duct assets are amongst the longest lived assets in telecommunications network, with asset lives typically determined by regulators to be of the order of 40 years, although there is considerable variation in assumptions. The asset base is also by its nature a continuous network not a collection of discrete components. For example when a section of duct is replaced, it may not be possible to identify which, if any, part of the existing duct asset has been retired.

The asset valuation largely relates to the capitalised labour costs involved in installing and maintaining the duct network, rather than the underlying physical inputs, which also increases the difficulty of assigning value to individual assets. A single entry in the asset register for capitalised labour costs may be related to installation and maintenance activities across a range of duct assets.

The long lived and complex assets underlying the duct network means that direct CCA valuations are uncertain as has been demonstrated by the repeated changes in methodology/sample by BT leading to changes in valuation (see **Table 2** below).

This uncertainty will increase costs for competitors, as the uncertainty in the future level of wholesale and retail prices will lead to increase risk to investors. Investor will wish to be compensated for this increased risk through higher returns both increasing prices and potentially limiting investment, reducing the benefits providing by downstream competition.

BT will also have an incentive to attempt to exploit the uncertainty and subjectivity inherent in valuing the duct network in a way which will maximise shareholder returns at the expense of customers. This places an increased regulatory burden on Ofcom to ensure that prices are appropriately set.

The uncertainty underlying CCA based estimates of duct suggests that rather than moving towards using a CCA valuation for pre-97 assets (by removing the RAV adjustment), Ofcom could be considering moving towards more robust and predictable bases such as indexed HCA (for all assets) or Infrastructure Renewals Accounting.

## Conclusion

Even if Ofcom were to accept BT's assertion that there was a possibility of competition in the provision of duct in the medium term, this would not imply the need to remove the RAV adjustment. Indeed, as removal of the RAV adjustment would move prices away from the optimal level required to ensure productively efficient entry (i.e. CCA-LRIC), and, therefore, an increased likelihood of competition is actually an argument for maintaining the RAV adjustment, not removing it.

## BT's investors valuation of duct pre-1997

In its response, BT presents an approach to regulatory price setting which rests on the assumption that investors at privatization should be “adequately compensated”<sup>9</sup> and able to recover the market value of BT at that point from future allowable revenues. In particular, it argues that the allowable revenues from duct in the period since privatisation should reflect the shareholder’s implicit valuation of duct at privatisation. BT asserts that while a charge based on CCA would lead to an “under recovery of costs”<sup>10</sup> on this basis, a charge based on HCA/RAV would lead to an even greater under recovery of costs.

Such an approach to regulatory price setting is not justified in this charge control as it:

- Would provide inappropriate incentives to shareholders;
- Would lead to a windfall gain to shareholders over the life of the relevant assets;
- Requires a decomposition of market valuation at privatization which cannot be estimated with any degree of reliability; and
- Does not appear to reflect the rational expectations of shareholders on the valuation of duct in the post privatization period.

### Setting prices based on market valuations results in inappropriate incentives

There is general acceptance that regulators should determine prices such that investors can expect to be able to recover efficiently incurred capital expenditure over time, including a reasonable cost of capital employed in funding the expenditure. This provides assurance to investors that they have a reasonable expectation of a reasonable return on future investments and thus provides an incentive to continue to invest, which brings benefits to consumers. Regulatory cost methodologies, including CCA, RAV and HCA based methodologies, attempt to ensure that the allowable revenues for an asset discounted back to the point of purchase equals the acquisition cost of that asset.

Unlike the acquisition of fixed assets, transactions in the securities of a regulated company such as share trades at privatization do not bring direct benefits to customer of that company. BT has not clearly set out the mechanism through which setting regulated prices with regard to the prices at which shares traded at privatization would benefit customers.

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<sup>9</sup> Paragraph 115 of the BT response

<sup>10</sup> Paragraph 114 of the BT response



Setting future price regulation based on the price at which shares were traded could result in a harmful circularity where increased market valuations would lead to increased prices, leading in turn to increased valuation. This incentive to bid up the market valuation would result in a transfer of wealth from customers to shareholders with no benefits in terms of incentives for capital investment. There would also be clear reductions in allocative efficiency as prices would be set above the efficient level required to ensure continued investment in the network leading, reducing demand.

### BT's approach leads to over-recovery over the lifetime of the assets

Even if it were appropriate to focus on transactions between investors rather than the regulated operator's purchases of assets, it is unclear over which time period investors' returns should be measured. As shareholders are continually trading shares, it makes little sense to consider 'investors' returns from a fixed point in which a portion of shares change ownership, as there may be no consistent set of investors who are a shareholders over a given period. This contrasts with the measurement of returns for assets over the lifetime of the asset from acquisition to retirement.

BT's analysis focusses on the period from the initial partial privatization in 1984 until the point at which all 'pre-1997' assets are fully depreciated, which given the 40 year life of the assets will occur in 2037. It argues that an investor acquiring the duct network at the value BT estimates based on the privatisation share price, followed by cash flows from these assets equal to allowable revenues estimated on the regulatory basis in use at each period, would not make a reasonable return even if prices were set on a CCA basis in the future. Based on this methodology continuing with the lower indexed HCA allowable revenues resulting from applying the RAV adjustment will result in an even greater "under-recovery".

From the more traditional approach of measuring returns over the lifetime of assets, HCA based allowable revenues over the life of assets would result in normal returns<sup>11</sup> with the total depreciation charge equal to the existing cost of acquisition and the allowance for the cost of capital providing a return equal to the determined cost of capital. This means that, were this purported under-recovery to have occurred post privatization, then it can only have been balanced by an over-recovery in the period prior to privatization, i.e. there was a windfall gain for the Government (as shareholder) at the point at which it sold its shares.

If this were the case, resetting prices (raising prices) such that a post privatisation shareholder would make a normal return on their investment while the government pre-privatisation over-recovered would effectively lead to a windfall

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<sup>11</sup> i.e. the discounted value of allowable revenues at the time of acquisition of assets equals the cost of the assets



profit to shareholders overall. Thus, shareholders as a whole over the lifetime of the network would make returns above the level required to ensure capital investments are made, at the expense of consumers. There is little reason to think that there would be offsetting benefits to consumers, for example by incentivising efficient future investments as, unlike ongoing capital expenditure, the privatization of BT will not occur again. Indeed the change in regulatory approach suggested by BT would if anything increase regulatory uncertainty by discouraging future investments

### BT's decomposition of the market valuation at privatization is not robust

BT's 1984 share prospectus provided balance sheet information on both a HCA basis consistent with the statutory financial information and on a CCA basis, with fixed assets value at Net Replacement Cost<sup>12</sup> (NRC). The CCA estimates were based on applying internal price indices to the historic acquisition cost of the assets<sup>13</sup>. The implied market valuation of BT at the time of privatization, as estimated by BT, lies somewhere in between the HCA valuation and the CCA valuation made at the time.

BT estimates the implied valuation of duct at privatization by the following steps:

1. An estimate of the net replacement cost of duct is estimated using assumptions on the price movements between acquisition of assets and the date of privatization. These are then applied to the historical time service of capital expenditure on duct, adjusting for accumulated depreciation;
2. The market enterprise value (EV) for BT at privatization is estimated by adding the market equity value (shares in issue multiplied by the share price) to the book value of long term debt;
3. The ratio EV to NRC is calculated for BT as a whole at privatization using the NRC for fixed assets, as reported in the privatization prospectus;
4. The ratio EV to NRC for BT as a whole is then applied to the estimated NRC for duct assets to estimate the implied market valuation of duct by BT's investors.

Since BT's market enterprise value was lower than the published NRC for BT as a whole this effectively applies a discount to the estimated NRC of ducts. This approach to estimating the investors implied duct valuation is fundamentally flawed for a number of reasons:

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<sup>12</sup> The estimated replacement cost of the business adjusted for cumulative depreciation to date. An estimate for NRC for BT as a whole was published in the BT 1984 share prospectus.

<sup>13</sup> Page 44 of the BT 1984 share prospectus.

- Accounting approaches, whether HCA or NRC, take no account of some intangible assets such as brand value relating to other parts of the business which will be taken into account when arriving at a market enterprise value. Applying a discount to the NRC of fixed assets which does not adjust for these intangible assets will overstate investors valuation of the fixed assets, and so will overestimate the value of duct;
- It assumes any “discount” to NRC was evenly distributed across all assets in proportion to NRC, which is inconsistent with the profitability of the different BT regulated businesses post privatization; and
- It is based on BT’s current estimates of duct NRC at privatization which are likely to have a high degree of uncertainty attached to them and are unlikely to be consistent with the NRC estimate for the whole of BT.

### *Market valuations are not directly based on the book value of fixed assets*

Market enterprise valuations do not solely reflect the book value or replacement cost of fixed assets but should reflect the expected discounted cash flow generated by the business as a whole. In the case of BT, the enterprise valuation at privatisation would reflect to some degree the investors’ expectation of the regulatory valuation of the network but also a range of other issues including:

- Cash flows from non-regulated businesses supported by intangible assets such as partial ownership of the Cellnet mobile licence, the installed customer base, BT’s brand, etc. ;
- Variation of returns for regulated services around the cost of capital. Even under mature RPI-X price cap regimes, some variation in returns is expected, for example due to operators making efficiency gains at a rate faster than that forecast when setting the cap. The variation in returns for price cap in place at privatization was not set explicitly with respect to a regulatory asset value<sup>14</sup>, on either a CCA or HCA basis, and had limited coverage, for example excluding international calls<sup>15</sup>.

These factors could partially explain the apparent difference between the market valuation and net replacement cost or net book value.

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<sup>14</sup> CRI PROCEEDINGS 31: THE UK MODEL OF UTILITY REGULATION contains a discussion of how the X factor was set.

<sup>15</sup> Page 14 of the 1984 Share Prospectus

*Any premium to book value or discount to replacement cost will not be evenly distributed across assets*

To the extent that investors would attempt to decompose the value of the business at privatization, they were likely to assign a relatively higher value to those parts of the regulated business that were judged to be generating higher returns<sup>16</sup>. At the time of privatization prices were extremely unbalanced with some activities, such as the international call business, being highly profitable and others such as line rental prices making losses. For example, OfTel presented the following estimate of profitability of different services on an HCA basis (after a period of partial rebalancing):

**Table 1. BT Return on Capital Employed (HCA) by Regulated Services**

|                                | 1990/91 | 1991/92 | 1992/93 | 1993/94 |
|--------------------------------|---------|---------|---------|---------|
| <b>Access</b>                  | (10.6%) | (11.1%) | (9.0%)  | (6.1%)  |
| <b>Inland calls</b>            | 54.6%   | 48.9%   | 44.7%   | 46.9%   |
| <b>International calls</b>     | 72.8%   | 61.4%   | 53.0%   | 53.9%   |
| <b>Directory enquiry calls</b> | n/a     | (23.1%) | (10.5%) | (7.5%)  |
| <b>Private circuits</b>        | 11.8%   | 12.3%   | 9.7%    | 17.0%   |
| <b>Total price controlled</b>  | 22.4%   | 19.5%   | 17.8%   | 19.2%   |

Source: BT's Financial Results By Service as reported in OfTel consultation: Pricing of telecommunications services from 1997 - Controls and Consultative Document on BT Price Interconnection Charging

Therefore, it is likely that the implicit shareholder value of duct, which is mainly used to deliver access services would tend to have a discount to its book value even if the BT regulated business as a whole was valued at a premium to book value, reflecting the supra-normal profits being earned overall.

*BT's calculation of NRC for duct is likely to be unreliable*

Due to the complexity of the duct asset base, current valuations of the duct network are likely to be subject to a high degree of uncertainty on a forward looking basis. This is reflected in the numerous methodological changes BT has

<sup>16</sup> To the extent that any higher returns did not reflect systematic risk attached to these activities.

made to duct valuation to attempt to produce an accurate estimation and the BT's failure to produce estimates that are consistent with the time series of expenditure and reasonable price trends shown in **Table 2**. It is likely the estimates made currently of NRC in 1984 are of limited reliability and may be inconsistent with the NRC for the business as a whole reported in BT's 1984 share prospectus. Thus any estimate of investors' implicit valuation of duct based on this information is likely to be inaccurate, even if BT's assumptions hold.

### Expectations of shareholders at privatisation

BT's approach implicitly assumes that shareholder expectations at the time of privatisation were that price regulation would be based on a duct valuation above HCA values. However, in the period following privatisation and in almost all subsequent periods except 1997 – 2004 BT suggests<sup>17</sup> that the corresponding duct assets were valued for regulatory purpose on an HCA basis. Whilst it is difficult to determine the expectations of investors at 1984 it is inconsistent for BT to argue that at privatisation shareholders expected regulated prices to be set based on a regulatory duct valuation above HCA book value while the actual regulated prices at the time and for the next 13 years were set based on HCA.

### Conclusion

BT has not fully explained why setting prices to take account of investor's valuations at privatization, even indirectly, would produce economic benefits. Even if Ofcom were to accept BT's rationale that prices should take some account of investors' valuations at privatization, the evidence and methodology used by BT to estimate an implied duct valuation does not appear to be robust. As regulated prices were set with reference to HCA costs during and for a number of years after privatization, this would appear to be a better indicator of investors' expectations than an estimated decomposition of the enterprise value made 27 years after privatization.

### Price information for indexation

Due to the issues with the direct valuation approach used by BT in the RFS, in particular the inconsistency of the resulting valuation with the historical data on capex and any reasonable estimate of price trends<sup>18</sup>, Ofcom favour an indexation approach to calculating CCA outputs.

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<sup>17</sup> Table 2 in Openreach response to the Ofcom consultation dated 31 March 2011

<sup>18</sup> As illustrated in figure A5.6 Project of replacement cost for post-1997 duct of the consultation

However, it is not clear what the appropriate price index should be as there is no publicly available price index that is directly relevant to duct. Potential approaches would appear to include:

- General cost/price indices which may be reasonably believed to provide a proxy for movements in duct prices;
- A proprietary index constructed based on actual prices paid by BT.
- Indices of movements in input costs, adjusted for assumed efficiency gains;

### GCBI Index

Ofcom's analysis in the Consultation document was based on the General Building Cost Index<sup>19</sup>. However it appears that this index is based on the cost of constructing buildings. There are a number of reasons why this may not be a reasonable proxy for movements in duct prices.

In particular a greater proportion of the costs of buildings are likely to be materials due the relatively high complexity of buildings, while the main materials input to the construction of duct - PVC ducting - will be a relatively small proportion of the overall costs. Movements in commodity prices could result in the price changes for materials differing substantially from changes in unit labour costs. In addition construction of buildings will require a range of specialised labour activities for which the wage costs movements, and efficiency gains may differ from the smaller group of labour activities required to install duct. For example, duct cost efficiency gains would be affected by the use of micro-trenching techniques but the cost of constructing buildings would not. Alternatively, the cost of building construction might be affected by new techniques such as pre-fabrication.

Thus, it is not clear that the GCBI is a suitable proxy for cost movements in duct installation.

### Unit cost information available to BT

Ideally, the source data for the revaluation index would be based on the actual unit costs paid by BT for duct. Raw data on unit costs has been used to produce the direct valuations using the methodology set out in the Detailed Valuation methodology and it should be a relatively simple task for BT to construct a weighted index based on these unit costs and weights based on a representative sample of the volume of assets. As only assets purchased after 1997 need to be valued on a CCA basis there would be no need to estimate price movements prior to 1997. The calculation could be less complex than those underlying the

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<sup>19</sup> Paragraph 3.71 of the consultation

current Direct Valuation as it would not be necessary to estimate the total volume of assets. The accuracy of the input volume of assets used for the weights would be less critical than the volume inputs used for the direct valuation.

It is unclear why BT have not proposed producing such an index at least since 1997, but instead seek to use external indices which by their nature will only at best proxy price movements in the underlying assets.

In theory, implied price movements in duct could be derived from the CCA outputs in the RFS, by adjusting changes in valuation for depreciation and disposal and acquisition of assets. The residual change in valuation should be equal to changes in price, along with any changes in volumes due to methodological changes. Such an implied price index is output by the RAV model. In practice, as shown in the table below, there have been numerous changes in duct valuation methodology, coverage of the sample of asset used to construct volume estimates. This means that the residual changes cannot be solely ascribed to price changes and as such the implied price index is unreliable.

**Table 2.** Changes in BT's Local Duct CCA Valuation Methodologies

| Period               | Source of volume information  | Sampling approach  | Price information   |
|----------------------|---|--|---|
| <b>1997?-2006/07</b> | Local Line Costing Study (LLCS) grossed up to Access Management Information System (AMIS) | Sample of 40 of the 176 available exchange areas (out of 5600 population) with half of the sample replaced each year   | Contract costs are supplied by BT Strategic Procurement. These are used in conjunction with 1994/95 rates indexed forward to derive the unit installation costs.  |
| <b>2007/08</b>       | Physical inventory for planning & e-records (PIPeR)                                       | Data from only 192 completely converted exchanges was available at y/e and although this was larger than the sample used in the LLCS, as it was not random, manually extracted data on a further 36 smaller exchanges was added, increasing the sample to 228 exchanges.   | <p>The materials cost of the duct itself (or its nearest modern equivalent), based on current contract prices, and the cost of installation.</p> <p>BT standard man-hour and stores item rates are obtained and contract costs are supplied by BT Procurement.</p> <p>The current contract rates reflect existing volumes of work which are of a relatively small volume and of a reactive nature due to BT's mature network structure. Consequently these rates are higher than would be expected if a large scale installation programme were in hand and have been discounted to compensate for this.</p> <p>A 45% discount was applied.</p> |
| <b>2008/09</b>       | Physical inventory for planning & e-records (PIPeR)                                       | <p>Data from 286 completely converted exchanges was available (i.e. 25% increase);</p> <p>The national "grossing up", from sample data to an estimate for the whole population of exchanges, was performed differently – once for exchanges in London and once for exchanges outside London (NB. In 2007/08 the number of London</p> | As 2007/08.   |



|                |   |   |  |
|----------------|---|---|--|
|                |   | exchanges was not statistically significant in the sample and therefore no correction for any associated bias was necessary).                     |  |
| <b>2009/10</b> | Physical inventory for planning & e-records (PIPeR) | Data from 769 completely converted exchanges was available (i.e. 169% increase); and  | Revised contract cost information from national purchasing agreement with revised 'national discount' of 14.5% |
| <b>2010/11</b> | Physical inventory for planning & e-records (PIPeR) | A sample of 300 completely converted exchanges were selected using stratified random sampling from the 1900 for which data had now been collected | As 2009/10   |

Source: BT Detailed Valuation Methodology Documents 2006 to 2011

### Efficiency adjusted input costs

Given the absence of either a reliable external price index or the apparent inability of BT to produce a price index based on its own unit costs, the most appropriate approach would appear to be a cost index of the most important cost inputs adjusted by an assumption of efficiency improvements. The cost of labour could be proxied by a labour cost index reduced based on an assumed efficiency rate, for example based on the BT's average rate of labour efficiency gains. Such an approach could be calibrated against any price movements that BT is able to provide information on, for example the significant reduction in unit installation costs following the move to a national purchasing deal.

- **National discount**

#### Equivalence of direct and indexation methods

BT applies a 'national discount' in its calculation of the direct CCA valuation in the Regulatory Financial Statements, arguing for productive efficiency reasons it is necessary to reduce the CCA valuation of duct to a level consistent with a hypothetical operator rolling out a full national network.

Ofcom has shown that the direct approach to valuation employed by BT in the RFS is inconsistent with past capital expenditure and any reasonable view of

historic price trends<sup>20</sup>. Ofcom in its alternative estimation of the appropriate duct valuation based on an indexation method has also applied a ‘national discount’ consistent with BT’s approach (i.e. 14.5% reduction).

BT argues that the national discount applied to date under a direct valuation approach is correct but asserts that such an approach would lead to an under-recovery under an indexation approach<sup>21</sup>. However, the direct and indexation methodologies should, in theory, produce the same outcome (before any national discount) and, as such, if a discount is appropriate under a direct methodology then should be under an indexation approach.

BT has continued to apply a national discount factor in the recently published RFS for the year to March 2011. We can see no explanation based on economic principles for arguing that such an approach when applied for price control purposes will lead to under-recovery of costs while continuing to apply a national discount in the RFS.

### Impact of national discount on allowable revenues

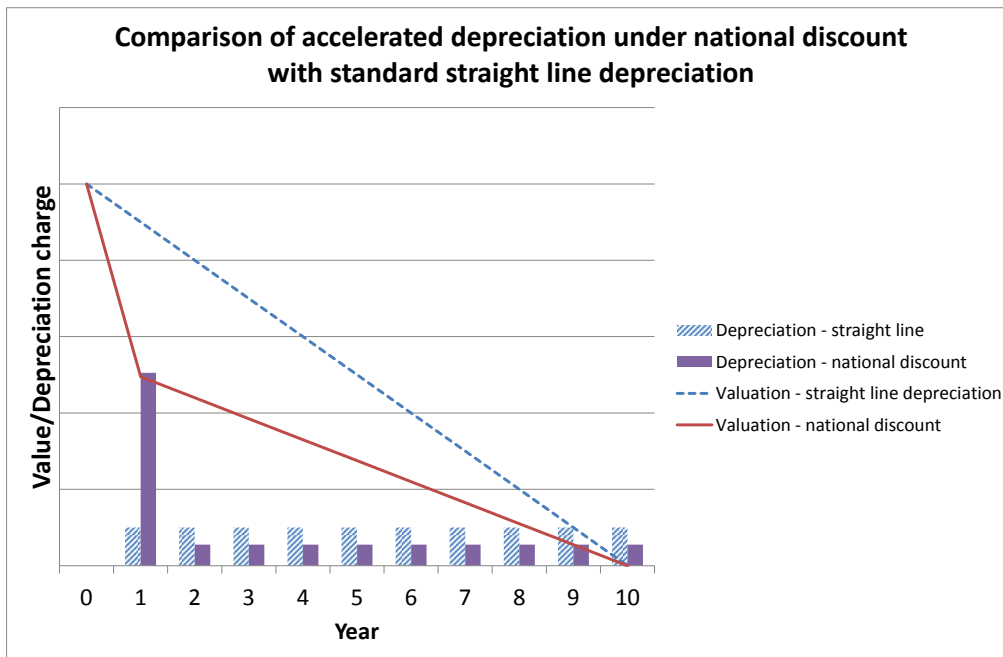
Under a financial capital maintenance (“FCM”) approach, variations in the valuation methodology change when costs are recovered but should not affect the overall cost recovery if they are applied consistently over time. Thus continuing to apply a national discount should not lead to under-recovery as asserted by BT, but a removal of the national discount could lead to under- or over-recovery.

Since its introduction, the national discount is applied across all assets at the end of each financial year, including those purchased in the year. Thus, assets purchased in the year are re-valued as the cost of acquisition, less depreciation and price changes since acquisition, less the national discount factor. After the year of acquisition, assets are depreciated on a straight-line basis based on the discounted value of the assets. Figure 1 below compares the results of applying a national discount with standard straight line depreciation.

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<sup>20</sup> As described in annex 5 of Ofcom’s consultation document

<sup>21</sup> Paragraph 145 of BT’s response

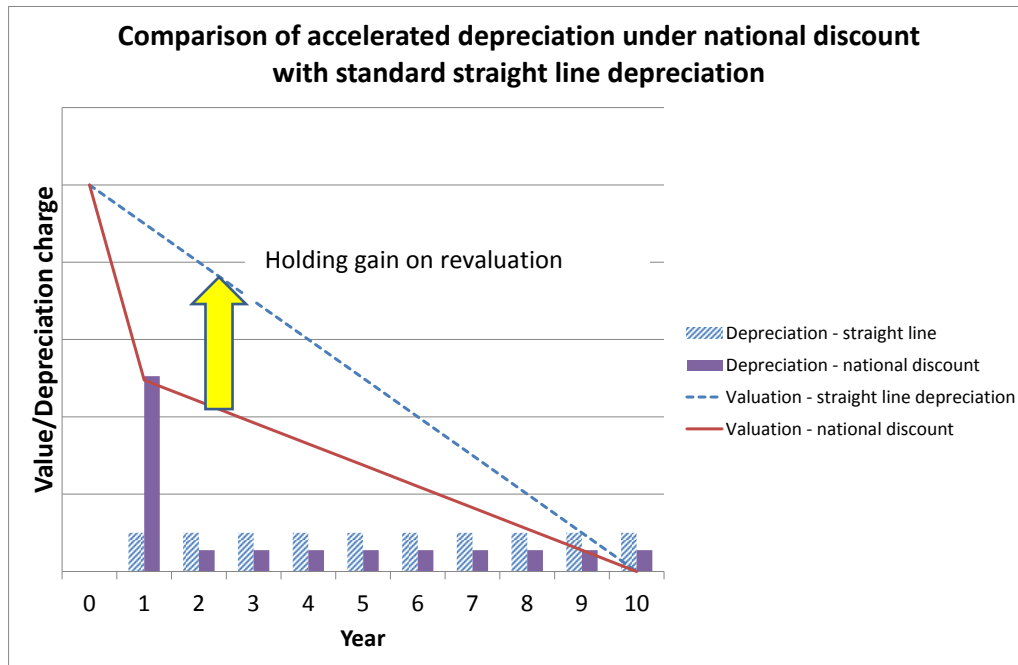
**Figure 1. Illustrative Impact of National Discount**

Under a financial capital maintenance approach<sup>22</sup>, this accelerated depreciation results in an increased depreciation charge in the first year of the asset life, effectively bringing forwards cost recovery from later years. The lower depreciation charges and cost of capital in later years offset the accelerated depreciation in the first year so that the NPV of the future allowable revenues at the time of acquisition is equal to the acquisition cost.

A change in methodology to remove the ‘national discount’ for assets previously valued on this basis would result in a holding gain for BT, as the valuation would be increased as illustrated in figure 2. Effectively, BT would benefit from the greater cost recovery in the first year but this would not be fully offset by lower allowable revenues from the point of revaluation. The resulting series of allowable revenues, when discounted back to the acquisition date, would be greater than the cost of acquisition – an over-recovery of costs.

<sup>22</sup> Under FCM any changes in value of assets, whether due to depreciation or to revaluation of the assets, are charged to the profit and loss account and as such are directly included in allowable revenues.

**Figure 2.** Illustrative Impact of withdrawal of National Discount on existing assets



## Conclusion

There is no economic rationale for a different application of a national discount factor between the BT's RFS and any CCA estimates used as an input to the price control.

Even if a national discount was not applied on a forward looking basis to new assets, it would be necessary to continue to apply the adjustment to existing assets in order to prevent over-recovery of costs by BT.

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